REGISTRATION REPORT
Part A

Risk Management

Product code: VP-LF/5 (Menno Florades)

Active Substance: Benzoic acid 90 g/L

COUNTRY: Germany

Northern, Central and Southern Zone
Zonal Rapporteur Member State: Germany

NATIONAL ASSESSMENT

Applicant: MENNO Chemie-Vertrieb GmbH

Date: 01/08/2017

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PART A – Risk Management

This document describes the acceptable use conditions required for the re-registration in Germany of VP-LF/5 (MENNO Florades) containing benzoic acid in Germany. This evaluation is required subsequent to the inclusion of benzoic acid on Annex 1.

The risk assessment conclusions are based on the information, data and assessments provided in Registration Report, Part B Sections 1-7 and Part C and where appropriate the addendum for Germany. The information, data and assessments provided in Registration Report, Parts B includes assessment of further data or information as required at national registration in Germany by the EU review. It also includes assessment of data and information relating to VP-LF/5 (MENNO Florades) where that data has not been considered in the EU review. Otherwise assessments for the safe use of VP-LF/5 (MENNO Florades) have been made using endpoints agreed in the EU review of benzoic acid.

This document describes the specific conditions of use and labelling required for Germany for the re-registration in Germany of VP-LF/5 (MENNO Florades).

Appendix 1 of this document provides a copy of the final product authorisation Germany.

Appendix 2 of this document is a copy of the approved product label for Germany
The submitted draft product label has been checked by the competent authority. The applicant is requested to amend the product label in accordance with the decisions made by the competent authority. The final version of the label has to fulfil the requirements according to Article 65 of Regulation (EC) No 1107/2009 and Regulation (EU) No 547/2011.

Appendix 3 of this document contains copies of the letters of access to the protected data / third party data that was needed for evaluation of the formulation.
Letter(s) of access is/are classified as confidential and, thus, are not attached to this document.

1 Details of the application

1.1 Application background

This application was submitted by DHD consulting (and where relevant include ‘on behalf of MENNO Chemie-Vertrieb G,bH) on 18 December 2013. A correction of the application was submitted on 16 September 2014.

The application was for approval of VP-LF/5 (MENNO Florades), a soluble concentrate (SL) containing 90 g/L benzoic acid for use as a as a as disinfectant of surfaces in protected areas (e.g. greenhouses, culture rooms, storage and processing rooms).

1.2 Annex I inclusion

Benzoic acid was included on Annex I of Directive 91/414/EEC on 01/06/2004 under Inclusion Directive 04/30/EC and has been deemed to be approved under Regulation (EC) No 1107/2009, in accordance with Commission Implementing Regulation (EU) No 540/2011, as amended by Commission Implementing Regulation (EU) No 541/2011 and Commission Implementing Regulation (EU) No 823/2012.

The Annex I Inclusion Directive for benzoic acid provides specific provisions under Part B which need to be considered by the applicant in the preparation of their submission and by the MS prior to granting an authorisation.

For the implementation of the uniform principles of Regulation (EU) No 546/2011, the conclusions of the review report on the benzoic acid, and in particular Appendices I and II thereof, as finalised in the Standing Committee on the Food Chain and Animal Health on 28 November 2003, shall be taken into account. In this overall assessment no particular issues have been identified as requiring short term attention from the Member States

1.3 Regulatory approach

Commission Implementing Regulation (EU) 2016/2016 (1) extended the approval period of benzoic acid to 31 January 2018 in order to allow the renewal process to be completed before the expiry of the approval of that substance. However, given that a decision on renewal has been taken ahead of this extended expiry date, this Regulation should apply from 1 September 2017.

This application was submitted in order to allow the re-registration in Germany of an already authorised product in Germany in accordance with the above.

1.4 Data protection claims

Where protection for data is being claimed for information supporting registration of Menno Florades, it is indicated in the reference lists in Appendix 1 of the Registration Report, Part B, sections 1, 5, 6 and 7 and Part C.

1.5 Letters of Access

This point is not relevant. The applicant submitted all necessary data.

2 Details of the authorisation

2.1 Product identity

Product code	VP-LF/5
Product name	MENNO Florades
Authorization number (for re-registration)	034407-00/00
Function	disinfectant (bactericide, fungicide, virucide and viroicide)
Applicant	MENNO Chemie-Vertrieb GmbH
Composition	90 g/L benzoic acid
Formulation type	soluble concentrate [Code: SL]
Packaging	1.0 and 2.0 L HDPE bottle, 10, 20 and 30 L HDPE jerry cans, 220 L HDPE drum

2.2 Classification and labelling

2.2.1 Classification and labelling under Directive 99/45/EC

Not proposed.

2.2.2 Classification and labelling under Regulation (EC) No 1272/2008

The following labelling is proposed in accordance with Regulation (EC) No 1272/2008:

Hazard classes and categories:	
Eye Dam. 1, STOT SE 2, STOT RE 2	
Hazard pictograms:	
GHS02	flame
GHS05	corrosion
GHS07	exclamation mark
GHS08	health hazard
Signal word:	
Danger	
Hazard statements:	
H318	Causes serious eye damage.
H226	Flammable liquid and vapour.
H336	May cause drowsiness or dizziness.
H373	May cause damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
Precautionary statements:	
P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P310	IF exposed or concerned: Immediately call a POISON CENTER or a doctor/physician.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to ...
Special rule for labelling of PPP:	
EUH401	To avoid risks to man and the environment, comply with the instructions for use.
Further labelling statements under Regulation (EC) No 1272/2008:	
Product identifier (hazardous components which must be listed on the label): Benzoic acid (CAS No. 65-85-0), propan-1-ol (CAS No. 71-23-8), propan-2-ol (CAS No. 67-63-0), formic acid (CAS No. 64-18-6)	

2.2.3 Standard phrases under Regulation (EC) No 547/2011

SP1	Do not contaminate water with the product or its container (Do not clean application equipment near surface water./Avoid contamination via drains from farmyards and roads).

2.3 Other phrases notified under Regulation (EC) No 547/2011

2.3.1 Restrictions linked to the PPP

The authorisation of the PPP is linked to the following conditions (mandatory labelling):

Human health protection	
SB001	Avoid any unnecessary contact with the product. Misuse can lead to health damage.
SB110	The directive concerning requirements for personal protective gear in plant protection, "Personal protective gear for handling plant protection products" of the Federal Office of Consumer Protection and Food Safety must be observed.
SB166	Do not eat, drink or smoke when using this product.
SE110	Wear tight fitting eye protection when handling the undiluted product.
SF271	Contact with treated surfaces/equipment has to be avoided until coating has dried.
SS110	Wear standard protective gloves (plant protection) when handling the undiluted product.
SS120	Wear standard protective gloves (plant protection) when handling/applying the product ready for application.
SS206	Working clothes (if no specific protective suit is required) and sturdy footwear (e.g. rubber boots) must be worn when applying/handling plant protection products.
SS2101	Wear a protective suit against pesticides and sturdy shoes (e.g. rubber boots) when handling the undiluted product.
SS610	Wear a rubber apron when handling the undiluted product.
ST2102	Wear half mask with combination filter A1-P2 (identification colour: brown/white) according to the BVL guideline "Personal protective equipment for handling plant protection products", current version, when handling the undiluted product.
Integrated pest management (IPM)/sustainable use	
NB663	Due to the manner in which authorisation governs application of the product, bees are not endangered.(B3)
Ecosystem protection	
–	

The authorisation of the PPP is linked to the following conditions (voluntary labelling):

Integrated pest management (IPM)/sustainable use	
NN1001	The product is classified as non-harmful for populations of relevant beneficial insects.

NN1002	The product is classified as non-harmful for populations of relevant beneficial predatory mites and spiders.

2.3.2 Specific restrictions linked to the intended uses

Some of the authorised uses are linked to the following conditions (mandatory labelling):
See 2.4 (Product uses)

Integrated pest management (IPM)/sustainable use	
For use no. 001 to 007: WH915	The instructions for use must include a list of species and/or varieties of crops which are compatible with the application rate provided for (positive list).

2.4 Product uses

GAP-Table of intended uses for Germany

GAP rev. (4), date: 2015-08-12

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance	**benzoic acid**	**Conc. of as :**	**90.00 g/L**
Applicant:	**Menno-Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**central EU**	**non professional use**	☐

Verified by MS: yes

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**			**Application rate**			**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product/ha spray volume L/m², exposure time/ concentration	g as/ha g as/m²	Water L/ha min / max		
001	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		N*	The exposure time is specific to the pathogen and can be reduced, if necessary. *surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection – *The setting of a PHI is without any relevance.

002	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary. *standing areas and vessels - for disinfection -
003	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
004	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								- harmful organisms difficult to inactivate: 4 %	4%: 2.88 g as/m²			
005	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
006	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								- harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
007	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable		N	*cutting tools - for disinfection -
008	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F**	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection – ** The PHI is covered by the conditions of use and/or the vegetation period remaining between the application of the plant protection product and the use of the product (e. g. harvest) or the setting of a PHI in days is not required resp.
009	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%:		F	The exposure time is specific to the pathogen and can be reduced, if necessary.

						mechanical cleaning		exposure time 16 hours: 1 % exposure time 4 hours: 2%	0.72 g as/m² 2%: 1.44 g as/m²			* standing areas and vessels - for disinfection -
010	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
011	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

012	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
013	DE	vegetables NNNVV	G* I*	viruses BXXXXX** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
014	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable		F	*cutting tools - for disinfection -
015	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
016	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
017	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 %	7200 or 14400 g as/ha 1%: 0.72 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary.

								exposure time 4 hours: 2%	2%: 1.44 g as/m²			*sealed, plane, non profiled standing areas - for disinfection -
018	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
019	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								- harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
020	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
021	DE	potato SOLTU (reproductive material)	G* I*	bacterial and fungal harmful organisms FBPXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough	1	exposure time 3 minutes: 4 %	not applicable		F	*cutting tools - for disinfection -

				viruses BXXXXX ** viroids BXVXXX**		mechanical cleaning						
022	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
023	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
024	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
025	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m²	7200 or 14400 or 28800 g as/ha		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls,

								exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			machinery and equipment etc. - for disinfection -
026	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								difficult to inactivate: 4 %				
027	DE	tobacco NIOTA	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²		F	The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
028	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable		F	*cutting tools - for disinfection -

** no EPPO-Code

Remarks:

(1) Numeration of uses in accordance with the application/as verified by MS
(2) Member State(s) or zone for which use is applied for
(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided
(8) Min. interval between applications (days) were relevant
(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)
(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)
(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.

3 Risk management

3.1 Reasoned statement of the overall conclusions taken in accordance with the Uniform Principles

3.1.1 Physical and chemical properties (Part B, Section 1, Points 2 and 4)

Overall Summary:

VP-LF/5 (Menno Florades) was the representative formulation during the first EU review process and is the representative formulation for the renewal process. The product has been previously evaluated according to Uniform Principles. All submitted studies were already evaluated during the EU process are described in the RAR for benzoic acid and are not evaluated again.

The product MENNO Florades is a SL-formulation. The appearance of the product is that of a clear, yellowish liquid. It is not explosive, has no oxidising properties. It has a self-ignition temperature of 435 °C and a flash point of 19.2 °C. The pH of a 1% solution in water is 3.0 at 19.8 °C. The surface tension is 53.4 mN/m at 20 °C, the relative density is 0.999 g/cm³ at 20 °C and the dynamic viscosity is 5.5 mPas at 40 °C. MENNO Florades is a Newtonian liquid The stability data indicate a shelf life of at least 5 years at ambient temperature in PE packaging. Its technical characteristics are acceptable for a SL-formulation.

The recommended use rates are between 1 % and 4 %.

Implications for labelling: see 2.2.

Compliance with FAO specifications:
The product MENNO Florades complies with FAO specifications.

Compliance with FAO guidelines:
The product MENNO Florades complies with FAO specifications, as far as could be assessed. In order to fully assess compliance with FAO specifications regarding <state test>, a new report on <state test> has been provided.

Compatibility of mixtures:
No tank mixture is foreseen.

Nature and characteristics of the packaging:
Information with regard to type, dimensions, capacity, size of opening, type of closure, strength, leakproofness, resistance to normal transport & handling, resistance to & compatibility with the contents of the packaging, have been submitted, evaluated and is considered to be acceptable.

Nature and characteristics of the protective clothing and equipment:
Information regarding the required protective clothing and equipment for the safe handling of MENNO Florades has been provided and is considered to be acceptable.

3.1.2 Methods of analysis (Part B, Section 2, Point 5)

3.1.2.1 Analytical method for the formulation (Part B, Section 2, Point 5.2)

Analytical methods for the determination of benzoic acid and its impurities and relevance of CIPAC methods were evaluated as part in the EU review. The respective data are considered adequate and are not included in this submission. Additional studies to support the registration of VP-LF/5 (Menno Florades) not previously assessed are given below. All relevant data are provided and are considered adequate.

There is no CIPAC method available for the determination of benzoic acid.

3.1.2.2 Analytical methods for residues (Part B, Section 2, Points 5.3 – 5.8)

Residue analytical methods are not required for benzoic acid in food commodities of plant and animal.

The following data gaps, which should not prevent an authorisation of the product, were noticed:
An analytical method for benzoic acid in air is missing.
An analytical method for benzoic acid in body fluids and tissues is missing.

This application was submitted before publication of conclusions on the pesticides peer review (EFSA Journal 2016;14(12): 4657). As result of the peer review, residue definitions for soil, drinking/ground water, surface water, air and body fluids and tissues were set. Acceptable analytical methods for benzoic acid in soil, drinking/ground water and air were submitted.

In addition to the above mentioned data gaps, the following method was requested as a result of the peer review:
- An independent laboratory validation (ILV) of the method for benzoic acid in drinking water.

The identified data gaps in surface water are not considered here because the required LOQ for surface water are magnitudes higher than the drinking water limit. Because of the required high dilution of samples the influence of sample matrix is negligible. Therefore, surface water samples can be analyzed with the method validated for drinking water.

It is considered sufficient to fill the data gaps in the context of the next application for renewal of the active substance approval.

3.1.3 Mammalian Toxicology

3.1.3.1 Acute Toxicity

The product MENNO Florades was the representative formulation for the approval of benzoic acid in the EU. The studies were already described in the monograph on benzoic acid and are not reported in detail again.
MENNO Florades containing 90 g/L benzoic acid has a low toxicity in respect to oral and dermal toxicity. Its acute inhalation toxicity is also low. It has no sensitizing properties. It is not irritating to skin but to eyes (H318).

3.1.3.2 Operator Exposure

An exposure assessment for the intended uses of MENNO Florades was already presented during the renewal evaluation of benzoic acid at EU level. Nevertheless, calculations are presented again for default dermal absorption values acc. to EFSA guidance in Part B Section 3.
According to the model calculations, it can be concluded that operator exposure for spraying (or foaming) surfaces and for dipping of small tools with protective gloves is acceptable.

3.1.3.3 Bystander Exposure

No bystander and resident exposure is expected since the product is applied in greenhouses or storage rooms.

3.1.3.4 Worker Exposure

The critical use for the worker is handling equipment treated with MENNO Florades. No appropriate model exists for this scenario. As shown in Part B Section 3 the worker exposure for handling treated equipment is acceptable. However, treated equipment should not be handled before the benzoic acid solution has dried.

Implications for labelling resulting from operator, worker, bystander assessments:

See 2.3

3.1.3.5 Groundwater Metabolites

No metabolite is predicted > 0.1 µg/l in groundwater.

3.1.4 Residues and Consumer Exposure

3.1.4.1 Residues

The intended uses are not relevant in terms of consumer health protection. Application fields for benzoic acid are disinfection of deposit areas (fleece mats, ebb/flood benches), culture vessels, knives, and gardening equipment by directed coarse spraying, pouring of foam or aqueous solution, dipping or watering without air assistant pressure. Neither plants nor soil will be treated with the compound. Furthermore, benzoic acid is a natural substance in plants and is used extensively as additive in food and feeding stuff. The submission of residue data is not necessary.
Due to the low toxicity of the active substance and the low dietary exposure benzoic acid was included in Annex IV of of Regulation (EC) No 396/2005. No MRLs were set.

3.1.4.2 Consumer exposure

No risk assessment is necessary due to the intrinsic properties of the active ingredient. Chronic as well as short-term intake of benzoic acid residues is unlikely to present a public health concern.

Substance	ADI/ARfD	Model / Diet	ADI/ARfD Consumption
Benzoic acid	ADI: 5 mg/kg bw/d	Not necessary	
	ARfD: not allocated	Not necessary	

3.1.5 Environmental fate and behaviour (Part B, Section 5, Point 9)

A full exposure assessment for the plant protection product MENNO Florades in its intended uses in rooms, buildings or greenhouses is documented in detail in the core assessment performed by zRMS Germany.

The following chapters summarise specific exposure assessment for soil and surface water and the specific risk assessment for groundwater for the authorisation of MENNO Florades in Germany according to its intended uses.

The application will take place in protected areas. Thus there is no direct application to the soil, but there is the possibility of deposition after volatilisation. In the current risk assessment for active substances in the EU process it has been common practice in the past to assume that the emissions to the environment from closed structures such as greenhouses and walk-in tunnels can be considered negligible. In the last years it has become more and more common to assume a deposition value of 0.1 % of the dose rate as drift input to surface water and other non-target areas (Linders and Jager, 1997).[1]

Metabolites

No environmental occurring metabolites of benzoic acid requiring further assessment according to the results of the assessment of benzoic acid for EU approval were detected.

3.1.5.1 Predicted Environmental Concentration in Soil (PECsoil) (Part B, Section 5, Points 9.4 and 9.5)

The PEC_{soil} using a depth of 5 cm can be found in the core assessment. Due to the risk profile of the substance and the indoor use, no national PEC_{soil} with deviating depth was calculated.

Overview of PEC_{soil} values according to core assessment

active substance/ preparation	soil relevant application rate (g/ha)	PEC_{act} (mg/kg)
benzoic acid	28.8 (outside)	0.038

3.1.5.2 Predicted Environmental Concentration in Ground Water (PECGW) (Part B, Section 5, Point 9.6)

In accordance with the LoEP, the zRMS considers it not necessary to conduct a leaching assessment for this specific active substance in the intended uses. Even not deemed necessary, the applicant provided a calculation of $PEC_{ground\ water}$ with FOCUS PELMO 5.5.3, FOCUS PEARL 4.4.4 and FOCUS MACRO 5.5.3 models including all available scenarios (Châteaudun for FOCUS MACRO) and two different seasons and absolute worst case assumptions concerning the application rate. All obtained PEC_{gw} values were below 0.1 µg/L.

[1] EFSA Guidance Document on clustering and ranking of emissions of active substances of plant protection products and transformation products of these active substances from protected crops (greenhouses and crops grown under cover) to relevant environmental compartments. EFSA Journal 2014;12(3):3615, 43 pp., doi:10.2903/j.efsa.2014.3615

3.1.5.3 Predicted Environmental Concentration in Surface Water (PECSW) (Part B, Section 5, Points 9.7 and 9.8)

The PEC_{sw} using a FOCUS step 1 can be found in the core assessment. Due to the risk profile of the substance and the indoor use, no national PEC_{sw} with deviating depth was calculated.

PEC_{sw} Focus step 1 according to core assessment

FOCUS Step 1	**PEC_{sw} (µg/L)**	**PEC_{sed} (µg/kg)**
	9.6399	1.7329

3.1.5.4 Predicted Environmental Concentration in Air (PECAir) (Part B, Section 5, Point 9.9)

The vapour pressure at 20 °C of the active substance benzoic acid is about 0.1 Pa. Hence the active substance benzoic acid is regarded as volatile. According to the FOCUS Air Guidance (SANCO/10553/2006), short-range transport in air has to be considered.

A long range transport is possible, but entrance in the natural compartments by plant protection is low compared to other sources.

Implications for labelling resulting from environmental fate assessment:
For the authorization of the plant protection product MENNO Florades following labeling and conditions of use are mandatory:

Classification and labelling

Based on the data on the active substance benzoic acid the plant protection product MENNO Florades is considered to be readily degradable in the sense of the CLP regulation.

3.1.6 Ecotoxicology (Part B, Section 6, Point 10)

A full risk assessment according to Uniform Principles for the plant protection product MENNO Florades in its intended uses in protected areas is documented in detail in the core assessment performed by zRMS Germany. The intended uses of MENNO Florades in Germany are generally covered by the uses evaluated in the course of the core assessment by Germany.

The authorisation in Germany is not linked with any risk mitigation measures regarding effects on non-target organisms.

For reasons of better readability the intended uses in of the plant protection product MENNO Florades are summarised as follows:

Critical use pattern of MENNO Florades

Method	Application area	Water [L/ha], max.	Active substance [kg/ha], max.	Number of applications	Exposure time until full efficacy is reached	Application timing	Product con-centration

Directed coarse spray, foaming (lathering), watering (pouring of aqueous solution or foam), flooding	Protected rooms (Greenhouse, Indoor) in agriculture, horticulture and floriculture, disinfection of surfaces, tools and culture vessels/containers	8000	7.2	1	16 h	Not relevant	1 %
		8000	14.4	1	16 h	Not relevant	2 %
		8000	28.8	1	16 h	Not relevant	4 %
Dipping		n.a.	n.a.	n.a.	3min	Not relevant	4 %

The worst case application rate (indoor/glasshouse) is 28.8 kg benzoic acid /ha (2880 mg/m²). It is assumed that 0.1% of the applied amount are introduced to the environment via volatilisation.

3.1.6.1 Effects on Terrestrial Vertebrates (Part B, Section 6, Points 10.1 and 10.3)

No additional data concerning effects on birds was evaluated.

EU agreed endpoints and new endpoints

Species	**Substance**	**Exposure System**	**Results**
Rat	Benzoic acid	Acute oral toxicity	LD_{50} > 1700 mg a.s./kg b.w.
Rat	MENNO Florades	Acute oral toxicity	LD_{50} > 2000 mg product/kg b.w.
Rat	Benzoic acid	Reproduction study, four generations	500 mg a.s./kg b.w./day (NOAEL > 10000 ppm)

All endpoints are reported in the DAR from 2000 and are reconfirmed in the current reassessment procedure.

The risk assessment for effects on birds and other terrestrial vertebrates was carried out according to the European Food Safety Authority Guidance Document on Risk Assessment for Birds and Mammals on request from EFSA (EFSA Journal 2009; 7(12): 1438).

Terrestrial vertebrates are not supposed to be at risk following the intended uses of MENNO Florades due to the natural occurrence of the active substance benzoic acid, its commercial use in food and feedstuff as well as its low toxicity. The exposure form the use as plant protection product can be considered negligible since MENNO Florades is intended to be used indoor only.

For details see Part B, National Addendum-Germany, Section 6, chapters 6.2 and 6.3.

3.1.6.2 Effects on Aquatic Species (Part B, Section 6, Point 10.2)

Endpoints used for risk assessment for aquatic organisms for MENNO Florades

Species	**Substance**	**Exposure System**	**Results [mg a.s./L]**

Brachydanio rerio	MENNO Florades	96 h, semi-static	LC_{50} > 100 mg product/L_{nom} LC_{50} > 9 mg a.s./L_{nom}
Daphnia magna	MENNO Florades	48 h, static	EC_{50} = 255 mg product/L_{nom} EC_{50} = 23 mg a.s./L_{nom}
Desmodesmus subspicatus	MENNO Florades	72 h, static	E_rC_{50} > 934 mg product/L_{mm} E_rC_{50} > 84 mg a.s./L_{mm}

All endpoints were not included in the first DAR of 2000 but are now part of the renewal assessment.

Results of aquatic risk assessment for the intended for uses of MENNO Florades in protected areas based on FOCUS Surface Water PEC values is presented in the core assessment, Part B, Section 6, chapter 6.5.

Based on the calculated concentrations of benzoic acid in surface water (PEC_{SW} FOCUS Step 1), the calculated TER values for the acute risk resulting from an exposure of aquatic organisms to benzoic acid according to the GAP of the formulation MENNO Florades achieve the acceptability criteria TER ≥ 100, according to Commission Regulation (EU) No 546/2011, Annex, Part I C, 2. Specific principles, point 2.5.2. The results of the assessment indicate an acceptable acute risk for aquatic organisms due to the intended indoor use of MENNO Florades according to the label.

Since no reliable long term toxicity data are available but the acute risk is very low the zRMS does not expect benzoic acid to pose an unacceptable long-term risk to the aquatic environment. Furthermore the active substance benzoic acid is naturally occurring in the environment and the application of the formulated product MENNO Florades is intended for indoor uses only, the risk to aquatic organisms is expected to be low.

3.1.6.3 Effects on Bees and Other Arthropod Species (Part B, Section 6, Points 10.4 and 10.5)

Bees

The product MENNO Florades is used as disinfectant of surfaces and tools in protected areas only (e.g. greenhouse, machine halls etc.).

Toxicity

The active substance benzoic acid is a natural compound exerting a low toxicity towards animals. The following table presents the results of the first EU review.

Table: Results of laboratory bee toxicity studies

Test substance	Exposure route	LD_{50}	Reference
benzoic acid tech.	oral 48 h	not required *	Review report for the active substance benzoic acid (2003) SANCO/1396/2001-Final
	contact 48 h	not required *	

* EU agreed endpoint

Exposure

The recommended use pattern for MENNO Florades includes application at a maximum application rate of up to 8000 L product/ha. This maximum single application rate is equivalent to 7992 g product/ha. As the product MENNO Florades is used in protected areas only and a direct treatment of plants is not intended, exposure to honeybees is very unlikely.

Hazard Quotion

The Hazard Quotient (HQ) approach is not applicable due to the proposed use of MENNO Florades.

Risk assessment
The product MENNO Florades is used in protected areas only and a direct treatment of plants is not intended. Hence, a risk for honeybees can be excluded.

Overall conclusion:
It is concluded that MENNO Florades will not adversely affect bees or bee colonies when used as recommended. The following restrictions should be included on the label: Due to the manner in which authorisation governs application of the product, bees are not endangered.

Other non-target arthropods

Benzoic acid is a natural compound in almost every environmental compartment (water, soil etc.) and it is readily biodegradable in natural systems (the compound is used as reference compound in the OECD 301 test for ready biodegradability). The product MENNO Florades is used as disinfectant of surfaces and tools in protected areas only (e.g. greenhouse, machine halls etc.). A discharge of the product to the environment is unlikely and the intended use of the product does not include a direct treatment of plants or any potential food items for wildlife animals. Considering these aspects, no risk for non-target arthropods from the use of MENNO Florades is assumed and no further assessments were performed (core assessment Part B, section 6, chapter 6.7).

3.1.6.4 Effects on Earthworms and Other Soil Marco-organisms (Part B, Section 6, Point 10.6)

Summary of available endpoints for earthworms and other soil macro- and mesofauna

Species	Substance	Exposure System	Results
Eisenia fetida	Benzoic acid	Chronic, 56 days, artificial soil, 5% peat	NOEC = 384 mg a.s./kg dw soil
Folsomia candida	Benzoic acid	Chronic, 28 days, artificial soil, 5% peat	NOEC = 143 mg a.s./kg dw soil

Both endpoints were not included in the first DAR of 2000 but are now part of the renewal assessment.

Based on the predicted concentrations of benzoic acid in soil, the TER values describing the long-term risk for earthworms and other non-target soil organisms following exposure to benzoic acid according to the GAP of the formulation MENNO Florades achieve the acceptability criteria of TER $\geq$ 5 according to Commission Regulation (EU) No 546/2011, Annex, Part I C, 2. Specific principles, point 2.5.2. The results of the assessment indicate an acceptable risk for soil organisms due to the intended uses of MENNO Florades in protected areas according to the label.

3.1.6.5 Effects on organic matter breakdown (Part B, Section 6, Point 10.6)

Since no risk was identified for soil fauna, soil micro-organisms and non-target arthropods from the use of MENNO Florades/benzoic acid in protected areas, data on the effects on organic matter breakdown (litterbag) is not required.

3.1.6.6 Effects on Soil Non-target Micro-organisms (Part B, Section 6, Point 10.7)

Based on the predicted concentrations of benzoic acid in soil, the risk to soil microbial processes following exposure to benzoic acid according to the GAP of the formulation MENNO Florades is considered to be

acceptable according to Commission Regulation (EU) No 546/2011, Annex, Part I C, 2. Specific principles, point 2.5.2.

3.1.6.7 Assessment of Potential for Effects on Other Non-target Organisms (Flora and Fauna) (Part B, Section 6, Point 10.8)

Terrestrial plants

The product MENNO Florades is used as disinfectant of surfaces and tools in protected areas only (e.g. greenhouse, machine halls etc.). A discharge of the product to the environment is unlikely and the intended use of the product does not include a direct treatment of plants. The active substance benzoic acid is a natural occurring compound in plants and fruits (e.g. *Vaccinium* spp.: > 1300 mg/kg free benzoic acid). Apart from this, it was stated that no unacceptable effects on the environment are expected for the active substance benzoic acid (SANCO/1396/2001-Final). Considering these aspects, no risk for non-target plants from the use of MENNO Florades is assumed and no further assessments were performed (core assessment Part B, section 6, chapter 6.10).

Implications for labelling resulting from ecotoxicological assessment:

For the authorisation of the plant protection product MENNO Florades the following labelling and conditions of use are mandatory:

Classification and labelling

Relevant toxicity	Active substance: benzoic acid (content 90 g/L) LC_{50} > 100 mg product/L_{nom} (*Brachydanio rerio*) EC_{50} = 255 mg product/L_{nom} (*Daphnia magna*) E_rC_{50} > 1000 mg product/L_{mm} (*Desmodesmus subspicatus*) NOEC > 120 mg a.s./L (fish, 28 d, ECHA)
Classification and labelling according to Regulation 1272/2008	
Hazard symbol	Not relevant*
Signal word	No signal word used
Hazard statement	Not relevant*

*please refer to the relevant toxicity data.

Standard phrase according to Regulation (EU) No 547/2011

SP1	Do not contaminate water with the product or its container (Do not clean application equipment near surface water./Avoid contamination via drains from farmyards and roads).

3.1.7 Efficacy (Part B, Section 7, Point 8)

All the data regarding the efficacy of the product have been submitted. These data demonstrate that MENNO Florades fulfils all criteria for efficacy evaluation.

Minimum effective dose:

All efficacy tests included testing of different concentrations of MENNO Florades at different exposure times. Therefore, no special trials on minimum effective dose are required.

Effectiveness:

Effectiveness was tested against a variety of bacteria, fungi, viruses, and viroids which are phytopathogenic for different crops. The combination of the concentration and exposure time necessary for control/inactivation depend on the pathogen.

Phytotoxicity:
No direct application of MENNO Florades to plants is intended. Direct contact to the disinfectant is limited to residues directly after disinfection or unintended contact to plants. No phytotoxicity was observed in the efficacy trials. Use of MENNO Florades according to the instructions is unlikely to cause phytotoxicity. Only when MENNO Florades was directly applied to the plants it caused phytotoxic effects in some cases. However, as a measure of precaution it is recommended in the instructions for use to perform a tolerance test with some plants before treating surfaces, equipment or tools which may have direct contact to plants.

Resistance:
The risk for the development of resistance is considered to be low. Therefore no resistance management strategy is recommended.

Adverse effects on beneficial organisms (other than bees):
MENNO Florades will not affect populations of relevant arthropods and of relevant beneficial predatory mites and spiders due to the specified application pattern.

Adverse effects on soil living organissm
MENNO Florades does not pose a risk to soil macro- and microorganisms.

3.2 Conclusions

With regard to identity, physical, chemical and technical properties, further information and analytical methods an authorisation can be granted.

With respect to analytical methods for residues, an authorisation can be granted.

For all applied uses the efficacy proofed to be sufficient, thus all uses can be granted for authorisation.

MENNO Florades will not adversely affect bees or bee colonies when used as recommended. The following restrictions should be included on the label: Due to the manner in which authorisation governs application of the product, bees are not endangered.

With respect to toxicology, residues and consumer protection an authorisation can be granted.

With respect to fate and ecotoxicology assessment, an authorisation can be granted. Considering an application in accordance with the evaluated use pattern and good agricultural practice as well as strict observance of the conditions of use no harmful effects on groundwater or adverse effects on the ecosystem are to be apprehended.

An authorisation can be granted

3.3 Further information to permit a decision to be made or to support a review of the conditions and restrictions associated with the authorisation

No further information is required.

Appendix 1 – Copy of the product authorisation

See Appendix 4.

Appendix 2 – Copy of the product label

The submitted draft product label has been checked by the competent authority. The applicant is requested to amend the product label in accordance with the decisions made by the competent authority. The final version of the label has to fulfil the requirements according to Article 16 of Directive 91/414/EEC.

Appendix 3 – Letter of Access

Letter(s) of access is/are classified as confidential and, thus, are not attached to this document.

Appendix 4 – Copy of the product authorisation

Will be inserted in the final version.

Bundesamt für
Verbraucherschutz und
Lebensmittelsicherheit

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IHR ZEICHEN
IHRE NACHRICHT VOM

AKTENZEICHEN 200.22100.034407-00/00.96778
(bitte bei Antwort angeben)

DATUM 1. August 2017

ZV1 034407-00/00

MENNO Florades

Zulassungsverfahren für Pflanzenschutzmittel

Bescheid

Das oben genannte Pflanzenschutzmittel

mit dem Wirkstoff:	90 g/l	Benzoesäure
Zulassungsnummer:	034407-00	
Versuchsbezeichnungen:	MEN-23900-BFV-1-SL	
Antrag vom:	18. Dezember 2013	

wird auf der Grundlage von Art. 29 der Verordnung (EG) Nr. 1107/2009 des Europäischen Parlaments und des Rates vom 21. Oktober 2009 über das Inverkehrbringen von Pflanzenschutzmitteln und zur Aufhebung der Richtlinien 79/117/EWG und 91/414/EWG des Rates (ABl. L 309 vom 24.11.2009, S. 1), wie folgt zugelassen:

Zulassungsende

Die Zulassung endet am 31. Januar 2019.

Festgesetzte Anwendungsgebiete bzw. Anwendungen

Es werden folgende Anwendungsgebiete bzw. Anwendungen festgesetzt (siehe Anlage 1):

Anwendungs-nummer	Schadorganismus/ Zweckbestimmung	Pflanzen/-erzeugnisse/ Objekte	Verwendungszweck
034407-00/00-008, 034407-00/00-009, 034407-00/00-010	Bakterielle und pilzliche Schaderreger	Gemüsekulturen	
034407-00/00-015, 034407-00/00-016, 034407-00/00-017	Bakterielle und pilzliche Schaderreger	Kartoffel	
034407-00/00-022, 034407-00/00-023, 034407-00/00-024	Bakterielle und pilzliche Schaderreger	Tabak	
034407-00/00-001, 034407-00/00-002, 034407-00/00-003	Bakterielle und pilzliche Schaderreger	Zierpflanzen	
034407-00/00-014	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Gemüsekulturen	
034407-00/00-021	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Kartoffel	Vermehrungsgut
034407-00/00-028	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Tabak	
034407-00/00-007	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Zierpflanzen	
034407-00/00-011, 034407-00/00-012, 034407-00/00-013	Viren, Viroide	Gemüsekulturen	
034407-00/00-018, 034407-00/00-019, 034407-00/00-020	Viren, Viroide	Kartoffel	
034407-00/00-025, 034407-00/00-026, 034407-00/00-027	Viren, Viroide	Tabak	
034407-00/00-004, 034407-00/00-005, 034407-00/00-006	Viren, Viroide	Zierpflanzen	

Festgesetzte Anwendungsbestimmungen

Es werden folgende Anwendungsbestimmungen gemäß § 36 Abs. 1 S. 1 des Gesetzes zum Schutz der Kulturpflanzen (Pflanzenschutzgesetz - PflSchG) vom 6. Februar 2012 (BGBl. I S. 148, 1281), zuletzt geändert durch Artikel 4 Absatz 84 des Gesetzes vom 18. Juli 2016 (BGBl. I S. 1666), festgesetzt:

Siehe anwendungsbezogene Anwendungsbestimmungen in Anlage 1, jeweils unter Nr. 3.

Verpackungen

Gemäß § 36 Abs. 1 S. 2 Nr. 1 PflSchG sind für das Pflanzenschutzmittel die nachfolgend näher beschriebenen Verpackungen für den beruflichen Anwender zugelassen:

Verpackungs-art	Verpackungs-material	Anzahl		Inhalt		
		von	bis	von	bis	Einheit
Flasche	HDPE	1		2,00		l
Flasche	HDPE	1		1,00		l
Kanister	HDPE	1		10,00	30,00	l
Trommel, Fass, Tonne	HDPE	1		220,00		l

Die Verpackungen für den beruflichen Anwender sind wie folgt zu kennzeichnen:
Anwendung nur durch berufliche Anwender zulässig.

Auflagen

Die Zulassung wird mit folgenden Auflagen gemäß § 36 Abs. 3 S. 1 PflSchG verbunden:

Kennzeichnungsauflagen:

(EB001-2)
SP 1: Mittel und/oder dessen Behälter nicht in Gewässer gelangen lassen. (Ausbringungsgeräte nicht in unmittelbarer Nähe von Oberflächengewässern reinigen./Indirekte Einträge über Hof- und Straßenabläufe verhindern.)

(SB001)
Jeden unnötigen Kontakt mit dem Mittel vermeiden. Missbrauch kann zu Gesundheitsschäden führen.

(SB110)
Die Richtlinie für die Anforderungen an die persönliche Schutzausrüstung im Pflanzenschutz "Persönliche Schutzausrüstung beim Umgang mit Pflanzenschutzmitteln" des Bundesamtes

für Verbraucherschutz und Lebensmittelsicherheit ist zu beachten.

(SB166)
Beim Umgang mit dem Produkt nicht essen, trinken oder rauchen.

(SE110)
Dicht abschließende Schutzbrille tragen beim Umgang mit dem unverdünnten Mittel.

(SF271)
Kontakt mit behandelten Oberflächen/Geräten erst nach Abtrocknung des Belags.

(SS110)
Universal-Schutzhandschuhe (Pflanzenschutz) tragen beim Umgang mit dem unverdünnten Mittel.

(SS120)
Universal-Schutzhandschuhe (Pflanzenschutz) tragen bei Ausbringung/Handhabung des anwendungsfertigen Mittels.

(SS206)
Arbeitskleidung (wenn keine spezifische Schutzkleidung erforderlich ist) und festes Schuhwerk (z.B. Gummistiefel) tragen bei der Ausbringung/Handhabung von Pflanzenschutzmitteln.

(SS2101)
Schutzanzug gegen Pflanzenschutzmittel und festes Schuhwerk (z.B. Gummistiefel) tragen beim Umgang mit dem unverdünnten Mittel.

(SS610)
Gummischürze tragen beim Umgang mit dem unverdünnten Mittel.

(ST2102)
Halbmaske mit Kombinationsfilter A1-P2 (Kennfarbe: braun/weiß) gemäß BVL-Richtlinie für die Anforderungen an die persönliche Schutzausrüstung im Pflanzenschutz, in der jeweils geltenden Fassung, tragen beim Umgang mit dem unverdünnten Mittel.

Siehe anwendungsbezogene Kennzeichnungsauflagen in Anlage 1, jeweils unter Nr. 2.

Vorbehalt

Dieser Bescheid wird mit dem Vorbehalt der nachträglichen Aufnahme, Änderung oder Ergänzung von Anwendungsbestimmungen und Auflagen verbunden.

Angaben zur Einstufung und Kennzeichnung gemäß Verordnung (EG) Nr. 1272/2008

Signalwort:

(S2) Gefahr

Gefahrenpiktogramme:

(GHS02) Flamme

(GHS05) Ätzwirkung

(GHS07) Ausrufezeichen

(GHS08) Gesundheitsgefahr

Gefahrenhinweise (H-Sätze):

(H226)
Flüssigkeit und Dampf entzündbar.

(H318)
Verursacht schwere Augenschäden.

(H336)
Kann Schläfrigkeit und Benommenheit verursachen.

(H373)
Kann die Organe schädigen <alle betroffenen Organe nennen, sofern bekannt> bei längerer oder wiederholter Exposition <Expositionsweg angeben, wenn schlüssig belegt ist, dass diese Gefahr bei keinem anderen Expositionsweg besteht>.

(EUH 401)
Zur Vermeidung von Risiken für Mensch und Umwelt die Gebrauchsanleitung einhalten.

Sicherheitshinweise (P-Sätze):

(P101)
Ist ärztlicher Rat erforderlich, Verpackung oder Kennzeichnungsetikett bereithalten.

(P102)

Darf nicht in die Hände von Kindern gelangen.

(P210)
Von Hitze, heißen Oberflächen, Funken, offenen Flammen sowie anderen Zündquellenarten fernhalten. Nicht rauchen.

(P260)
Staub/Rauch/Gas/Nebel/Dampf/Aerosol nicht einatmen.

(P271)
Nur im Freien oder in gut belüfteten Räumen verwenden.

(P280)
Schutzhandschuhe/Schutzkleidung/Augenschutz/Gesichtsschutz tragen.

(P305+P351+P338)
BEI KONTAKT MIT DEN AUGEN: Einige Minuten lang behutsam mit Wasser spülen. Eventuell vorhandene Kontaktlinsen nach Möglichkeit entfernen. Weiter spülen.

(P308+P310)
BEI Exposition oder falls betroffen: Sofort GIFTINFORMATIONSZENTRUM oder Arzt anrufen.

(P403+P233)
An einem gut belüfteten Ort aufbewahren. Behälter dicht verschlossen halten.

(P405)
Unter Verschluss aufbewahren.

(P501)
Inhalt/Behälter ... zuführen.

Abgelehnte Anwendungsgebiete bzw. Anwendungen

Für folgende Anwendungsgebiete bzw. Anwendungen lehne ich Ihren Antrag ab (siehe Anlage 2):
- keine -

Hinweise

Auf dem Etikett und in der Gebrauchsanleitung kann angegeben werden:

(NB663)

Aufgrund der durch die Zulassung festgelegten Anwendungen des Mittels werden Bienen nicht gefährdet (B3).

(NN1001)

Das Mittel wird als nicht schädigend für Populationen relevanter Nutzinsekten eingestuft.

(NN1002)

Das Mittel wird als nicht schädigend für Populationen relevanter Raubmilben und Spinnen eingestuft.

Weitere Hinweise und Bemerkungen

Zum Etikett:

Auf dem Etikett ist zusätzlich zum Wirkstoffgehalt anzugeben:

"Enthält ca. 130 g/L 2-Propanol als Lösungsmittel und ca. 40 g/L Ameisensäure als Puffer".

Gemäß Artikel 18 der Verordnung (EG) Nr. 1272/2008 sind alle toxikologisch relevanten Stoffe, die zur Einstufung eines Gemisches beitragen, auf dem Etikett aufzuführen. Folgender Hinweis muss auf dem Etikett erfolgen: "Produktidentifikatoren (Gefahrenbestimmende Komponenten): Ameisensäure (CAS-Nr. 64-18-6), Benzoesäure (CAS-Nr. 65-85-0), Propan-1-ol (CAS-Nr. 71-23-8), 2-Propanol (CAS-Nr. 67-63-0)."

Aufgrund des Kommentars eines cMS sollten in der Gebrauchsanleitung genauere Angaben hinsichtlich der Behandlung zu desinfizierender Flächen und Geräte (Einwirkdauer, Antrocknen des Mittels) gegeben werden.

Zu KIIA 4.5

Ich weise darauf hin, dass spätestens bei der erneuten Genehmigung des Wirkstoffs Benzoesäure die folgenden Unterlagen einzureichen sind:

- KIIA 4.5 (Trinkwasser/ ILV)

Die geeignete Analysenmethode von Buttler, 2014 (Studien-Nr. CRA16162) zur Bestimmung von Benzoesäure in Trinkwasser ist durch ein unabhängiges Labor zu validieren (ILV).

Begründung:

Um sicher zu stellen, dass sich vorgeschlagene Analysenverfahren allgemein eignen, ist gemäß der Verordnung (EU) Nr. 283/2013 eine unabhängige Validierung erforderlich.

Vorsorglich weise ich darauf hin, dass bisher mitgeteilte Forderungen bestehen bleiben, soweit sie noch nicht erfüllt sind.

Unterbleibt eine Beanstandung der vorgelegten Gebrauchsanleitung, so ist daraus nicht zu schließen, dass sie als ordnungsgemäß angesehen wird. Die Verantwortung des Zulassungsinhabers für die Übereinstimmung mit dem Zulassungsbescheid bleibt bestehen.

Hinsichtlich der Gebühren erhalten Sie einen gesonderten Bescheid.

Rechtsbehelfsbelehrung

Gegen diesen Bescheid kann innerhalb eines Monats nach Bekanntgabe Widerspruch erhoben werden. Der Widerspruch ist bei dem Bundesamt für Verbraucherschutz und Lebensmittelsicherheit, Messeweg 11/12, 38104 Braunschweig, schriftlich oder zur Niederschrift einzulegen.

Mit freundlichen Grüßen
im Auftrag

gez. Dr. Gerhard Joermann

Dieses Schreiben wurde maschinell erstellt und ist daher ohne Unterschrift gültig.

Anlage

Anlage 1 zugelassene Anwendung: 034407-00/00-001

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	zur Desinfektion / Keine direkte Behandlung der Pflanzen
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-002

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-003

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-004

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Einwirkungszeit: 16 Stunden / Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-005

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-006

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-007

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-008

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-009

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-010

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-011

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-012

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Einwirkungszeit: 16 Stunden / Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-013

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-014

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-015

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-016

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-017

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-018

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-019

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-020

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-021

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung:	Bakterielle und pilzliche Schaderreger, Viren, Viroide
Pflanzen/-erzeugnisse/Objekte:	Kartoffel
Verwendungszweck:	Vermehrungsgut

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-022

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-023

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-024

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-025

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-026

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-027

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-028

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Bundesamt für
Verbraucherschutz und
Lebensmittelsicherheit

Bundesamt für Verbraucherschutz und Lebensmittelsicherheit
Dienstsitz Braunschweig • Postfach 15 64 • 38005 Braunschweig

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IHR ZEICHEN
IHRE NACHRICHT VOM

AKTENZEICHEN 200.22100.034407-00/00.96778
(bitte bei Antwort angeben)

DATUM 1. August 2017

ZV1 034407-00/00

MENNO Florades

Zulassungsverfahren für Pflanzenschutzmittel

Bescheid

Das oben genannte Pflanzenschutzmittel

mit dem Wirkstoff:	90 g/l	Benzoesäure
Zulassungsnummer:	034407-00	
Versuchsbezeichnungen:	MEN-23900-BFV-1-SL	
Antrag vom:	18. Dezember 2013	

wird auf der Grundlage von Art. 29 der Verordnung (EG) Nr. 1107/2009 des Europäischen Parlaments und des Rates vom 21. Oktober 2009 über das Inverkehrbringen von Pflanzenschutzmitteln und zur Aufhebung der Richtlinien 79/117/EWG und 91/414/EWG des Rates (ABl. L 309 vom 24.11.2009, S. 1), wie folgt zugelassen:

Zulassungsende

Die Zulassung endet am 31. Januar 2019.

Festgesetzte Anwendungsgebiete bzw. Anwendungen

Es werden folgende Anwendungsgebiete bzw. Anwendungen festgesetzt (siehe Anlage 1):

Anwendungs-nummer	Schadorganismus/ Zweckbestimmung	Pflanzen/-erzeugnisse/ Objekte	Verwendungszweck
034407-00/00-008, 034407-00/00-009, 034407-00/00-010	Bakterielle und pilzliche Schaderreger	Gemüsekulturen	
034407-00/00-015, 034407-00/00-016, 034407-00/00-017	Bakterielle und pilzliche Schaderreger	Kartoffel	
034407-00/00-022, 034407-00/00-023, 034407-00/00-024	Bakterielle und pilzliche Schaderreger	Tabak	
034407-00/00-001, 034407-00/00-002, 034407-00/00-003	Bakterielle und pilzliche Schaderreger	Zierpflanzen	
034407-00/00-014	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Gemüsekulturen	
034407-00/00-021	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Kartoffel	Vermehrungsgut
034407-00/00-028	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Tabak	
034407-00/00-007	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Zierpflanzen	
034407-00/00-011, 034407-00/00-012, 034407-00/00-013	Viren, Viroide	Gemüsekulturen	
034407-00/00-018, 034407-00/00-019, 034407-00/00-020	Viren, Viroide	Kartoffel	
034407-00/00-025, 034407-00/00-026, 034407-00/00-027	Viren, Viroide	Tabak	
034407-00/00-004, 034407-00/00-005, 034407-00/00-006	Viren, Viroide	Zierpflanzen	

Festgesetzte Anwendungsbestimmungen

Es werden folgende Anwendungsbestimmungen gemäß § 36 Abs. 1 S. 1 des Gesetzes zum Schutz der Kulturpflanzen (Pflanzenschutzgesetz - PflSchG) vom 6. Februar 2012 (BGBl. I S. 148, 1281), zuletzt geändert durch Artikel 4 Absatz 84 des Gesetzes vom 18. Juli 2016 (BGBl. I S. 1666), festgesetzt:

Siehe anwendungsbezogene Anwendungsbestimmungen in Anlage 1, jeweils unter Nr. 3.

Verpackungen

Gemäß § 36 Abs. 1 S. 2 Nr. 1 PflSchG sind für das Pflanzenschutzmittel die nachfolgend näher beschriebenen Verpackungen für den beruflichen Anwender zugelassen:

Verpackungs-art	Verpackungs-material	Anzahl		Inhalt		
		von	bis	von	bis	Einheit
Flasche	HDPE	1		2,00		l
Flasche	HDPE	1		1,00		l
Kanister	HDPE	1		10,00	30,00	l
Trommel, Fass, Tonne	HDPE	1		220,00		l

Die Verpackungen für den beruflichen Anwender sind wie folgt zu kennzeichnen:
Anwendung nur durch berufliche Anwender zulässig.

Auflagen

Die Zulassung wird mit folgenden Auflagen gemäß § 36 Abs. 3 S. 1 PflSchG verbunden:

Kennzeichnungsauflagen:

(EB001-2)
SP 1: Mittel und/oder dessen Behälter nicht in Gewässer gelangen lassen. (Ausbringungsgeräte nicht in unmittelbarer Nähe von Oberflächengewässern reinigen./Indirekte Einträge über Hof- und Straßenabläufe verhindern.)

(SB001)
Jeden unnötigen Kontakt mit dem Mittel vermeiden. Missbrauch kann zu Gesundheitsschäden führen.

(SB110)
Die Richtlinie für die Anforderungen an die persönliche Schutzausrüstung im Pflanzenschutz "Persönliche Schutzausrüstung beim Umgang mit Pflanzenschutzmitteln" des Bundesamtes

für Verbraucherschutz und Lebensmittelsicherheit ist zu beachten.

(SB166)
Beim Umgang mit dem Produkt nicht essen, trinken oder rauchen.

(SE110)
Dicht abschließende Schutzbrille tragen beim Umgang mit dem unverdünnten Mittel.

(SF271)
Kontakt mit behandelten Oberflächen/Geräten erst nach Abtrocknung des Belags.

(SS110)
Universal-Schutzhandschuhe (Pflanzenschutz) tragen beim Umgang mit dem unverdünnten Mittel.

(SS120)
Universal-Schutzhandschuhe (Pflanzenschutz) tragen bei Ausbringung/Handhabung des anwendungsfertigen Mittels.

(SS206)
Arbeitskleidung (wenn keine spezifische Schutzkleidung erforderlich ist) und festes Schuhwerk (z.B. Gummistiefel) tragen bei der Ausbringung/Handhabung von Pflanzenschutzmitteln.

(SS2101)
Schutzanzug gegen Pflanzenschutzmittel und festes Schuhwerk (z.B. Gummistiefel) tragen beim Umgang mit dem unverdünnten Mittel.

(SS610)
Gummischürze tragen beim Umgang mit dem unverdünnten Mittel.

(ST2102)
Halbmaske mit Kombinationsfilter A1-P2 (Kennfarbe: braun/weiß) gemäß BVL-Richtlinie für die Anforderungen an die persönliche Schutzausrüstung im Pflanzenschutz, in der jeweils geltenden Fassung, tragen beim Umgang mit dem unverdünnten Mittel.

Siehe anwendungsbezogene Kennzeichnungsauflagen in Anlage 1, jeweils unter Nr. 2.

Vorbehalt

Dieser Bescheid wird mit dem Vorbehalt der nachträglichen Aufnahme, Änderung oder Ergänzung von Anwendungsbestimmungen und Auflagen verbunden.

Angaben zur Einstufung und Kennzeichnung gemäß Verordnung (EG) Nr. 1272/2008

Signalwort:

(S2) Gefahr

Gefahrenpiktogramme:

(GHS02) Flamme

(GHS05) Ätzwirkung

(GHS07) Ausrufezeichen

(GHS08) Gesundheitsgefahr

Gefahrenhinweise (H-Sätze):

(H226)
Flüssigkeit und Dampf entzündbar.

(H318)
Verursacht schwere Augenschäden.

(H336)
Kann Schläfrigkeit und Benommenheit verursachen.

(H373)
Kann die Organe schädigen <alle betroffenen Organe nennen, sofern bekannt> bei längerer oder wiederholter Exposition <Expositionsweg angeben, wenn schlüssig belegt ist, dass diese Gefahr bei keinem anderen Expositionsweg besteht>.

(EUH 401)
Zur Vermeidung von Risiken für Mensch und Umwelt die Gebrauchsanleitung einhalten.

Sicherheitshinweise (P-Sätze):

(P101)
Ist ärztlicher Rat erforderlich, Verpackung oder Kennzeichnungsetikett bereithalten.

(P102)

Darf nicht in die Hände von Kindern gelangen.

(P210)
Von Hitze, heißen Oberflächen, Funken, offenen Flammen sowie anderen Zündquellenarten fernhalten. Nicht rauchen.

(P260)
Staub/Rauch/Gas/Nebel/Dampf/Aerosol nicht einatmen.

(P271)
Nur im Freien oder in gut belüfteten Räumen verwenden.

(P280)
Schutzhandschuhe/Schutzkleidung/Augenschutz/Gesichtsschutz tragen.

(P305+P351+P338)
BEI KONTAKT MIT DEN AUGEN: Einige Minuten lang behutsam mit Wasser spülen. Eventuell vorhandene Kontaktlinsen nach Möglichkeit entfernen. Weiter spülen.

(P308+P310)
BEI Exposition oder falls betroffen: Sofort GIFTINFORMATIONSZENTRUM oder Arzt anrufen.

(P403+P233)
An einem gut belüfteten Ort aufbewahren. Behälter dicht verschlossen halten.

(P405)
Unter Verschluss aufbewahren.

(P501)
Inhalt/Behälter ... zuführen.

Abgelehnte Anwendungsgebiete bzw. Anwendungen

Für folgende Anwendungsgebiete bzw. Anwendungen lehne ich Ihren Antrag ab (siehe Anlage 2):
- keine -

Hinweise

Auf dem Etikett und in der Gebrauchsanleitung kann angegeben werden:

(NB663)

Aufgrund der durch die Zulassung festgelegten Anwendungen des Mittels werden Bienen nicht gefährdet (B3).

(NN1001)

Das Mittel wird als nicht schädigend für Populationen relevanter Nutzinsekten eingestuft.

(NN1002)

Das Mittel wird als nicht schädigend für Populationen relevanter Raubmilben und Spinnen eingestuft.

Weitere Hinweise und Bemerkungen

Zum Etikett:

Auf dem Etikett ist zusätzlich zum Wirkstoffgehalt anzugeben:

"Enthält ca. 130 g/L 2-Propanol als Lösungsmittel und ca. 40 g/L Ameisensäure als Puffer".

Gemäß Artikel 18 der Verordnung (EG) Nr. 1272/2008 sind alle toxikologisch relevanten Stoffe, die zur Einstufung eines Gemisches beitragen, auf dem Etikett aufzuführen. Folgender Hinweis muss auf dem Etikett erfolgen: "Produktidentifikatoren (Gefahrenbestimmende Komponenten): Ameisensäure (CAS-Nr. 64-18-6), Benzoesäure (CAS-Nr. 65-85-0), Propan-1-ol (CAS-Nr. 71-23-8), 2-Propanol (CAS-Nr. 67-63-0)."

Aufgrund des Kommentars eines cMS sollten in der Gebrauchsanleitung genauere Angaben hinsichtlich der Behandlung zu desinfizierender Flächen und Geräte (Einwirkdauer, Antrocknen des Mittels) gegeben werden.

Zu KIIA 4.5

Ich weise darauf hin, dass spätestens bei der erneuten Genehmigung des Wirkstoffs Benzoesäure die folgenden Unterlagen einzureichen sind:

- KIIA 4.5 (Trinkwasser/ ILV)

Die geeignete Analysenmethode von Buttler, 2014 (Studien-Nr. CRA16162) zur Bestimmung von Benzoesäure in Trinkwasser ist durch ein unabhängiges Labor zu validieren (ILV).

Begründung:

Um sicher zu stellen, dass sich vorgeschlagene Analysenverfahren allgemein eignen, ist gemäß der Verordnung (EU) Nr. 283/2013 eine unabhängige Validierung erforderlich.

Vorsorglich weise ich darauf hin, dass bisher mitgeteilte Forderungen bestehen bleiben, soweit sie noch nicht erfüllt sind.

Unterbleibt eine Beanstandung der vorgelegten Gebrauchsanleitung, so ist daraus nicht zu schließen, dass sie als ordnungsgemäß angesehen wird. Die Verantwortung des Zulassungsinhabers für die Übereinstimmung mit dem Zulassungsbescheid bleibt bestehen.

Hinsichtlich der Gebühren erhalten Sie einen gesonderten Bescheid.

Rechtsbehelfsbelehrung

Gegen diesen Bescheid kann innerhalb eines Monats nach Bekanntgabe Widerspruch erhoben werden. Der Widerspruch ist bei dem Bundesamt für Verbraucherschutz und Lebensmittelsicherheit, Messeweg 11/12, 38104 Braunschweig, schriftlich oder zur Niederschrift einzulegen.

Mit freundlichen Grüßen
im Auftrag

gez. Dr. Gerhard Joermann

Dieses Schreiben wurde maschinell erstellt und ist daher ohne Unterschrift gültig.

Anlage

Anlage 1 zugelassene Anwendung: 034407-00/00-001

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	zur Desinfektion / Keine direkte Behandlung der Pflanzen
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-002

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-003

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-004

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Einwirkungszeit: 16 Stunden / Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-005

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-006

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-007

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-008

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-009

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-010

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-011

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-012

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Einwirkungszeit: 16 Stunden / Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-013

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-014

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-015

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-016

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-017

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-018

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-019

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-020

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-021

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung:	Bakterielle und pilzliche Schaderreger, Viren, Viroide
Pflanzen/-erzeugnisse/Objekte:	Kartoffel
Verwendungszweck:	Vermehrungsgut

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-022

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-023

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-024

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-025

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-026

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-027

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-028

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Bundesamt für
Verbraucherschutz und
Lebensmittelsicherheit

Bundesamt für Verbraucherschutz und Lebensmittelsicherheit
Dienstsitz Braunschweig • Postfach 15 64 • 38005 Braunschweig

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IHR ZEICHEN
IHRE NACHRICHT VOM

AKTENZEICHEN 200.22100.034407-00/00.96778
(bitte bei Antwort angeben)

DATUM 1. August 2017

ZV1 034407-00/00

MENNO Florades

Zulassungsverfahren für Pflanzenschutzmittel

Bescheid

Das oben genannte Pflanzenschutzmittel

mit dem Wirkstoff:	90 g/l	Benzoesäure
Zulassungsnummer:	034407-00	
Versuchsbezeichnungen:	MEN-23900-BFV-1-SL	
Antrag vom:	18. Dezember 2013	

wird auf der Grundlage von Art. 29 der Verordnung (EG) Nr. 1107/2009 des Europäischen Parlaments und des Rates vom 21. Oktober 2009 über das Inverkehrbringen von Pflanzenschutzmitteln und zur Aufhebung der Richtlinien 79/117/EWG und 91/414/EWG des Rates (ABl. L 309 vom 24.11.2009, S. 1), wie folgt zugelassen:

Zulassungsende

Die Zulassung endet am 31. Januar 2019.

Festgesetzte Anwendungsgebiete bzw. Anwendungen

Es werden folgende Anwendungsgebiete bzw. Anwendungen festgesetzt (siehe Anlage 1):

Anwendungs-nummer	Schadorganismus/ Zweckbestimmung	Pflanzen/-erzeugnisse/ Objekte	Verwendungszweck
034407-00/00-008, 034407-00/00-009, 034407-00/00-010	Bakterielle und pilzliche Schaderreger	Gemüsekulturen	
034407-00/00-015, 034407-00/00-016, 034407-00/00-017	Bakterielle und pilzliche Schaderreger	Kartoffel	
034407-00/00-022, 034407-00/00-023, 034407-00/00-024	Bakterielle und pilzliche Schaderreger	Tabak	
034407-00/00-001, 034407-00/00-002, 034407-00/00-003	Bakterielle und pilzliche Schaderreger	Zierpflanzen	
034407-00/00-014	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Gemüsekulturen	
034407-00/00-021	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Kartoffel	Vermehrungsgut
034407-00/00-028	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Tabak	
034407-00/00-007	Bakterielle und pilzliche Schaderreger, Viren, Viroide	Zierpflanzen	
034407-00/00-011, 034407-00/00-012, 034407-00/00-013	Viren, Viroide	Gemüsekulturen	
034407-00/00-018, 034407-00/00-019, 034407-00/00-020	Viren, Viroide	Kartoffel	
034407-00/00-025, 034407-00/00-026, 034407-00/00-027	Viren, Viroide	Tabak	
034407-00/00-004, 034407-00/00-005, 034407-00/00-006	Viren, Viroide	Zierpflanzen	

Festgesetzte Anwendungsbestimmungen

Es werden folgende Anwendungsbestimmungen gemäß § 36 Abs. 1 S. 1 des Gesetzes zum Schutz der Kulturpflanzen (Pflanzenschutzgesetz - PflSchG) vom 6. Februar 2012 (BGBl. I S. 148, 1281), zuletzt geändert durch Artikel 4 Absatz 84 des Gesetzes vom 18. Juli 2016 (BGBl. I S. 1666), festgesetzt:

Siehe anwendungsbezogene Anwendungsbestimmungen in Anlage 1, jeweils unter Nr. 3.

Verpackungen

Gemäß § 36 Abs. 1 S. 2 Nr. 1 PflSchG sind für das Pflanzenschutzmittel die nachfolgend näher beschriebenen Verpackungen für den beruflichen Anwender zugelassen:

Verpackungs-art	Verpackungs-material	Anzahl		Inhalt		
		von	bis	von	bis	Einheit
Flasche	HDPE	1		2,00		l
Flasche	HDPE	1		1,00		l
Kanister	HDPE	1		10,00	30,00	l
Trommel, Fass, Tonne	HDPE	1		220,00		l

Die Verpackungen für den beruflichen Anwender sind wie folgt zu kennzeichnen:
Anwendung nur durch berufliche Anwender zulässig.

Auflagen

Die Zulassung wird mit folgenden Auflagen gemäß § 36 Abs. 3 S. 1 PflSchG verbunden:

Kennzeichnungsauflagen:

(EB001-2)
SP 1: Mittel und/oder dessen Behälter nicht in Gewässer gelangen lassen. (Ausbringungsgeräte nicht in unmittelbarer Nähe von Oberflächengewässern reinigen./Indirekte Einträge über Hof- und Straßenabläufe verhindern.)

(SB001)
Jeden unnötigen Kontakt mit dem Mittel vermeiden. Missbrauch kann zu Gesundheitsschäden führen.

(SB110)
Die Richtlinie für die Anforderungen an die persönliche Schutzausrüstung im Pflanzenschutz "Persönliche Schutzausrüstung beim Umgang mit Pflanzenschutzmitteln" des Bundesamtes

für Verbraucherschutz und Lebensmittelsicherheit ist zu beachten.

(SB166)
Beim Umgang mit dem Produkt nicht essen, trinken oder rauchen.

(SE110)
Dicht abschließende Schutzbrille tragen beim Umgang mit dem unverdünnten Mittel.

(SF271)
Kontakt mit behandelten Oberflächen/Geräten erst nach Abtrocknung des Belags.

(SS110)
Universal-Schutzhandschuhe (Pflanzenschutz) tragen beim Umgang mit dem unverdünnten Mittel.

(SS120)
Universal-Schutzhandschuhe (Pflanzenschutz) tragen bei Ausbringung/Handhabung des anwendungsfertigen Mittels.

(SS206)
Arbeitskleidung (wenn keine spezifische Schutzkleidung erforderlich ist) und festes Schuhwerk (z.B. Gummistiefel) tragen bei der Ausbringung/Handhabung von Pflanzenschutzmitteln.

(SS2101)
Schutzanzug gegen Pflanzenschutzmittel und festes Schuhwerk (z.B. Gummistiefel) tragen beim Umgang mit dem unverdünnten Mittel.

(SS610)
Gummischürze tragen beim Umgang mit dem unverdünnten Mittel.

(ST2102)
Halbmaske mit Kombinationsfilter A1-P2 (Kennfarbe: braun/weiß) gemäß BVL-Richtlinie für die Anforderungen an die persönliche Schutzausrüstung im Pflanzenschutz, in der jeweils geltenden Fassung, tragen beim Umgang mit dem unverdünnten Mittel.

Siehe anwendungsbezogene Kennzeichnungsauflagen in Anlage 1, jeweils unter Nr. 2.

Vorbehalt

Dieser Bescheid wird mit dem Vorbehalt der nachträglichen Aufnahme, Änderung oder Ergänzung von Anwendungsbestimmungen und Auflagen verbunden.

Angaben zur Einstufung und Kennzeichnung gemäß Verordnung (EG) Nr. 1272/2008

Signalwort:

(S2) Gefahr

Gefahrenpiktogramme:

(GHS02) Flamme

(GHS05) Ätzwirkung

(GHS07) Ausrufezeichen

(GHS08) Gesundheitsgefahr

Gefahrenhinweise (H-Sätze):

(H226)
Flüssigkeit und Dampf entzündbar.

(H318)
Verursacht schwere Augenschäden.

(H336)
Kann Schläfrigkeit und Benommenheit verursachen.

(H373)
Kann die Organe schädigen <alle betroffenen Organe nennen, sofern bekannt> bei längerer oder wiederholter Exposition <Expositionsweg angeben, wenn schlüssig belegt ist, dass diese Gefahr bei keinem anderen Expositionsweg besteht>.

(EUH 401)
Zur Vermeidung von Risiken für Mensch und Umwelt die Gebrauchsanleitung einhalten.

Sicherheitshinweise (P-Sätze):

(P101)
Ist ärztlicher Rat erforderlich, Verpackung oder Kennzeichnungsetikett bereithalten.

(P102)

Darf nicht in die Hände von Kindern gelangen.

(P210)
Von Hitze, heißen Oberflächen, Funken, offenen Flammen sowie anderen Zündquellenarten fernhalten. Nicht rauchen.

(P260)
Staub/Rauch/Gas/Nebel/Dampf/Aerosol nicht einatmen.

(P271)
Nur im Freien oder in gut belüfteten Räumen verwenden.

(P280)
Schutzhandschuhe/Schutzkleidung/Augenschutz/Gesichtsschutz tragen.

(P305+P351+P338)
BEI KONTAKT MIT DEN AUGEN: Einige Minuten lang behutsam mit Wasser spülen. Eventuell vorhandene Kontaktlinsen nach Möglichkeit entfernen. Weiter spülen.

(P308+P310)
BEI Exposition oder falls betroffen: Sofort GIFTINFORMATIONSZENTRUM oder Arzt anrufen.

(P403+P233)
An einem gut belüfteten Ort aufbewahren. Behälter dicht verschlossen halten.

(P405)
Unter Verschluss aufbewahren.

(P501)
Inhalt/Behälter ... zuführen.

Abgelehnte Anwendungsgebiete bzw. Anwendungen

Für folgende Anwendungsgebiete bzw. Anwendungen lehne ich Ihren Antrag ab (siehe Anlage 2):
- keine -

Hinweise

Auf dem Etikett und in der Gebrauchsanleitung kann angegeben werden:

(NB663)

Aufgrund der durch die Zulassung festgelegten Anwendungen des Mittels werden Bienen nicht gefährdet (B3).

(NN1001)

Das Mittel wird als nicht schädigend für Populationen relevanter Nutzinsekten eingestuft.

(NN1002)

Das Mittel wird als nicht schädigend für Populationen relevanter Raubmilben und Spinnen eingestuft.

Weitere Hinweise und Bemerkungen

Zum Etikett:

Auf dem Etikett ist zusätzlich zum Wirkstoffgehalt anzugeben:

"Enthält ca. 130 g/L 2-Propanol als Lösungsmittel und ca. 40 g/L Ameisensäure als Puffer".

Gemäß Artikel 18 der Verordnung (EG) Nr. 1272/2008 sind alle toxikologisch relevanten Stoffe, die zur Einstufung eines Gemisches beitragen, auf dem Etikett aufzuführen. Folgender Hinweis muss auf dem Etikett erfolgen: "Produktidentifikatoren (Gefahrenbestimmende Komponenten): Ameisensäure (CAS-Nr. 64-18-6), Benzoesäure (CAS-Nr. 65-85-0), Propan-1-ol (CAS-Nr. 71-23-8), 2-Propanol (CAS-Nr. 67-63-0)."

Aufgrund des Kommentars eines cMS sollten in der Gebrauchsanleitung genauere Angaben hinsichtlich der Behandlung zu desinfizierender Flächen und Geräte (Einwirkdauer, Antrocknen des Mittels) gegeben werden.

Zu KIIA 4.5

Ich weise darauf hin, dass spätestens bei der erneuten Genehmigung des Wirkstoffs Benzoesäure die folgenden Unterlagen einzureichen sind:

- KIIA 4.5 (Trinkwasser/ ILV)

Die geeignete Analysenmethode von Buttler, 2014 (Studien-Nr. CRA16162) zur Bestimmung von Benzoesäure in Trinkwasser ist durch ein unabhängiges Labor zu validieren (ILV).

Begründung:

Um sicher zu stellen, dass sich vorgeschlagene Analysenverfahren allgemein eignen, ist gemäß der Verordnung (EU) Nr. 283/2013 eine unabhängige Validierung erforderlich.

Vorsorglich weise ich darauf hin, dass bisher mitgeteilte Forderungen bestehen bleiben, soweit sie noch nicht erfüllt sind.

Unterbleibt eine Beanstandung der vorgelegten Gebrauchsanleitung, so ist daraus nicht zu schließen, dass sie als ordnungsgemäß angesehen wird. Die Verantwortung des Zulassungsinhabers für die Übereinstimmung mit dem Zulassungsbescheid bleibt bestehen.

Hinsichtlich der Gebühren erhalten Sie einen gesonderten Bescheid.

Rechtsbehelfsbelehrung

Gegen diesen Bescheid kann innerhalb eines Monats nach Bekanntgabe Widerspruch erhoben werden. Der Widerspruch ist bei dem Bundesamt für Verbraucherschutz und Lebensmittelsicherheit, Messeweg 11/12, 38104 Braunschweig, schriftlich oder zur Niederschrift einzulegen.

Mit freundlichen Grüßen
im Auftrag

gez. Dr. Gerhard Joermann

Dieses Schreiben wurde maschinell erstellt und ist daher ohne Unterschrift gültig.

Anlage

Anlage 1 zugelassene Anwendung: 034407-00/00-001

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	zur Desinfektion / Keine direkte Behandlung der Pflanzen
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-002

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-003

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-004

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Einwirkungszeit: 16 Stunden / Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-005

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-006

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-007

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Zierpflanzen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Zierpflanzenbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

(WH915)
In die Gebrauchsanleitung ist eine Arten- und/oder Sortenliste der Kulturpflanzen aufzunehmen, für die der vorgesehene Mittelaufwand verträglich ist (Positivliste).

2.3 Wartezeiten

(N)	Gewächshäuser, Räume: Zierpflanzen Die Festsetzung einer Wartezeit ist ohne Bedeutung.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-008

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-009

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-010

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-011

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-012

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Einwirkungszeit: 16 Stunden / Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-013

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-014

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Gemüsekulturen

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Gemüsebau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Gemüsekulturen Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-015

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-016

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-017

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-018

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-019

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-020

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Kartoffel

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-021

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung:	Bakterielle und pilzliche Schaderreger, Viren, Viroide
Pflanzen/-erzeugnisse/Objekte:	Kartoffel
Verwendungszweck:	Vermehrungsgut

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Kartoffel Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-022

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-023

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-024

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 16 Stunden	1 %
- Einwirkungsdauer: 4 Stunden	2 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-025

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Oberflächen von Stellflächen, Gefäßen, Wänden, Maschinen und Gerätschaften etc.
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	spritzen oder schäumen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-026

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Stellflächen und Gefäße
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	gießen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-027

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	versiegelte plane, nicht profilierte Stellflächen
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	fluten
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- leicht zu inaktivierende Erreger	1 %
- mittelschwer zu inaktivierende Erreger	2 %
- schwer zu inaktivierende Erreger	4 %
- Erläuterungen:	Brüheaufwand: 0,8 L/m² / Einwirkungszeit: 16 Stunden / Die Einwirkungsdauer ist Erreger spezifisch und kann gegebenenfalls reduziert werden

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

Anlage 1 zugelassene Anwendung: 034407-00/00-028

1 Anwendungsgebiet

Schadorganismus/Zweckbestimmung: Bakterielle und pilzliche Schaderreger, Viren, Viroide

Pflanzen/-erzeugnisse/Objekte: Tabak

Verwendungszweck:

2 Kennzeichnungsauflagen

2.1 Angaben zur sachgerechten Anwendung

Einsatzgebiet:	Ackerbau
Anwendungsbereich:	Gewächshäuser, Räume
- Erläuterungen:	Schnittwerkzeuge
Anwendung im Haus- und Kleingartenbereich:	Nein
Anwendungszeitpunkt:	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung
Maximale Zahl der Behandlungen	
- in dieser Anwendung:	1
Anwendungstechnik:	tauchen
- Erläuterungen:	Keine direkte Behandlung der Pflanzen / zur Desinfektion
Aufwand:	
- Einwirkungsdauer: 3 Minuten	4 %

2.2 Sonstige Kennzeichnungsauflagen

- keine -

2.3 Wartezeiten

(F)	Gewächshäuser, Räume: Tabak Die Wartezeit ist durch die Anwendungsbedingungen und/oder die Vegetationszeit abgedeckt, die zwischen Anwendung und Nutzung (z. B. Ernte) verbleibt bzw. die Festsetzung einer Wartezeit in Tagen ist nicht erforderlich.

3 Anwendungsbezogene Anwendungsbestimmungen

- keine -

REGISTRATION REPORT
Part B

Section 1: Identity, physical and chemical properties, other information

Detailed summary of the risk assessment

Product code: VP-LF/5 (Menno Florades)

Active Substance: Benzoic acid 90 g/L

Central Zone
Rapporteur Member State: Germany

CORE ASSESSMENT

Applicant: MENNO Chemie-Vertrieb GmbH

Submission Date: 19/12/2013

Date: 01/08/2017

Table of Contents

Introduction

This document summarises the information related to the identity, the physical and chemical properties, the data on application, further information and the classification for the VP-LF/5 (Menno Florades) containing the active substance benzoic acid which was approved according to Regulation (EC) No 1107/2009.

This product was the representative formulation.

The following table provides the EU endpoints to be used in the evaluation.

Agreed EU End-points

End-Point	**Benzoic acid** (Reg. (EU) No 540/2011)
Purity of active substance	min 990 g/kg

Appendix 1 of this document contains the list of references included in this document for support of the evaluation.

Information on the detailed composition of VP-LF/5 (Menno Florades) can be found in the confidential dossier of this submission (Registration Report - Part C).

IIIA 1 IDENTITY OF THE PLANT PROTECTION PRODUCT

IIIA 1.1 Applicant

MENNO Chemie-Vertrieb GmbH
Langer Kamp 104
D-22850 Norderstedt
Germany

Contact:
Telephone number:
Fax number:
E-mail:

IIIA 1.2 Manufacturer of the Preparation, Manufacturer and Purity of the Active Substance(s)

IIIA 1.2.1 Manufacturer(s) of the preparation

MENNO Chemie-Vertrieb GmbH
Langer Kamp 104
D-22850 Norderstedt
Germany

Contact person:
Tel. No.:
Fax No.:
e-mail:

Location of manufacturing plant:

Confidential information - see Part C.

IIIA 1.2.2 Manufacturer(s) of the active substance(s)

Confidential information - data provided separately (Part C).

IIIA 1.2.3 Statement of purity (and detailed information on impurities) of the active substance(s)

Benzoic acid: min 990 g/kg

Further information/justification is provided in Part C.

IIIA 1.3 Trade Names and Manufacturer's Code Numbers for the Preparation

Trade name: MENNO-Florades (Germany)

Company code number: VP-LF/5, MEN-23900-BVF-0-SL

IIIA 1.4 Detailed Quantitative and Qualitative Information on the Composition of the Preparation

IIIA 1.4.1 Content of active substance and formulants

The formulation was the representative formulation.

Pure active substance:

content of pure benzoic acid:	90 g/L
limits benzoic acid:	± 10 %: 81 g/L to 99 g/L

Technical active substance:

content of technical benzoic acid at minimum purity (99.0 %):	90.9 g/L	(9.08 % w/w)
FAO limits benzoic acid:	± 10 %: 81.9 g/L to 99.9 g/L	

None of the active substances in the formulation are present in the form of a salt, ester, anion or cation. Further information on the active substances and on the certified limits of formulants is considered confidential (see Part C).

IIIA 1.4.2 Certified limits of each component

This is not an EC data requirement/ not required by regulation (EU) 2011/545.

IIIA 1.4.3 Common names and code numbers for the active substance(s)

Data Point	Type	Name/Code Number
1.4.3.1	ISO common name	Benzoic acid
1.4.3.2	CAS No.	65-85-0
1.4.3.2	EINECS No.	200-618-2
1.4.3.2	CIPAC No.	622
1.4.3.2	ELINCS	–
1.4.3.3	Salt, ester anion or cation present	–

IIIA 1.4.4 Co-formulant details: identity, structure, codes, trade name, specification and function.

CONFIDENTIAL information - data provided separately (Part C).

IIIA 1.4.5 Formulation process

IIIA 1.4.5.1 Description of formulation process

This is not an EC data requirement/ not required regulation (EU) 2011/545.

IIIA 1.4.5.2 Discussion of the formation of impurities of toxicological concern

Benzoic acid does not contain any impurities of toxicological or ecotoxicological concern.

IIIA 1.5 Type of Preparation and Code

Type : soluble concentrate Code : SL

IIIA 1.6 Function

The product will be used as disinfectant (bactericide, fungicide, virucide, viroicide)

IIIA 1.7 Other/Special Studies

None.

IIIA 2 PHYSICAL, CHEMICAL AND TECHNICAL PROPERTIES OF THE PLANT PROTECTION PRODUCT

VP-LF/5 (Menno Florades) was the representative formulation during the first EU review process and is the representative formulation for the renewal process. The product has been previously evaluated according to Uniform Principles. All submitted studies were already evaluated during the EU process are described in the RAR for benzoic acid and are not evaluated again.

The datagap regarding the boiling point of the formulation addressed in to the Peer review of the pesticide risk assessment of the active substance benzoic acid (EFSA Journal 2016;14 (12):4657) remains.

The product MENNO Florades is a SL-formulation. The appearance of the product is that of a clear, yellowish liquid. It is not explosive, has no oxidising properties. It has a self-ignition temperature of 435 °C and a flash point of 19.2 °C. The pH of a 1% solution in water is 3.0 at 19.8 °C. The surface tension is 53.4 mN/m at 20 °C, the density is 0.999 g/cm³ at 20 °C and the dynamic viscosity is 5.5 mPas at 40 °C. MENNO Florades is a Newtonian liquid The stability data indicate a shelf life of at least 5 years at ambient temperature in PE packaging. Its technical characteristics are acceptable for a SL-formulation.

The recommended use rates are between 1 % and 4 %.

Experimental testing of the product's physico-chemical and technical characteristics:

See Appendix 3

Implications for labelling:

No labelling necessary due to physical or chemical properties described above.

For the sake of completeness, the following table containing the evaluation of the physical, chemical and technical properties of the plant protection product MENNO Florades was inserted (RAR Benzoic acid, Dez. 2015, Volume 3 – B.2 (PPP) – Menno Florades, rev. Aug 2016).

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.1 Appearance						
Physical state and colour B.2.1/01	Visual method	MENNO Florades Batch / lot no.: 9601 / 9803 / 9804 Content: 90 g a.i./kg (nom.)	Measured at: Batch 9601: 0, 27 and 68 months Batch 9803: 0 and 65 months Batch 9804: 0 and 65 months Results for all: Liquid with a clear yellowish colour.	**Acceptable**	N	KCP 2.1/01 (Kellner 2005)
	Visual method	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	The test item was a slightly turbid, light yellow liquid with an alcoholic odour.	**Acceptable**	Y	KCP-2.1/02 (Bockholt, 2015)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.2 Explosive and oxidising properties						
Explosive and oxidising properties B.2.2/01-02	n.a.	n.a.	According to the chemical structure explosive properties are not expected. Shock, friction or pressure do under no circumstances induce an explosion of the liquid preparation, as can be deducted from the well-known properties of the formulants (organic solvents, acids and surfactants). However, it is well known that the vapours of flammable organic solvents may ignite or explode. Therefore, all precautions have to be taken to avoid sparks, electrostatic discharge or open fire when handling the preparation.	**Acceptable** **It is a theoretical assessment.**	N	
B 2.3 Flammability and self-heating						
Flash point B.2.3/01	DIN 51755 (comparable EEC method A9)	Menno Florades	Flashpoint: 28.5 °C	**not acceptable**	N	KCP-2.3/01 (Anonymous 1994)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	EC A9	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	Flashpoint: 19.2°C (barometric pressure 100.7 kPa)	**Acceptable**	Y	KCP-2.3/03 (Bockholt, 2015)
Self-heating of formulation B.2.3/02	EEC method A15	MENNO Florades Batch / lot no.: 9903 Content: 90 g a.i./kg (nom.)	Auto-ignition temperature: 435 C	**Acceptable**	Y	KCP-2.3/02 (Angly 2000)
	EC A15	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	The auto ignition temperature of the test item was determined to be 440°C.	**Acceptable** **This result is handled as supporting information.**	Y	KCP-2.3/03 (Bockholt, 2015)
B 2.4 Acidity/alkalinity and pH value						
Acidity/alkalinity and pH value B.2.4/01-02	CIPAC guideline MT 191	MENNO Florades Batch / lot no.: 07005 Content: 90 g a.i./kg (nom.), 9.04 % (w/w) (analytically)	Mean of three measurements: Acidity: 5.69 % (calculated as H_2SO_4) (SD: 0.3 %)	**Acceptable**	Y	KCP-2.4/01 (Fieseler, 2008c)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	CIPAC MT 75.3	MENNO Florades Batch / lot no.: 9601 / 9803 / 9804 Content: 90 g a.i./kg (nom.)	pH-value of the product/concentrate, batch: 9601 after 0 month: 2.47 after 27 month: 2.50 after 68 month: 2.47 pH-value of 1 % product solution, batch. 9803: after 0 month: 3.00 ± 0.60 (according to specification) after 68 month: 3.23 pH-value of 1 % product solution, batch: 9804: after 0 month: 3.00 ± 0.60 (according to specification) after 68 month: 3.33	**Acceptable** **This result is handled as supporting information.**	N	KCP 2.4/02 (Kellner 2005)
	Not stated	MENNO Florades Batch / lot no.: 9507 Content: 90 g a.i./kg (nom.)	pH-value of 1 % product solution after 0 days: 2.63 / 2.64 after 14 days (54 °C): 2.90 / 2.89	**Acceptable** **This result is handled as supporting information.**	N	KCP 2.4/03 (Anonymous 1996b)
	Not stated	MENNO Florades Batch / lot no.: 9507 Content: 90 g a.i./kg (nom.)	pH-value of 1 % product solution after 0 days: 2.63 / 2.64 after 7 days (0 °C): 2.79 / 2.78	**Acceptable** **This result is handled as supporting information.**	N	KCP 2.4/04 (Anonymous 1996c)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	CIPAC MT 75.3	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	Test item in 1 % m/v solution in deionised water: pH after 0 days: 3.0 (19.8 °C) pH after 8 weeks at 40°C: 3.0 (19.8 °C)	**Acceptable**	Y	KCP-2.4/05 (Bockholt, 2015)
	CIPAC MT 191	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	Acidity at day 0: 6.00 % calculated as H_2SO_4 Acidity after 8 weeks at 40°C: 5.89 % calculated as H_2SO_4	**Acceptable**	Y	KCP-2.4/05 (Bockholt, 2015)
B 2.5 Viscosity and surface tention						
Viscosity B.2.5/01	CIPAC guideline MT 192 OECD guideline 114	MENNO Florades Batch / lot no.: 07005 Content: 90 g a.i./kg (nom.) 9.04 % (w/w) (analytically)	Viscosity: 8 mPa at 20 °C ± 0.1 °C 5.5 mPas at 40 °C ± 0.1 °C MENNO Florades is a Newtonian fluid	**Acceptable** **The authors concluded that the viscosity was constant (± 2 mPas) at different shear rates (500-2000 s^{-1}). Thus, they considered MENNO Florades as Newtonian fluid.** **This result is handled as supporting information.**	**Y**	KCP-2.5/01 (Fieseler, 2008e)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	OECD 114	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	The test item was a non-Newtonian shear thinning liquid. The dynamic viscosity of the test item at 25°C ± 0.1°C and at 40°C ± 0.1°C measured by rotational viscometry according to ISO 3219 could be described by the following equations: 25°C: viscosity [mPas] = 132.73 * (shear rate [s^{-1}]) $^{-0.675}$ (range 1.03 s^{-1} to 258 s^{-1}) 40°C: viscosity [mPas] = 223.6 * (shear rate [s^{-1}]) $^{-0.812}$ (range 1.03 s^{-1} to 258 s^{-1}) The minimum viscosities observed were: 25°C: 5.7 mPas (258 s^{-1}) 40°C: 3.9 mPas (258 s^{-1})	**Acceptable** **Shear rates were smaller by orders of magnitude, compared to the first study (1-258 s^{-1}, 8 steps). The authors found that the viscosity of the test item was extremely dependent on the shear rate applied for measurement. Thus, MENNO Florades was clearly identified as non-Newtonian fluid.**	Y	KCP-2.5/03 (Bockholt, 2015)
Surface tension B.2.5/02	EEC method A.5	MENNO Florades Batch / lot no.: 9903 Content: 90 g a.i./kg (nom.)	Surface tension: 53.4 mN/m ± 1.76 mN/m (mean) (0.1 w/v % at 20 °C within 30 min)	**Acceptable**	Y	KCP-2.5/02 (Schulz, 2000)
	OECD 115, Method EC A5	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	The averaged surface tension of the neat test item at 25°C was determined to be 27.2 mNm.	**Acceptable** **This result is handled as supporting information.**	Y	KCP-2.5/03 (Bockholt, 2015)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.6 Relative density and bulk density						
Relative density and bulk density B.2.6/01	EEC method A.3	MENNO Florades Batch / lot no.: 07005 Content: 90 g a.i./kg (nom.) 9.04 % (w/w) (analytically)	Relative density: 0.999 g/cm³ ± 0.0008 g/cm³ (20.0°C ± 0.3 °C)	**Acceptable**	Y	KCP 2.6/01 (Fieseler, 2008d)
	OECD 109	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	The density of the test item at 20°C by the oscillating density meter was 0.9996 g/cm^3 = 999.6 kg/m^3.	**Acceptable** **This result is handled as supporting information.**	Y	KCP-2.6/02 (Bockholt, 2015)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.7	**Storage Stability and shelf-life: effects of temperature on technical characteristics of the plant protection product**					

<table>
<tr><th>Test or study & Data point</th><th>Guideline and method</th><th>Test material purity and specification</th><th>Used methods/Results</th><th>Comments (acceptable/Non acceptable)</th><th>GLP Y/N</th><th>Reference</th></tr>
<tr><td>Storage Stability and shelf-life: effects of temperature on technical characteristics of the plant protection product B.2.7/01</td><td>Not stated</td><td>MENNO Florades
Batch / lot no.: 9601 / 9803 / 9804
Content:
90 g a.i./kg (nom.)</td><td>The proposed packaging is PE.

<table>
<tr><td></td><td colspan="3">Concentration [%]</td></tr>
<tr><td>Batch no.</td><td>0 months</td><td>27 months</td><td>65/68 months</td></tr>
<tr><td>9601</td><td>9.17</td><td>9.02</td><td>8.88</td></tr>
<tr><td>9803</td><td>9.00 *</td><td>--</td><td>9.00</td></tr>
<tr><td>9804</td><td>9.00 *</td><td>--</td><td>9.09</td></tr>
</table>
* according to specification

The content of the active ingredient benzoic acid in MENNO Florades was determined by analytical method C 17.2. (The description and the validation of the analytical method can be found in Vol.3 CA B.5.1.2 – Ref. Point: KCA 4.1.2/01.)

<table>
<tr><td></td><td colspan="3">Appearance, colour</td></tr>
<tr><td>Batch no.</td><td>0 months</td><td>27 months</td><td>65/68 months</td></tr>
<tr><td>9601</td><td>clear yellowish liquid</td><td>clear yellowish liquid</td><td>clear yellowish liquid</td></tr>
<tr><td>9803</td><td>clear yellowish liquid</td><td>--</td><td>clear yellowish liquid</td></tr>
<tr><td>9804</td><td>clear yellowish liquid *</td><td>--</td><td>clear yellowish liquid</td></tr>
</table>

<table>
<tr><td></td><td colspan="3">pH</td></tr>
<tr><td>Batch no.</td><td>0 months</td><td>27 months</td><td>65/68 months</td></tr>
<tr><td>9601</td><td>2.47</td><td>2.50</td><td>2.47</td></tr>
<tr><td>9803</td><td>3.00</td><td>--</td><td>3.23</td></tr>
<tr><td>9804</td><td>3.00</td><td>--</td><td>3.33</td></tr>
</table>
</td><td>Acceptable
The test of solution stability was not performed before and after storage.</td><td>N</td><td>KCP 2.7/01
(Kellner 2005)</td></tr>
<tr><td></td><td>ertrieb GmbH</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	Not stated	MENNO Florades Batch / lot no.: 9507 Content: 90 g a.i./kg (nom.)	Concentration [%] after storage at 54 °C: after 0 days: 9.36 / 9.42 after 14 days (54 °C): 8.96 / 9.61	**Acceptable** **This result is handled as supporting information.**	N	KCP 2.7/02 (Anonymous)1996b
	Not stated	MENNO Florades Batch / lot no.: 9507 Content: 90 g a.i./kg (nom.)	Concentration [%] after storage at 0 °C: after 0 days: 9.36 / 9.42 after 7 days (0 °C): 9.22 / 9.17	**Acceptable** **This result is handled as supporting information.**	N	KCP 2.7/03 (Anonymous 1996c)
	CIPAC MT 46.3	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	No separated material was observed after 8 weeks storage at 40°C: No corrections for solvent losses over storage at 40°C had to be made.	**Acceptable**	Y	KCP-2.7/04 (Bockholt, 2015)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	CIPAC MT 39.3	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	Small traces of sediment were observed after 7 days storage at 0°C. The amount was quantified to 0.40 mL/100 mL equivalent to 0.4 %v/v. Two similar samples kept at ambient temperature for 24 h afforded 0.55 mL of sediment that could be re-homogenized by shaking. The formation of sediment was a typical property of the test item. Storage at 0°C appeared to have no influence on the formation of sediments.	**Acceptable**	Y	KCP-2.7/04 (Bockholt, 2015)
B 2.8 Technical characteristics of the plant protection product						
B 2.8.1 Wettability						
Wettability B.2.8.1/01			Not required for SL formulation			
B 2.8.2 Persistence of foaming						
Persistence of foaming B.2.8.2/01			No test was performed but practical experience during the efficacy studies revealed that no excessive foaming occurred while pouring of spraying. Application method coarse-spray: No foaming process does occur.	**Not acceptable**		KCP-2.8.2/01 (Kral 2012)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	CIPAC MT 47.2	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	After an initial 10 seconds a foam volume of 34 mL was observed for the 1 %v/v sample which collapsed to 0 mL volume within 12 minutes. The relevant value after 1 minute was 21 mL. After an initial 10 seconds a foam volume of 60 mL was observed for the 4 %v/v sample which collapsed to 53 mL volume within 12 minutes. The relevant value after 1 minute was 57 mL.	**Acceptable**	Y	KCP-2.8.2/02 (Bockholt, 2015)
B 2.8.3 Suspensibility, spontaneity and dispersion stability						
Suspensibility, spontaneity and dispersion stability B.2.8.3/01			Not required for SL formulation			
B 2.8.4 Degree of dissolution and dilution stability						
Degree of dissolution and dilution stability B.2.8.4/01	CIPAC guideline MT 18 CIPAC guideline MT 41	MENNO Florades Batch / lot no.: VP-FL/4/7, VP-FL/4/8 Content: 90 g a.i./kg (nom.)	The solution was stable at concentrations of 2 %, 4 % (highest recommended dose rate) and 5 %.	**Acceptable**	N	KCP-2.8.4/01 (Kellner 2000)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
	CIPAC MT 41	MENNO Florades Batch / lot no.: 14010 Content: 90 g a.i./L (nom.) 92.4 g a.i/L ± 0.27 g a.i./L (anal., n=5)	Solutions of the test item as received and after 8 weeks storage at 40°C afforded slightly turbid solutions with traces of sediment (1 %m/v) and turbid solutions with sediments (4 %m/v) by visual inspection. The amount of separated material in the test item solution of 1 %v/v in standard water D was 0.016 %m/m before and 0.031 %m/m after storage for 8 weeks at 40°C. The amount of separated material in the test item solution of 4 %v/v in standard water D was 0.082 %m/m before and 0.037 %m/m after storage for 8 weeks at 40°C. Sediments <0.1% were considered as traces and therefore the results were considered acceptable, especially since the amount of sediment decreased for the 4% test solution after storage at 40°C.	**Acceptable** **This result is handled as supporting information.**	Y	KCP-2.8.4/02 (Bockholt, 2015)

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.8.5 Particle size distribution, dust content, attrition and mechanical stability						
B 2.8.5.1 Particle size distribution						
Particle size distribution B.2.8.5.1/01			Not required for SL formulation			
B 2.8.5.2 Dust content						
Dust content B.2.8.5.2/01			Not required for SL formulation			
B 2.8.5.3 Attrition						
Attrition B.2.8.5.3/01			Not required for SL formulation			
B 2.8.5.4 Hardness and integrity						
Hardness and integrity B.2.8.5.4/01			Not required for SL formulation			

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.8.6 Emulsifiability, re-emulsifiability, emulsion stability						
Emulsifiability, re-emulsifiability, emulsion stability B.2.8.6/01			Not required for SL formulation			
B 2.8.7 Flowability, pourability and dustability						
Flowability, pourability and dustability B.2.8.7/01			Not required for SL formulation			
B 2.9 Physical and chemical compatibility with other products including other plant protection products with which its use is to be authorised						
Physical and chemical compatibility with other products including other plant protection products with which its use is to be authorised B.2.9/01			Not required since tank mixtures are not recommended.			

Test or study & Data point	Guideline and method	Test material purity and specification	Used methods/Results	Comments (acceptable/Non acceptable)	GLP Y/N	Reference
B 2.10 Adherence and distribution to seeds						
Adherence and distribution to seeds B.2.10/01			Not required since the formulation is not for seed treatment.			
B 2.11 Other studies						
Other studies						
Boiling point				**Data requirement** For a proper CLP classification on flammability the boiling point of the product has to be determined. According to the applicant the study is ongoing and will be submitted by October 2016.		

IIIA 3 DATA ON APPLICATION OF THE PLANT PROTECTION PRODUCT

IIIA 3.1 Field of Use

Insert information.

IIIA 3.2 Nature of the Effects on Harmful Organisms

Insert information on mode of action and effects.

IIIA 3.3 Details of Intended Use

IIIA 3.3.1 Details of existing and intended uses

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.3.2 Details of harmful organisms against which protection is afforded

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.3.3 Effects achieved

Please refer to Part B Section 7.

IIIA 3.4 Proposed Application Rates (Active Substance and Preparation)

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.5 Concentration of the Active Substance in the Material Used

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.6 Method of Application, Type of Equipment Used and Volume of Diluent

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.7 Number and Timings of Applications, Timing, Growth Stages (of Crop and Harmful Organism) and Duration of Protection

IIIA 3.7.1 Maximum number of applications and their timings

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.7.2 Growth stages of crops or plants to be protected

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.7.3 Development stages of the harmful organism concerned

Please refer to Appendix 2 - Critical Uses - and Part B Section 7.

IIIA 3.7.4 Duration of protection afforded by each application

Please refer to Part B Section 7.

IIIA 3.7.5 Duration of protection afforded by the maximum number of applications

Please refer to Part B Section 7.

IIIA 3.8 Necessary Waiting Periods or Other Precautions to Avoid Phytotoxic Effects on Succeeding Crops

IIIA 3.8.1 Minimum waiting periods or other precautions between last application and sowing or planting succeeding crops

Please refer to Part B Section 7.

IIIA 3.8.2 Limitations on choice of succeeding crops

Please refer to Part B Section 7.

IIIA 3.8.3 Description of damage to rotational crops

Please refer to Part B Section 7.

IIIA 3.9 Proposed Instructions for Use as Printed on Labels

Please refer to Registration Report – Part A, Appendix 2 for the relevant country.

IIIA 3.10 Other/Special Studies

This is not an EC data requirement/ not required by Directive 91/414/EEC.

IIIA 4 FURTHER INFORMATION ON THE PLANT PROTECTION PRODUCT

IIIA 4.1 Packaging and Compatibility with the Preparation

This product was the representative formulation. The product has been previously evaluated according to Uniform Principles.

Packaging Summary
Information with regard to type, dimensions, capacity, size of opening, type of closure, strength, leakproofness, resistance to normal transport & handling, resistance to & compatibility with the contents of the packaging, have been submitted, evaluated and is considered to be acceptable.

IIIA 4.1.1 Description and specification of the packaging

VP-LF/5 (Menno Florades)is to be marketed in high-density polyethylene containers. They are protected by screw caps of polyethylene.

1 litre bottle:	material:	HDPE
	shape/size:	72 mm x 91 mm x 210 mm
	opening:	20 mm diameter
	closure:	polyethylene screw cap
	seal:	none
2 litre bottle:	material:	HDPE
	shape/size:	111 mm x 120 mm x 272 mm
	opening:	43.5 mm diameter
	closure:	polyethylene screw cap

	seal:	none
10 litre jerry can:	material:	HDPE
	shape/size:	200 mm x 232 mm x 322 mm
	opening:	49.6 mm diameter
	closure:	polyethylene screw cap
	seal:	none
20 litre jerry can:	material:	HDPE
	shape/size:	290 mm x 259 mm x 386 mm
	opening:	59 mm diameter
	closure:	polyethylene screw cap
	seal:	none
30 litre jerry can:	material:	HDPE
	shape/size:	297 mm x 370 mm x 420 mm
	opening:	59.2 mm diameter
	closure:	polyethylene screw cap
	seal:	none
220 litre drum:	material:	HDPE
	shape/size:	Cylindrical/ diameter 581 mm x hight 935 mm
	opening:	50.8 mm diameter
	closure:	polyethylene screw cap
	seal:	none

IIIA 4.1.2 Suitability of the packaging and closures

Strength, leakproofness and resistance to normal transport and handling are ensured by the certificates given in Appendix I.

IIIA 4.1.3 Resistance of the packaging material to its contents

Report:	Kellner, G., 2005
Title:	Shelf Life Following Storage at Ambient Temperature over 65 resp. 68 months with MENNO Florades
Document No:	CC05D04
Guidelines:	Manual on Development and Use of FAO Specifications for Plant Protection Products (Jan. 1999)
GLP	Yes

The active substance and the formulants are well-known chemicals. Any packaging material specified for acids and for halogen free organic solvents is suitable for packaging the preparation. Therefore, no special packaging material is necessary for MENNO Florades.

A storage stability test over 65 resp. 68 months demonstrates the resistance of the packaging material PE to MENNO Florades.
As packaging made of PE is stable it can be concluded that HDPE is also suitable.

IIIA 4.2 Procedures for Cleaning Application Equipment

IIIA 4.2.1 Procedures for cleaning application equipment and protective clothing

Cleaning with tap water is recommended if necessary. All formulants are water soluble or miscible. Any household detergent may be used to intensify the cleaning procedure. Practical experience shows that no residues remain on washed surfaces. Protective clothing may, if allowed by the manufacturer, be washed in a household washing machine without special precautions. Because washing powder usually is slightly alkaline, the removal of benzoic acid as salt is easily accomplished.

IIIA 4.2.2 Effectiveness of the cleaning procedures

No data considered necessary (refer to IIIA-4.2.1).

IIIA 4.3 Re-entry Periods to Protect Man, Livestock and the Environment

IIIA 4.3.1 Pre-harvest interval (in days) for each relevant crop

See section 4.

IIIA 4.3.2 Re-entry period (in days) for livestock, to areas to be grazed

See section 4.

IIIA 4.3.3 Re-entry period (in hours or days) for man to crops, buildings or spaces treated

See section 4.

IIIA 4.3.4 Withholding period (in days) for animal feeding stuffs

See section 4.

IIIA 4.3.5 Waiting period (in days) between application and handling of treated products

See section 4.

IIIA 4.3.6 Waiting period (in days) between last application and sowing or planting succeeding crops

See section 4.

IIIA 4.3.7 Information on specific conditions under which the preparation may or may not be used

See section 4.

IIIA 4.4 Statement of the Risks Arising and the Recommended Methods and Precautions and Handling Procedures to Minimise Those Risks

Report:	Anonymous, 2012
Title:	Safety data sheet MENNO FLORADES
Document No:	None
Guidelines:	EC 1907/2006
GLP	No, not subject to GLP regulations

The safety data sheet complies with actual EEC regulations and is based on the present state of knowledge.

IIIA 4.4.1 Warehouse storage

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.4.2 User level storage

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.4.3 Transport

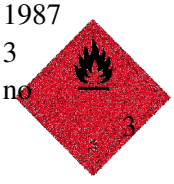
Land transport (ADR/RID)

UN number 1987
ADR/RID class 3
Classification code F1
Warnings plate:

Hazard-no.: 30
Hazard label: 3
ADR/RID packaging group: III
Limited quantity LQ 7
Tunnel restriction code D/E
Description of the goods: Alcohols, n.o.s., (n-Propanol + Propan-2-ol, Solution)
Other applicable information
(land transport): Limited quantity:
Maximum receptacle size
(inner packaging): 5 litres
Maximum tray size: 30 kg

Marine transport

UN number: 1987
IMDG code: 3
Marine pollutant: no
Hazard label:



EMS:	F-E, S-D
IMDG packaging group:	III
Description of the goods	Alcohols, n.o.s., (n-Propanol + Propan-2-ol, Solution)
Other applicable information (marine transport):	Limited quantity:
Maximum receptacle size (inner packaging):	5 litres
Maximum tray size:	30 kg

Air transport

UN/ID number		1987
ICAO/IATA-DGR		3
Hazard label:		3

ICAO packaging group	III
IATA packing instructions – Passenger	309
IATA packing instructions – Cargo	310
Description of the goods	Alcohols, n.o.s., (n-Propanol + Propan-2-ol, Solution)

IIIA 4.4.4 Fire

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.4.5 Nature of protective clothing proposed

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H..

IIIA 4.4.6 Characteristics of protective clothing proposed

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.4.7 Suitability and effectiveness of protective clothing and equipment

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.4.8 Procedures to minimise the generation of waste

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.4.9 Combustion products likely to be generated in the event of fire

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.5 Detailed Procedures for Use in the Event of an Accident During Transport,

Storage or Use

IIIA 4.5.1 Containment of spillages

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.5.2 Decontamination of areas, vehicles and buildings

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.5.3 Disposal of damaged packaging, adsorbents and other materials

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.5.4 Protection of emergency workers and bystanders

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.5.5 First aid measures

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.6 Neutralisation Procedure for Use in the Event of Accidental Spillage

IIA 4.6.1 Details of proposed procedures for small quantities

The preparation contains some free acid, which may be neutralized with any kind of alkali. However, this procedure is not recommended for small and large quantities because the surplus of alkali poses at least the same risk than the free acids, which are only slightly acidic. The best way to handle accidental spillage is to dilute the preparation with water. This minimises the risk of ignition as well as the risk of skin and eye irritation.

IIIA 4.6.2 Evaluation of products of neutralization (small quantities)

Alkali salts of Benzoic acid and diluted free Benzoic acid.

IIIA 4.6.3 Procedures for disposal of small quantities of neutralized waste

Small quantities of neutralized waste may be disposed off with the domestic waste.

IIIA 4.6.4 Details of proposed procedures for large quantities

The preparation contains some free acid, which may be neutralized with any kind of alkali. However, this procedure is not recommended for small and large quantities because the surplus of alkali poses at least the same risk than the free acids, which are only slightly acidic. The best way to handle accidental spillage of larger quantities is to soak up the spillage with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust) and dilute the remaining preparation with water. This minimises the risk of ignition as well as the risk of skin and eye irritation.

IIIA 4.6.5 Evaluation of products of neutralization (large quantities)

Alkali salts of Benzoic acid and diluted free Benzoic acid.

IIIA 4.6.6 Procedures for disposal of large quantities of neutralized waste

Package product wastes. Close and label waste receptacles and, likewise, any not cleaned empty containers. Dispose of them at a suitable waste incineration plant in accordance with the official regulations.
Waste disposal number of waste from residues, used and unused product: 020108 (Agrochemical waste containing dangerous substances). Classified as hazardous waste.
Where large quantities are concerned, consult the supplier.

IIIA 4.7 Pyrolytic Behaviour of the Active Substance

Not applicable since the product does not contain organic halogens. No polyhalogenated dibenzo-p-dioxins do occur.

IIIA 4.8 Disposal Procedures for the Plant Protection Product

IIIA 4.8.1 Detailed instructions for safe disposal of product and its packaging

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.8.2 Methods other than controlled incineration for disposal

Please refer to the Material Safety Data Sheet for the product MENNO Florades in document H.

IIIA 4.9 Other/Special Studies

No additional studies were performed.

IIIA 11 FURTHER INFORMATION

IIIA 11.1 Information of Authorisations in Other Countries

see EU pesticide data base (http://ec.europa.eu/sanco_pesticides/public/)

IIIA 11.2 Information on Established Maximum Residue Limits (MRL) in Other Countries

MRLs are set at European level, see Regulation (EC) No. 396/2005.

IIIA 11.3 Justified Proposals for Classification and Labelling

Proposals for classification and labelling of MENNO Florades in accordance with Regulation (EC) No 1272/2008 are presented below:

Physico-chemical properties

Table 11.3-1 Physico-chemical properties

Study Type	Findings (triggered risk phrase)	Reference
Explosivity	Not explosive. However, it is well known that the vapours of flammable organic solvents may ignite or explode. Therefore, all precautions have to be taken to avoid sparks, electrostatic discharge or open fire when handling the preparation.	DAR, Annex B.2.1.13, p. 15
Oxidizing properties	Not oxidizing.	DAR, Annex B.2.1.15, p. 15
Flashpoint	19.2 °C	RAR, Annex B.2.3, page 6
Flammability	Auto-ignition temperature is 435°C	Angly, 2000
Content of hydrocarbon	< 10 % (w/w)	Part C
Viscosity (dynamic)	shear rate = 1000 s^{-1}: 20 °C: 8 mPa s 40 °C: 5.5 mPa s	Fieseler, 2008e
Surface tension	neat product: 53.4 mN/m	Schulz, 2000

GHS02 (flame), H225

Toxicology

see section 3.

Ecotoxicology/Environment

Based on the ecotoxicological properties of the product, any classification and labelling with regard to the environment is not necessary. Justification for acute hazard: based on test data, as regards section 4.1.3.3 of CLP Regulation. Justification for chronic hazard: summation method, as regards section 4.1.3.5.5 of CLP Regulation.

Relevant toxicity	Active substance: benzoic acid (content 90 g/L) LC_{50} > 100 mg product/L_{nom} (*Brachydanio rerio*) EC_{50} = 255 mg product/L_{nom} (*Daphnia magna*) E_rC_{50} > 1000 mg product/L_{mm} (*Desmodesmus subspicatus*) NOEC > 120 mg a.s./L (fish, 28 d, ECHA)
Classification and labelling according to Regulation 1272/2008	
Hazard symbol	Not relevant*
Signal word	No signal word used

Hazard statement	Not relevant*

*please refer to the relevant toxicity data.

Supplement hazard information compulsory for every PPP:

EUH401	To avoid risks to man and the environment, comply with the instructions for use.

IIIA 11.4 Proposals for Risk and Safety Phrases

Please refer to Registration Report – Part A.

IIIA 11.5 Proposed Label

Please refer to Registration Report – Part A.

IIIA 11.6 Specimens of Proposed Packaging

Specimens of the packaging were not provided as there was no request.

Appendix 1: List of data used in support of the evaluation

Annex point/ reference No. OECD	Author(s)	Year	Title Source (where different from company) Report-No. GLP or GEP status (where relevant)	Data protection claimed	Owner	How considered in dRR Study-Status / Usage*
KIIIA1 2.1, KIIIA1 2.4.2, KIIIA1 2.6.1, KIIIA1 2.7.5, KIIIA1 2.7.6	Kellner, G.	2005	Shelf Life Following Storage at Ambient Temperature over 65 resp. 68 months with MENNO Florades, CC05D04, GLP: Y, published: N Y MEN	Y	MEN	3, already evaluated in EU process
KIIIA1 2.4.1	Fieseler, A.		Determination of the Acidity or Alkalinity of MENNO Florades 43961349 GLP: Y, published: N	Y	MEN	3, already evaluated in EU process
KIIIA1 2.5.2	Fieseler, A.		Determination of the Viscosity of MENNO Florades 43963196 GLP: Y, published: N	Y	MEN	3, already evaluated in EU process
KIIIA1 2.6.1	Fieseler, A	2008	Determination of the Relative Density of MENNO Florades, 43962182, GLP: Y, published: N	Y	MEN	3, already evaluated in EU process
KIIIA1 2.8.2	Keller, G., Kral, G.	2012	MENNO Florades, Zulassungsnummer 4407-00/xx, Applikation als Schaum [MENNO Florades, Reg.No. 4407-00/xx, Application as coarse spray] - e-mail, None, GLP: N, published: N	Y	MEN	3, already evaluated in EU process
KIIIA1 4.1.1	Anonymous	2000	[redacted] specification: packages ([redacted] Spezifikation Verpackungsmittel: 1050 ml Flasche,dunkelgrün/Menno)	Y	MEN	1

Annex point/ reference No. OECD	Author(s)	Year	Title Source (where different from company) Report-No. GLP or GEP status (where relevant)	Data protection claimed	Owner	How considered in dRR Study-Status / Usage*
KIIIA1 4.1.1	Anonymous	2000	[redacted] specification: packages ([redacted] Spezifikation Verpackungsmittel: 10x1L Karton m. UN-Zul. and further information	Y	MEN	1
KIIIA1 4.1.1	Anonymous	1993	Specification (Spezifikation: Kindersicherheitsverschluss - Kappe, Schraubteil Rd 25)	Y	MEN	1
KIIIA1 4.1.1	Wienecke, B.-U., Nieruch, A.	2008	[redacted] correction, certificate of approval (Korrektur 48519.1, Zulassungsschein) and further information	Y	MEN	1
KIIIA1 4.1.1	Bosma, M.	2007	[redacted] specification: packages ([redacted] Spezifikation Verpackungsmittel - 2000ml Griffflasche/Orig.Gew./blau, HDPE B5823 up to 5L	Y	MEN	1
KIIIA1 4.1.1	Anonymous	2006	[redacted] specification packages (Spezifikation Verpackungs-mittel - Rasterverschluß für Folienbeutel, Deckel SK 51 OV-U, Spectum, technical data sheet, declarations of compliance and masterbatch)	Y	MEN	1
KIIIA1 4.1.1	Anonymous	2004	[redacted] specification packages (Spezifikation Verpackungs-mittel - 10 L Kanister, blau, UN-Zul., certificate of approval for packaging of type 3Hl plastic jerry can of 10 + 12 L)	Y	MEN	1
KIIIA1 4.1.1	Spies, St., Strohmann, D.	2005	Technical datasheet (AST Kunststoffverarbeitung - Technisches Datenblatt EST 20.07 - 20 Liter, certificate of approval 3H1 plastic jerry can 20 and 25 L)	Y	MEN	1

Annex point/ reference No. OECD	Author(s)	Year	Title Source (where different from company) Report-No. GLP or GEP status (where relevant)	Data protection claimed	Owner	How considered in dRR Study-Status / Usage*
KIIIA1 4.1.1	Anonymous	2004	[redacted] specification packages (Spezifikation Verpackungs-mittel 30 L Kanister, blau ,UN-Zul/Div.Kunden, certificate of approval 3H1 plasic jerry can 30 L)	Y	MEN	1
KIIIA1 4.1.1	Roesler, A., Staaks-Fohl, A.	2009	Certificate of Approval - Mauser Werke - Specification of the design type 220 liter L-Ringfaß Plus/ L-drum plus	Y	MEN	1

* 1 accepted (study valid and considered for evaluation)
2 not accepted (study not valid and not considered for evaluation)
3 not considered (study not relevant for evaluation)
4 not submitted but necessary (study not submitted by applicant but necessary for evaluation)
5 supplemental (additional information, alone not sufficient to fulfil a data requirement, considered for evaluation)

Appendix 2: Critical Uses – Justification and GAP tables

GAP- table of intended uses for all cMS (without Germany) not verified by ZRMS

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance 1	**-**	**Conc. of as 1:**	**-**
active substance 2	**-**	**Conc. of as 2:**	**-**
active substance	**Benzoic acid**	**Conc. of as:**	**90 g/L**
safener	**no**	**Conc. of safener:**	**n.a.**
synergist	**no**	**Conc. of synergist:**	**n.a.**
Applicant:	**MENNO Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**Northern + Central + Southern/EU**	**non professional use**	☐

Verified by MS: no

1	2	3	4	5	6	7	8	10	11	12	13	14

Use-No.	Member state(s)	Crop and/ or situation (crop destination / purpose of crop)	F G or I	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	Application			Application rate			PHI (days)	Remarks: Disinfection concentration (time)
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product / ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
1	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Bacterial harmful organisms, Fungal harmful organisms	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
2	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Bacterial harmful organisms, Fungal harmful organisms	watering	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
3	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Bacterial harmful organisms, Fungal harmful organisms	flooding	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
4	EU	Rooms, buildings or	G,	Viruses and	Directed coarse	n.a.	a) 1	a) 80 - 320	a) 7200	a) 8000	not	1 %, 2 % or. 4 %,

		greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	I	viroids	spray or foaming (lathering)		b) not relevant		- 28800		relevant	max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
5	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Viruses and viroids	watering	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
6	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces		Viruses and viroids	flooding	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
7	EU	Rooms, buildings or greenhouses in agriculture and horticulture:	G, I	Bacterial harmful organisms, fungal harmful	Dipping	n.a.	a) 1 b) not relevant	not relevant	not relevant	not relevant	not relevant	4 % - 3 min. No direct treatment of

		Small tools (e.g. knifes, secateurs)		organisms, Viruses and Viroids								plants, soil or substrates. Only for disinfection.

n.a. = not applicable

Remarks: (1) Numeration of uses in accordance with the application/as verified by MS

(2) Member State(s) or zone for which use is applied for

(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)

(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)

(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages

(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench

Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated

(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application

(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided

(8) Min. interval between applications (days) were relevant

(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)

(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)

(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)

(13) PHI - minimum pre-harvest interval

(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.

GAP-Table of intended uses for Germany

GAP rev. (4), date: 2015-08-12

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance	**benzoic acid**	**Conc. of as :**	**90.00 g/L**

Applicant:	**Menno-Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):central EU		**non professional use**	☐

Verified by MS: yes

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**			**Application rate**			**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product/ha spray volume L/m², exposure time/ concentration	g as/ha g as/m²	Water L/ha min / max		
001	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the	after the last use or before each reuse and after thorough mechanical	1	80 or 160 L/ha spray volume:	7200 or 14400 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. *surfaces of standing

					plants	cleaning		0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	1%: 0.72 g as/m² 2%: 1.44 g as/m²			areas, vessels, walls, machinery and equipment etc. - for disinfection -
002	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *standing areas and vessels - for disinfection -
003	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 %	7200 or 14400 g as/ha 1%:			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								exposure time 4 hours: 2%	0.72 g as/m² 2%: 1.44 g as/m²			
004	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
005	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the	after the last use or before each reuse and after thorough	1	80 or 160 or 320 L/ha	7200 or 14400 or 28800 g			The exposure time is specific to the pathogen and can be reduced, if necessary.

					plants	mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			* standing areas and vessels - for disinfection -
006	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
007	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -
008	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

009	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
010	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
011	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment	after the last use or before each reuse and after thorough mechanical	1	80 or 160 or 320 L/ha	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing

					of the plants	cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			areas, vessels, walls, machinery and equipment etc. - for disinfection -
012	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								- harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
013	DE	vegetables NNNVV	G* I*	viruses BXXXXX** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%:			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								organisms difficult to inactivate: 4 %	2.88 g as/m²			
014	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -
015	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
016	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time	7200 or 14400 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								4 hours: 2%	2%: 1.44 g as/m²			
017	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
018	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
019	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%:			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								inactivate: 4 %	2.88 g as/m²			
020	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
021	DE	potato SOLTU (reproductive material)	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

022	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
023	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
024	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the	after the last use or before each reuse and after thorough mechanical	1	80 or 160 L/ha spray volume:	7200 or 14400 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non

					plants	cleaning		0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	1%: 0.72 g as/m² 2%: 1.44 g as/m²			profiled standing areas - for disinfection -
025	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								inactivate: 4 %				
026	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
027	DE	tobacco NIOTA	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								- harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			
028	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

** no EPPO-Code

Remarks:

(1) Numeration of uses in accordance with the application/as verified by MS

(2) Member State(s) or zone for which use is applied for

(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)

(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)

(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages

(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated

(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application

(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided

(8) Min. interval between applications (days) were relevant

(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)

(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)

(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)

(13) PHI - minimum pre-harvest interval

(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.

Appendix 3: Experimental testing of the products' physico-chemical and technical characteristics:

The following physical, chemical and technical properties of the plant protection product were experimentally tested:
Content of the active substance, colour, pH, surface tension, density, storage stability at high temperatures (14 d at 54 °C), low temperature stability (7 d at 0 °C), persistent foamingand dilution stability.
No significant deviations from the data submitted by the applicant were detected.
The formulation complies with the chemical, physical and technical criteria which are stated for this type of formulation in the FAO/WHO manual (2010).

REGISTRATION REPORT
Part B

Section 2: Analytical Methods
Detailed summary of the risk assessment

Product code: VP-LF/5 (Menno Florades)

Active Substance: Benzoic acid 90 g/L

Central Zone
Rapporteur Member State: Germany

CORE ASSESSMENT

Applicant: MENNO Chemie-Vertrieb GmbH

Submission Date: 19/12/2013

Date: 01/08/2017

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IIIA 5 METHODS OF ANALYSIS

This document summarises the information related to the analytical methods for the product VP-LF/5 (Menno Florades) containing the active substance benzoic acid which was approved according to Regulation (EC) No 1107/2009.

This product was the representative formulation. The product has not been previously evaluated according to Uniform Principles.

Appendix 1 of this document contains the list of references included in this document for support of the evaluation.

Information on the detailed composition of VP-LF/5 (Menno Florades) can be found in the confidential dossier of this submission (Registration Report - Part C).

IIIA 5.1 Analytical Standards and Samples

IIIA 5.1.1 Samples of the preparation

A sample of the preparation was provided by the applicant and analysis of the contents of the active substance benzoic acid was performed.

IIIA 5.1.2 Analytical standards for the pure active substance

An analytical standard of benzoic acid was provided by the applicant.

IIIA 5.1.3 Samples of the active substance as manufactured

Samples will be provided upon request.

IIIA 5.1.4 Analytical standards for relevant metabolites and all other components included in the residue definition

Samples will be provided upon request.

IIIA 5.1.5 Samples of reference substances for relevant impurities

Benzoic acid does not contain any impurity of toxicological or ecotoxicological concern.

IIIA 5.2 Methods for the Analysis of the Plant Protection Product

Analytical methods for the determination of benzoic acid and its impurities and relevance of CIPAC methods were evaluated as part in the EU review. The respective data are considered adequate and are not included in this submission. Additional studies to support the registration of VP-LF/5 (Menno Florades) not previously assessed are given below. All relevant data are provided and are considered adequate.

IIIA 5.2.1 Description of the analytical methods for the determination of the active substance in the plant protection product

The following analytical method for the determination of the active substances in the plant protection product performed on VP-LF/5 (Menno Florades) has not previously been reviewed.

Report:	Meinerling, M., Mollandin, G., 2008
Title:	Validation of an Analytical Method for the Determination of Benzoic Acid in Formulation
Document No:	43964101
Guidelines:	SANCO/3030/99 rev. 4
GLP	Yes

Method description
The analyte is determined by HPLC on a LaChrom, Merck Hitachi RP 18 column (250 x 4.0 mm, dp = 5 µm) at approximately 25 °C oven temperature. Injection volume is 10 µl. The separation is achieved using flow conditions for the detection and quantification of the actives at 0.7 ml/min. Detection is performed with a UV/DA detector with variable wavelength adjustment at 245 nm. The mobile phase consists of 50 % methanol and 50 % H_3PO_4 (0.3 M phosphoric acid). Retention time is at 8.5 min.
The analyte is quantified by comparing the specific response ratios of the samples with those of standards of known quality. A calibration with seven points is used.

Method validation
The validation data of method 43964101 were determined for the formulation VP-LF/5 (Menno Florades). It was with respect to precision, accuracy, linearity and specificity proved that the method is suitable for the determination of benzoic acid in the SL-formulation.

Table containing the methods and validation of the methods (formulation VP-LF/5 (Menno Florades**)**

Analyte	**Linearity n = 7**	**Accuracy n = 3 x 5 Mean [%]**	**Repeatability n = 3 x 5 [%RSD]**	**Specificity/Interferences**
Benzoic acid	10 to 250 mg analyte/ L r^2 = 0.9996	97 at 1 % level 98 at 5 % level 98 at 10% level	0.9 at 1 % level 0.8 at 5 % level 0.4 at 10% level	No interferences were noted. Chromatograms of formulation with and without active substances present were submitted.

Summary
The active substance of VP-LF/5 (Menno Florades) can be quantified using the analytical HPLC method 43964101. The method was developed for quantifying benzoic acid in VP-LF/5 (Menno Florades).
The active substance benzoic acid is dissolved in methanol / H_3PO_4, chromatographed on a HPLC system with UV-detection. The method can be used in soluble concentrates (SL).

IIIA 5.2.2 For preparations containing more than one active substance, description of method for determining each in the presence of the other

Please refer to chapter 5.2.1 as VP-LF/5 (Menno Florades) contains only one active substance.

IIIA 5.2.3 Applicability of existing CIPAC methods

There is no CIPAC method available for the determination of benzoic acid.

IIIA 5.2.4 Description of analytical methods for the determination of relevant impurities

Benzoic acid does not contain any impurity of toxicological or ecotoxicological concern.

IIIA 5.2.5 Description of analytical methods for the determination of formulants

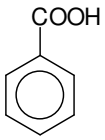
No formulants with toxicological or ecotoxicological relevant compounds are present in the formulation. Therefore, no analytical methods for the determination of formulants are necessary.

IIIA 5.3 Description of Analytical Methods for the Determination of Residues

IIIA 5.3.1 Evaluation of benzoic acid

The conclusions regarding the peer review of the analytical methods for residues of benzoic acid are summarized in EFSA Journal 2016;14(12): 4657.

Table 5.3-1: Information on the active substance benzoic acid

Name of component of residue definition **substance code** **IUPAC name** **formula**	**Structural formula**
Benzoic acid $C_7 H_6 O_2$	

IIIA 5.3.1.1 Overview of residue definitions and levels for which compliance is required

Benzoic acid is included in Annex IV of Regulation (EC) No. 839/2008. For commodities of plant and animal origin no MRLs were set.

Table 5.3-2: Relevant residue definitions

Matrix	**Relevant residue**	**Reference** **Remarks**
Plant material	Not defined	Regulation (EC) No 839/2008, annex IV
	Not required (no direct treatment of plants and plant products, use in protected areas)	Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Foodstuff of animal origin	Not defined	Regulation (EC) No 839/2008, annex IV
	Not required (no direct treatment of plants and plant products, use in protected areas)	Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Soil	Benzoic acid	Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Surface water	Benzoic acid	Conclusion on pesticide peer review,

Matrix	Relevant residue	Reference Remarks
		EFSA Journal 2016;14(12): 4657
Drinking/ground water	Benzoic acid	Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Air	Benzoic acid	Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Body fluids/tissue	Benzoic acid	Classified as STOT RE 1, Reg. 1272/2008

Benzoic acid is naturally present in soil. Also in water it shows a high background concentration. It is used as a food additive up to 150 mg/L.

Table 5.3-3: Levels for which compliance is required

Matrix	MRL	Reference for MRL/level Remarks
Plant, high water content	No MRL	Regulation (EC) No 839/2008, annex IV
Plant, acidic commodities		
Plant, dry commodities		
Plant, high oil content		
Plant, difficult matrices (hops, spices, tea)		
Meat		
Milk		
Eggs		
Fat		
Liver, kidney		
Soil	0.05 mg/kg	common limit
Drinking water	0.1 µg/L	General limit for drinking water
Surface water	> 120000 µg/L	LC_{50}/EC_{50} fish, aquatic invertebrates, Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Air	1500 µg/m^3	AOEL sys: 5 mg/kg bw/d, Conclusion on pesticide peer review, EFSA Journal 2016;14(12): 4657
Tissue (meat or liver)	Benzoic acid	Classified as STOT RE 1, Reg. 1272/2008
Body fluids	Benzoic acid	Classified as STOT RE 1, Reg. 1272/2008

IIIA 5.3.1.2 Description of Analytical Methods for the Determination of Residues of Benzoic acid in Plant Matrices (OECD KIII A 5.3.1)

Analytical methods for benzoic acid in food of plant origin are not required. No residue definition is established and no MRLs are set for benzoic acid which is included in annex IV of Regulation (EC) 396/2005. Furthermore, no direct treatment of plants is intended and no residues are expected in food and

feed of plant origin from these uses.

IIIA 5.3.1.3 Description of Analytical Methods for the Determination of Residues of Benzoic acid in Animal Matrices (OECD KIII A 5.3.1)

Analytical methods for benzoic acid in food of animal origin are not required. No residue definition is established and no MRLs are set for benzoic acid which is included in annex IV of Regulation (EC) 396/2005. Furthermore, no direct treatment of plants is intended and no residues are expected in feed of plant origin from these uses.

IIIA 5.3.1.4 Description of Methods for the Analysis of Benzoic acid in Soil (OECD KIII A 5.4)

Analytical methods for benzoic acid in soil are not required due to natural occurrence in soil and its low toxicity. It should however be noted, that as a result of peer review benzoic acid is defined as relevant residue in soil (see EFSA Journal 2016;14(12): 4657). According to the list of endpoints an analytical method is available (LC-MS/MS, LOQ: 0.05 mg/kg; confirmatory method: HPLC-DAD).

IIIA 5.3.1.5 Description of Methods for the Analysis of Benzoic acid in Water (OECD KIII A 5.6)

Analytical methods for benzoic acid in water are not required due to natural occurrence in surface water, its fast degradation (DT_{90}< 3d) and its low toxicity.
It should however be noted, that as a result of peer review benzoic acid is defined as relevant residue in drinking water, ground water and surface water (see EFSA Journal 2016;14(12): 4657). According to the list of endpoints an analytical method for drinking/ground water is available (LC-MS/MS, LOQ: 0.1 µg/L).

IIIA 5.3.1.6 Description of Methods for the Analysis of Benzoic acid in Air (OECD KIII A 5.7)

Analytical methods in air are not provided. According to the Guidance Document SANCO/825/00 rev. 8.1 analytical methods are not required for natural occurring substances. Benzoic acid is natural occurring but classified as STOT RE 1. Therefore, an analytical method should be provided.

IIIA 5.3.1.7 Description of Methods for the Analysis of Benzoic acid in Body Fluids and Tissues (OECD KIII A 5.8)

Analytical methods for body fluids and tissues are not provided. Methods for body fluids and tissues are required, because benzoic acid is classified according to GHS as follows: STOT (cat. 1).

IIIA 5.3.1.8 Other Studies/ Information

None

IIIA 5.4 Conclusion on the availability of analytical methods for the determination of residues

Residue analytical methods are not required for benzoic acid in food commodities of plant and animal.

The following data gaps, which should not prevent an authorisation of the product, were noticed:

- An analytical method for benzoic acid in air is missing.
- An analytical method for benzoic acid in body fluids and tissues is missing.

This application was submitted before publication of conclusions on the pesticides peer review (EFSA Journal 2016;14(12): 4657). As result of the peer review, residue definitions for soil, drinking/ground water, surface water, air and body fluids and tissues were set. Acceptable analytical methods for benzoic acid in soil, drinking/ground water and air were submitted.
In addition to the above mentioned data gaps, the following method was requested as a result of the peer review:
- An independent laboratory validation (ILV) of the method for benzoic acid in drinking water.

The identified data gaps in surface water are not considered here because the required LOQ for surface water are magnitudes higher than the drinking water limit. Because of the required high dilution of samples the influence of sample matrix is negligible. Therefore, surface water samples can be analyzed with the method validated for drinking water.

It is considered sufficient to fill the data gaps in the context of the next application for renewal of the active substance approval.

Appendix 1 – List of data submitted in support of the evaluation

Annex point/ reference No. OECD	Author(s)	Year	Title Source (where different from company) Report-No. GLP or GEP status (where relevant), Published or not	Data protection claimed	Owner	How considered in dRR Study-Status / Usage*
KIIIA1 5.2.1	Meinerling, M., Mollandin, G.	2008	Validation of an Analytical Method for the Determination of Benzoic Acid in Formulation, 43964101, GLP: yes, unpublished	Y	MEN	1

* 1 accepted (study valid and considered for evaluation)
2 not accepted (study not valid and not considered for evaluation)
3 not considered (study not relevant for evaluation)
4 not submitted but necessary (study not submitted by applicant but necessary for evaluation)
5 supplemental (additional information, alone not sufficient to fulfil a data requirement, considered for evaluation)

REGISTRATION REPORT
Part B

Section 3 Mammalian Toxicology
Detailed summary of the risk assessment

Product name: MENNO Florades
Active substance: Benzoic acid 90 g/L

All zones
Zonal Rapporteur Member State: DE

CORE ASSESSMENT

Applicant: Menno-Chemie-Vertrieb GmbH
Date: 01/08/2017

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3 Mammalian Toxicology (KCP 7)

3.1 Summary

Table 3.1-1: Information on MENNO Florades *

Product name and code	MENNO Florades (BVL code MEN-23900-BFV-1-SL)
Formulation type	Soluble concentrate (SL)
Active substance(s) (incl. content)	Benzoic acid (90 g/L)
Function	Bactericide/Fungicide/Viricide
Product already evaluated as the 'representative formulation' during the approval of the active substance(s)	Yes
Product previously evaluated in another MS according to Uniform Principles	No

* Information on the detailed composition of MENNO Florades can be found in the confidential dRR Part C.

Justified proposals for classification and labelling

According to the criteria given in Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008, the following classification and labelling with regard to toxicological data is proposed for the preparation:

Table 3.1-2: Justified proposals for classification and labelling for MENNO Florades according to Regulation (EC) No 1272/2008

Hazard class(es), categories	Eye Dam. 1, STOT SE 2, STOT RE 2
Hazard pictograms or Code(s) for hazard pictogram(s)	GHS05, GHS07, GHS08
Signal word	Danger
Hazard statement(s)	318-336-373
Precautionary statement(s)	101-102-260-271-280-305+351+338-308+310-403+233-405-501
Additional labelling phrases	To avoid risks to human health and the environment, comply with the instructions for use. [EUH401]
Product identifier (hazardous components which must be listed on the label)	Benzoic acid (CAS No. 65-85-0), propan-1-ol (CAS No. 71-23-8), propan-2-ol (CAS No. 67-63-0), formic acid (CAS No. 64-18-6)

Table 3.1-3: Summary of risk assessment for operators, workers, residents and bystanders for MENNO Florades

	Result	PPE / Risk mitigation measures
Operators	Acceptable	- Avoid any unnecessary contact with the product. Misuse can lead to health damage. [SB001] - The directive concerning requirements for personal protective gear in plant protection, "Personal protective gear for handling plant protection products" of the Federal Office of Consumer Protection and Food Safety must be observed. [SB110] - Do not eat, drink or smoke when using this product. [SB166] - Wear tight fitting eye protection when handling the undiluted product. [SE110] - Wear standard protective gloves (plant protection) when handling the

	Result	PPE / Risk mitigation measures
		undiluted product. [SS110] - Wear standard protective gloves (plant protection) when handling/applying the product ready for application. [SS120] - Wear a protective suit against pesticides and sturdy shoes (e.g. rubber boots) when handling the undiluted product. [SS2101] - Wear a rubber apron when handling the undiluted product. [SS610] - Wear work clothing and sturdy footwear (e.g. rubber boots) during handling and applying plant protection products, if no specific protective clothing is required. [SS206] - Wear half mask with combination filter A1-P2 (identification colour: brown/white) according to the BVL guideline "Personal protective equipment for handling plant protection products", current version, when handling the undiluted product. [ST2102]
Workers	Acceptable	- Contact with treated surfaces / equipment has to be avoided until coating has dried. [SFneu]
Residents	Acceptable	None
Bystanders	Acceptable	None

No unacceptable risk for operators, workers, residents and bystanders was identified when the product is used as intended and provided that the PPE/ risk mitigation measures stated in Table 3.1-3 are applied.

A summary of the critical uses and the overall conclusion regarding exposure for operators, workers and residents / bystanders is presented in the following table.

Table 3.1-4 Critical uses and overall conclusion of exposure assessment

1	2	3	4	5	6	7	8	9	10			
Use-No.*	**Crops and situation (e.g. growth stage of crop)**	**F, Fn, Fpn G, Gn, Gpn, I, In, Ipn****	**Application**		**Application rate**		**PHI (d)**	**Remarks: (e.g. safener/synergist (L/ha)) critical gap for operator, worker, bystander or resident exposure based on [Exposure model]**	**Acceptability of exposure assessment**			
			Method / Kind (incl. application technique ***	**Max. number (min. interval between applications) a) per use b) per crop/ season**	**Max. application rate kg as/ha**	**Water L/ha min / max**			**Operator**	**Worker**	**Residents**	**Bystander**
4	Surfaces	G, I	Spraying or foaming	a) 1 b) 1	28.8	8000	n.r.	max. 4 % solution, max. 16 h				
5	Hard surfaces, container	G, I	Watering	a) 1 b) 1	28.8	8000	n.r.	max. 4 % solution, max. 16 h				
6	Sealed, plain, non-profiled surfaces	G, I	Flooding	a) 1 b) 1	28.8	8000	n.r.	max. 4 % solution, max. 16 h				
7	Small tools	G, I	Dipping	a) 1 b) 1	-	-	n.r.	4% solution, 3 min				

* Number(s) in accordance with the list of all intended GAPs

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application, In: non-professional indoor use; Ipn: professional and non-professional indoor use

*** e.g. LC: low crops, HC: high crop, TM: tractor-mounted, HH: hand-held

Explanation for column 10 “Acceptability of exposure assessment”

A	Exposure acceptable without PPE / risk mitigation measures
R	Further refinement and/or risk mitigation measures required
N	Exposure not acceptable/ Evaluation not possible

Data gaps

No data gaps are noticed.

3.2 Toxicological Information on active substance(s)

The active substance was evaluated under directive No 94/414/EEC (as amended) or regulation (EC) No 1107/2009 (as amended). Information regarding classification of the active substances and on EU endpoints identified during the EU review is given in the following table(s). Further information on active substances is included in the reports on the results of the peer review process and in the respective background documents.

Table 3.2-1: Information on benzoic acid

Classification and labelling	
With regard to toxicological endpoints (according to the criteria in Regulation (EC) No 1272/2008, as amended)	Regulation (EC) No 1272/2008 (as amended): Warning, Skin Irr. 2, H315: Causes skin irritation Danger, Eye Dam. 1, H318: Causes serious eye damage Danger, STOT RE 1, H372: Causes damage to organs through prolonged or repeated exposure (lungs; inhalation)
Proposals for additional classification and labelling	n.n.
Agreed EU endpoints	
AOEL systemic	5 mg/kg bw/d (correction for limited oral absorption: n.n.)
Reference	SANCO/1396/2001-Final (2003-11-28)

3.3 Toxicological Evaluation of Plant Protection Product

A summary of the toxicological evaluation for MENNO Florades is given in the following tables. The product was the representative formulation for the approval of benzoic acid in the EU. The studies were already described in the monograph on benzoic acid and are not reported in detail again.

Table 3.3-1: Summary of evaluation of the studies on acute toxicity including irritancy and skin sensitisation for MENNO Florades

Type of test, species, model system (Guideline)	**Result**	**Acceptability**	**Classification (acc. to the criteria in Reg. 1272/2008)**	**Reference**
Acute oral, rat (OECD 401)	> 2000 mg/kg bw	Yes	None	[redacted]; 1994a TOX9652184
Acute dermal, rat (OECD 402)	> 2000 mg/kg bw	Yes	None	[redacted]; 1994b TOX9652185
Acute inhalation	Not submitted. ATE > 5 mg/L air *		None	-
Skin irritation, rabbit (OECD 404)	Not irritant	Yes	None	[redacted]; 1994c TOX9652186
Eye irritation, rabbit (OECD 405)	Irritant	Yes	Eye Dam. 1, H318	[redacted]; 1994d TOX9652187

Skin sensitisation, Guinea pig (OECD 406; M&K test)	Not sensitising	Yes	None	[redacted]; 2003 TOX2003-1016

* besides the active substance no other component in MENNO Florades is classified for inhalation toxicity, the LC_{50} of benzoic acid is 1.2 mg/L air, but with respect to the low concentration of the active substance in the product no classification results using the calculation method

Table 3.3-2: Additional toxicological information relevant for classification/labelling of MENNO Florades

	Substance (Concentration in product, % w/w)	Classification of the substance (acc. to the criteria in Reg. 1272/2008)	Reference	Classification of product (acc. to the criteria in Reg. 1272/2008)
Toxicological properties of active substance(s) (relevant for classification of product)	Benzoic acid (9.0 % (w/w))	STOT RE 1; H372 (≥ 10 %) STOT RE 2; H373 (≥ 1 %; < 10 %)	Reg. 1272/2008	STOT RE 2; H373 (lungs) (inhalation)
Toxicological properties of non-active substance(s) (relevant for classification of product)	Ethylene glycol (CAS No. 107-21-1, 15-[redacted] Propan-1-ol (CAS No. 71-[redacted] and propan-2-ol (CAS No. 67-[redacted]	STOT RE 2; H373 [redacted] STOT SE 3; H336 [redacted]	Registration dossier ** Reg. 1272/2008	STOT RE 2; H373 (kidney) (oral) STOT SE 3; H336
Further toxicological information	No data – not required			

* concentration range or concentration limit as provided in MSDS
** based on registration dossier for ethylene glycol available on ECHA website

3.4 Toxicological Evaluation of Groundwater Metabolites

Not necessary since no metabolite predicted > 0.1 µg/l in groundwater.

3.5 Dermal Absorption (KCP 7.3)

A summary of the dermal absorption rates used in the exposure assessment of the present application are presented in the following table.
During the EU renewal evaluation of benzoic acid a default dermal absorption value of 100% for the concentrate and the dilution was proposed by the RMS. No explanation was given why the default values from the EFSA guidance do not apply. Therefore, 25 % for the concentrate and 75 % for the dilution are applied for this assessment.

Table 3.5-1: Dermal absorption rates for active substances in MENNO Florades

	Benzoic acid	
	Value	**Reference**
Concentrate	25 %	EFSA Journal 2012;10(4):2665

	Benzoic acid	
	Value	**Reference**
Dilution	75 %	

3.5.1 Justification for proposed values

No data on dermal absorption for benzoic acid in MENNO Florades are available. Justifications for default values according to Guidance on Dermal Absorption (EFSA Journal 2012; 10(4):2665) are presented in the following table.

Table 3.5-2: Default dermal absorption rates for benzoic acid

	Value	Justification for value	Acceptability of justification
Concentrate	25 %	> 5 %	-
Dilution	75 %	≤ 5 %	-

3.6 Exposure Assessment of Plant Protection Product (KCP 7.2)

Table 3.6-1: Product information and toxicological reference values used for exposure assessment

Product name and code	MENNO Florades
Formulation type	SL
Category	Bactericide/Fungicide/Viricide
Container size(s), short description	1 L, 2 L, 10 L, 20 L, 30 L and 220 L HDPE container with 20 mm, 43.5 mm, 49.6 mm, 59 mm, 59.5 mm inner and 2 inch outer diameter opening
Active substance (incl. content)	**Benzoic acid (90** g/L)
AOEL systemic	5 mg/kg bw/d
Inhalation absorption	100 %
Oral absorption	100 %
Dermal absorption	Concentrate: 25 % Dilution: 75 % Default

3.6.1 Selection of critical use(s) and justification

The critical GAP(s) used for the exposure assessment of the plant protection product are shown in Table 3.1-4.

3.6.2 Operator exposure (KCP 7.2.1)

3.6.2.1 Estimation of operator exposure

An exposure assessment for the intended uses of MENNO Florades was already presented during the renewal evaluation of benzoic acid at EU level. Nevertheless, calculations will be presented again for default dermal absorption values acc. to EFSA guidance.
The exposure models used for estimation of operator exposure to the active substances during application of MENNO Florades according to the critical uses are presented in Table 3.6-2.

Table 3.6-2: Exposure models for intended uses

Critical use(s)	Spraying or foaming of surfaces (max. 4 % solution)
Model(s)	Spraying Model 1, p. 281, Biocides Human Health Exposure Methodology, October 2015
Critical use(s)	Watering or flooding of surfaces (max. 4 % solution)
Model(s)	Watering-can, p. 68, Human Exposure to Biocidal Products, Technical Notes for Guidance, June 2007
Critical use(s)	Dipping of small tools (max. 4 % solution, 3 min)
Model(s)	Dipping Model 1 and 4, p. 308 and p. 311, Biocides Human Health Exposure Methodology, October 2015

Spraying or foaming of surfaces (TNsG Spraying Model 1)

Exposure values (75th percentiles)

Potential dermal exposure (body): 92 mg/min
Hand exposure inside gloves: 10.7 mg/min
Deposits on protective gloves (max.): 181 mg/min
Inhalation exposure: 130 mg/m^3

Parameters

Benzoic acid content of MENNO Florades: 90 g/L
Spray dilution: 25-fold (4 %)
Ratio of benzoic acid in dilution 0.0036
Working duration: 8 h
Inhaled air: 1.25 m^3/h
Dermal absorption: 75 %
Inhalation absorption: 100 %
Body weight: 60 kg

Calculation

The model includes exposure from mixing/loading and from application. As a worst case 75 % dermal absorption is used as a conservative approach for total exposure from all tasks. Exposure is expressed in mg diluted product per min or m^3.

Body (potential): 92 mg/min x 480 min x 0.0036 x 0.75 = 119.23 mg a.s.
Hands (inside gloves): 10.7 mg/min x 480 min x 0.0036 x 0.75 = 13.87 mg a.s.
Gloves outside: 181 mg/min x 480 x 0.0036 x 0.75 = 234.58 mg a.s.
Inhalation: 130 mg/m^3 x 1.25 m^3/h x 8 h x 0.0036 x 1 = 4.68 mg a.s.

Without gloves

Total:	(119.23 mg + 234.58 mg + 4.68 mg) / 60 kg = 5.97 mg a.s./kg bw/day
% AOEL	5.97 mg/kg bw/day / 5 mg/kg bw/day x 100 % = 119.5 %

With gloves

Total:	(119.23 mg + 13.87 mg + 4.68 mg) / 60 kg = 2.30 mg a.s./kg bw/day
% AOEL	2.30 mg/kg bw/day / 5 mg/kg bw/day x 100 % = 45.9 %

Conclusion

Operator exposure for spraying (or foaming) surfaces with protective gloves is acceptable.

Watering and flooding (TNsG Watering-can)

This scenario is considered to be covered by spraying of surfaces. Nevertheless, exposure was calculated with the TNsG model for treating soil with a watering can.

Exposure values

Potential dermal exposure (body):	48.8 mg/min
Hand exposure inside gloves:	38.2 mg/min
Inhalation exposure:	4.15 mg/m^3

Parameters

Benzoic acid content of MENNO Florades:	90 g/L
Spray dilution:	25-fold (4 %)
Ratio of benzoic acid in dilution	0.0036
Working duration:	8 h
Inhaled air:	1.25 m^3/h
Dermal absorption:	75 %
Inhalation absorption:	100 %
Body weight:	60 kg

Calculation

The tasks covered by the data include mixing and loading. As a worst case 75 % dermal absorption is used as a conservative approach for total exposure from all tasks. Exposure is expressed in mg diluted product per min or m^3.

Body (work wear):	48.8 mg/min x 480 min x 0.0036 x 0.75 = 63.24 mg a.s.
Hands (inside gloves):	38.2 mg/min x 480 min x 0.0036 x 0.75 = 49.51 mg a.s.
Inhalation:	4.15 mg/m^3 x 1.25 m^3/h x 8 h x 0.0036 x 1 = 0.15 mg a.s.
Total:	(63.24 mg + 49.51 mg + 0.15 mg) / 60 kg = 1.88 mg a.s./kg bw/day
% AOEL	1.88 mg/kg bw/day / 5 mg/kg bw/day x 100 % = 37.6 %

Conclusion

Operator exposure for watering surfaces with protective gloves is acceptable.
No data for hand exposure without gloves are available in this model. As a worst case a protection of 1 % by wearing gloves is assumed. Thus, for hand exposure without gloves a theoretical value of 3820 mg/min is used in the calculation. Total exposure without gloves will exceed the AOEL (1671 % of the AOEL). Therefore, wearing gloves is required.

Dipping of small tools (TNsG Dipping Model 1 and 4)

Exposure values (max. values)

Potential dermal exposure (body):	178 mg/min
Hand exposure inside gloves:	25.7 mg/min
Feet exposure inside shoes:	25.8 mg/min
Inhalation exposure (75th perc.):	0.11 mg/m^3

Parameters

Benzoic acid content of MENNO Florades:	90 g/L
Spray dilution:	25-fold (4 %)
Ratio of benzoic acid in dilution	0.0036
Working duration:	8 h
Inhaled air:	1.25 m^3/h
Dermal absorption:	75 %
Inhalation absorption:	100 %
Body weight:	60 kg

Calculation

The exposure data from the dipping model (expressed in mg diluted product) do not include the mixing/loading task. However, with respect to the very conservative assumption that the operator disinfects tools for 8 h it can be assumed that exposure from the mixing/loading task is also covered.

Body (work wear):	178 mg/min x 480 min x 0.0036 x 0.75 x 0.1 = 230.69 mg a.s.
Hands (inside gloves):	25.7 mg/min x 480 min x 0.0036 x 0.75 = 33.31 mg a.s.
Feet (inside shoes):	25.8 mg/min x 480 min x 0.0036 x 0.75 = 33.44 mg a.s.
Inhalation:	0.11 mg/m^3 x 1.25 m^3/h x 8 h x 0.0036 x 1 = 0.004 mg a.s.
Total:	(230.69 mg + 33.31 mg + 33.44 mg + 0.004 mg) / 60 kg = 4.96 mg a.s./kg bw/day
% AOEL	4.96 mg/kg bw/day / 5 mg/kg bw/day x 100 % = 99.15 %

Conclusion

Operator exposure for dipping of small tools with protective gloves is acceptable.
No data for hand exposure without gloves are available in this model. As a worst case a protection of 1% by wearing gloves is assumed which is translated into a theoretical value of 2570 mg/min for hand exposure without gloves. The corresponding total exposure without gloves will exceed the AOEL (1198 % of the AOEL).

3.6.2.2 Measurement of operator exposure

Since the operator exposure estimations carried out indicated that the acceptable operator exposure level (AOEL) will not be exceeded under conditions of intended uses and considering above mentioned personal protective equipment (PPE), a study to provide measurements of operator exposure was not necessary and was therefore not performed.

3.6.3 Worker exposure (KCP 7.2.3)

3.6.3.1 Estimation of worker exposure

The critical use for the worker is handling equipment treated with MENNO Florades. No appropriate model exists for this scenario. In the RAR on benzoic acid a default hand exposure value of 210 mg product for 15 min of contact (based on the 90th percentile of RISKOFDERM data determined for the cleaning of spray guns) was proposed according to Marquart et al. (2006). Exposure was extrapolated to a whole working day of 8 h and found to be acceptable without PPE.
The approach chosen for this evaluation is based on a transfer coefficient of dried residues of up to 18 % for various types of surfaces (Biocides Human Health Exposure Methodology, p. 171, October 2015).

Parameters

Transfer coefficient for surfaces:	18 %
Application rate:	28.8 kg /ha (0.288 mg/cm^2)
Exposed surface (hand + forearm):	820 cm^2 + 1128.8 cm^2
Dermal absorption:	75 %
Body weight:	60 kg

Calculation

Potential hands/forearms:	1948.8 cm^2 x 0.288 mg/cm^2 x 0.18 x 0.75 = 75.77 mg a.s.
Total:	75.77 mg / 60 kg = 1.26 mg a.s./kg bw/day
% AOEL	1.26 mg/kg bw/day / 5 mg/kg bw/day x 100 % = 25.3 %

Conclusion

Worker exposure for handling treated equipment is acceptable. However, treated equipment should not be handled before the benzoic acid solution has dried.

3.6.3.2 Measurement of worker exposure

Since the worker exposure estimations carried out indicated that the acceptable operator exposure level (AOEL) will not be exceeded under conditions of intended uses and considering above mention PPE, a study to provide measurements of worker exposure was not necessary and was therefore not performed.

3.6.4 Resident and bystander exposure (KCP 7.2.2)

3.6.4.1 Estimation of resident and bystander exposure

No bystander and resident exposure is expected since the product is applied in greenhouses or storage rooms.

3.6.4.2 Measurement of resident and/or bystander exposure

No bystander or resident exposure is expected.

3.6.5 Combined exposure

Not relevant. The product contains only one active substance.

Appendix 1 Reference list

Annex point/ reference No	Author(s)	Year	Title Report-No. Authority registration No.	Data protection claimed	Owner	How considered in dRR *
KCP 7.1.5	[redacted]	1994a	Acute eye irritation / corrosion test of "Menno Florades" in rabbits 10-03-0861/00-94 GLP: Open (1) Yes (7) Published: No BVL-2764819, TOX9652187	Y	MEN	Y
KCP 7.1.4	[redacted]	1994b	Acute dermal irritation / corrosion test of "Menno Florades" in rabbits 10-03-0862/00-94 GLP: Open (1) Yes (7) Published: No BVL-2764817, TOX9652186	Y	MEN	Y
KCP 7.1.1	[redacted]	1994c	Acute oral toxicity test of "Menno Florades" in rats 10-04-0859/00-94 GLP: Open (1) Yes (7) Published: No BVL-2764815, TOX9652184	Y	MEN	Y
KCP 7.1.2	[redacted]	1994d	Acute dermal toxicity test of "Menno Florades" in rats 10-04-0860/00-94 GLP: Open (1) Yes (7) Published: No BVL-2764816, TOX9652185	Y	MEN	Y
KCP 7.1.6	[redacted]	2003	Maximisation sensitisation test according to magnusson u. kligman of " VP-FL/5" (commercial name: Menno Florades) in the guinea pig 10-5-0202-02 GLP: Yes Published: No (5) Open (3) BVL-2764820, TOX2003-1016	Y	MEN	Y

*Y, Yes/relied on; N, No/not relied on; Add, Additional, Relied on/study not submitted by applicant but necessary for evaluation

REGISTRATION REPORT
Part B

Section 4 Metabolism and Residues

Detailed summary of the risk assessment

Product name: MENNO Florades

Active substance: Benzoic acid 90 g/L

All Zones
Zonal Rapporteur Member State: Germany

CORE ASSESSMENT

Applicant: Menno-Chemie-Vertrieb GmbH

Date: 01/08/2017

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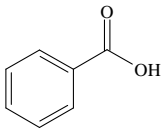
4 METABOLISM AND RESIDUES DATA

4.1 Evaluation of the active substance

4.1.1 Benzoic acid

Table 4.1-1: Identity of the active substance

Structural formula	
Common Name	Benzoic acid
CAS number	65-85-0

4.1.1.1 Storage stability

Storage stability data on benzoic acid are not available and not required. This has already been stated on EU level in the DAR (ASB2010-10528) and in EFSA's RO regarding the first establishment of Annex IV of Regulation (EC) 396/2005 (ASB2012-3636).

Table 4.1-2: Stability of residues (Annex IIA, point 6.1)

Stability of benzoic acid	No data available and none required Due to the application fields of benzoic acid (disinfection) and since neither plants nor soil will be treated no residues will occur in plants. No studies are therefore necessary.

4.1.1.2 Metabolism in plants and plant residue definition(s)

Data on the metabolism of benzoic acid in plants are not available and not required. This has already been established on the EU level in the DAR (ASB2010-10528) and in EFSA's RO regarding the first establishment of Annex IV of Regulation (EC) 396/2005 (ASB2012-3636).

Table 4.1-3: Metabolism in plants (Annex IIA, point 6.2.1; 6.5.1, 6.5.2, 6.6.2 and 6.7.1)

Plant groups covered	No data available and none required Application fields for benzoic acid are disinfection of deposit areas (fleece mats, ebb/flood benches), culture vessels, knives, and gardening equipment by directed coarse spraying, pouring of foam or aqueous solution, dipping or watering without air assistant pressure. Neither plants nor soil will be treated with the compound. Furthermore, benzoic acid is a natural substance in plants and is used extensively as additive in food and feeding stuff. Consequently, no studies on distribution and expression of residues in plants are necessary.
Rotational crops	No metabolism studies in representative succeeding crops are necessary since benzoic acid is applied neither to soil nor to plants and the application takes place in protected areas only (indoor/ glasshouse).

Metabolism in rotational crops similar to metabolism in primary crops? (yes/no)	Not applicable
Distribution of the residue in peel/ pulp	Not applicable
Processed commodities (nature of residue)	No processing studies are necessary since applications with benzoic acid (neither to soil nor to plants) will not result in residues in plants.
Residue pattern in raw and processed commodities similar? (yes/no)	Not applicable
Plant residue definition for monitoring	Not necessary. Benzoic acid is listed in Annex IV of Reg. (EC) No 396/2005.
Plant residue definition for risk assessment	Not necessary according to DAR (ASB2010-10528) and EFSA RO (ASB2012-3636)
Conversion factor(s) (monitoring to risk assessment)	Not applicable

4.1.1.3 Metabolism in livestock and animal residue definition(s)

Data on the metabolism of benzoic acid in livestock are not available and not required. This has already been stated on EU level in the DAR (ASB2010-10528) and in EFSA's RO regarding the first establishment of Annex IV of Regulation (EC) 396/2005 (ASB2012-3636).

Table 4.1-4: Metabolism in livestock (Annex IIA, point 6.2.2 to 6.2.5 and 6.7.1)

Animals covered	No data available and none required Since neither plants nor soil will be treated with benzoic acid the active substance benzoic acid will not come into contact with feeding stuff. No studies on metabolism, distribution and expression of residues in livestock are therefore necessary.
Time needed to reach a plateau concentration in milk and eggs	Not applicable
Animal residue definition for monitoring	Not necessary. Benzoic acid is listed in Annex IV of Reg. (EC) No 396/2005.
Animal residue definition for risk assessment	Not necessary according to DAR (ASB2010-10528) and EFSA RO (ASB2012-3636)
Conversion factor(s) (monitoring to risk assessment)	Not applicable
Metabolism in rat and ruminant similar (yes/no)	Not applicable
Fat soluble residue: (yes/no)	no (log P_{ow} = 1.87)

4.1.1.4 Residues in rotational crops

Field rotational crop studies on benzoic acid are not available and not required. This has already been stated on EU level in the DAR (ASB2010-10528) and in EFSA's RO regarding the first establishment of Annex IV of Regulation (EC) 396/2005 (ASB2012-3636).

Table 4.1-5: Residues in rotational crops (Annex IIA, point 6.6.3)

Field studies	No field rotational crop studies are necessary since benzoic acid is applied neither to soil nor to plants and the application takes place in protected areas only (indoor/ glasshouse).

4.1.1.5 Residues in livestock

Neither plants nor soil will be treated with benzoic acid. No residues will occur in plants. Thus, no calculation of the dietary burden was performed and no feeding studies are necessary.

Table 4.1-6: Conditions of requirement of livestock feeding studies (Annex IIA, point 6.4)

	Ruminant:	**Poultry:**	**Pig:**
Expected intakes by livestock ≥0.1 mg/kg diet (dry weight basis) (yes/no – If yes, specify the level)	No	No	No
Potential for accumulation (yes/no):	No	No	No
Metabolism studies indicate potential level of residues ≥0.01 mg/kg in edible tissues (yes/no)	Not applicable	Not applicable	Not applicable

Table 4.1-7: Results of livestock feeding studies (Annex IIA, point 6.4)

	Ruminant:	**Poultry:**	**Pig:**
Feeding studies	Not necessary	Not necessary	Not necessary
Feeding levels in mg/kg feed DM	Not applicable	Not applicable	Not applicable
Feeding levels in mg/kg bw	Not applicable	Not applicable	Not applicable
Relevant dosing levels in feeding study:	Not applicable	Not applicable	Not applicable
	Expected residue levels in animal matrices at calculated dietary burden (mg/kg):		
Muscle	<0.01	<0.01	<0.01
Liver	<0.01	<0.01	<0.01
Kidney	<0.01	–	<0.01
Fat	<0.01	<0.01	<0.01
Milk	<0.01	–	–
Eggs	–	<0.01	–

4.2 Evaluation of the intended uses

4.2.1 Selection of critical use and justification

The GAP reported for the central zone is presented in the following table. Since there is no direct treatment on plants or plant products, and the product is a disinfectant on surfaces and tools, the GAP has been structured according to the pests and not according to the crop (Table 4.2-2). For Germany, cultures have to be listed separately, therefore the GAP is extended compared to the "EU-GAP", although the same uses are intended (Table 4.2-1). The listed GAPs have been used for consumer intake and risk assessment.

Table 4.2-1: Critical Uses – GAP tables for Germany (sorted by crops)

1	2	3	4	5	6	7	8	9	10	11	12	13
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)** **(a)**	**F G or I** **(b)**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)** **(c)**	**Application**			**Application rate**			**PHI (days) (i)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures** **(j)**
					Method / Kind **(d-f)**	**Timing / Growth stage of crop & season** **(g)**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season** **(h)**	**L product / ha** **Spray volume** **L/m²** **exposure time/ concentration**	**g as/ha** **g as/m²**	**Water L/ha** **min / max**		
001 - 003	DE	Ornamentals surfaces of standing areas, vessels, walls, machinery and equipment etc.; sealed, plane, non profiled standing areas (for disinfection)	G, I	Bacterial and fungal harmful organisms	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m²			The exposure time is specific to the pathogen and can be reduced, if necessary.
004 - 006	DE	Ornamentals surfaces of standing areas, vessels, walls, machinery and equipment etc.; sealed, plane, non profiled standing areas (for disinfection)	G, I	Viruses, viroids	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m² 4%: 2.88 g as/ m²			The exposure time is specific to the pathogen and can be reduced, if necessary.
007	DE	Ornamentals cutting tools (for disinfection)	G, I	Bacterial and fungal harmful organisms, viruses, viroids	dipping no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	exposure time 3 minutes: 4 %	Not applicable			

1	2	3	4	5	6	7	8	9	10	11	12	13
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)** **(a)**	**F G or I** **(b)**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)** **(c)**	**Application**			**Application rate**			**PHI (days) (i)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures** **(j)**
					Method / Kind **(d-f)**	**Timing / Growth stage of crop & season** **(g)**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season** **(h)**	**L product / ha** **Spray volume** **L/m²** **exposure time/ concentration**	**g as/ha** **g as/m²**	**Water L/ha** **min / max**		
008 - 010	DE	Vegetables surfaces of standing areas, vessels, walls, machinery and equipment etc. , sealed, plane, non profiled standing areas (for disinfection)	G, I	Bacterial and fungal harmful organisms	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m²			The exposure time is specific to the pathogen and can be reduced, if necessary.
011 - 013	DE	Vegetables surfaces of standing areas, vessels, walls, machinery and equipment etc., sealed, plane, non profiled standing areas (for disinfection)	G, I	Viruses, Viroids	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m² 4%: 2.88 g as/ m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary.
014	DE	Vegetables cutting tools (for disinfection)	G, I	Bacterial and fungal harmful organisms, viruses, viroids	dipping, no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	exposure time 3 minutes: 4 %	Not applicable		N	
015 - 017	DE	Potatoes surfaces of standing areas, vessels, walls, machinery and equipment etc., sealed, plane, non profiled standing areas (for disinfection)	G, I	Bacterial and fungal harmful organisms	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary.

1	2	3	4	5	6	7	8	9	10	11	12	13
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)** **(a)**	**F G or I** **(b)**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)** **(c)**	**Application**			**Application rate**			**PHI (days) (i)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures** **(j)**
					Method / Kind **(d-f)**	**Timing / Growth stage of crop & season** **(g)**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season** **(h)**	**L product / ha** **Spray volume** **L/m²** **exposure time/ concentration**	**g as/ha** **g as/m²**	**Water L/ha** **min / max**		
018 - 020	DE	Potatoes surfaces of standing areas, vessels, walls, machinery and equipment etc., sealed, plane, non profiled standing areas (for disinfection)	G, I	Viruses, viroids	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m² 4%: 2.88 g as/ m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary.
021	DE	Potatoes cutting tools (for disinfection)	G, I	Bacterial and fungal harmful organisms, viruses, viroids	dipping, no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	exposure time 3 minutes: 4 %	Not applicable		N	
022 - 024	DE	Tobacco surfaces of standing areas, vessels, walls, machinery and equipment etc., sealed, plane, non profiled standing areas (for disinfection)	G, I	Bacterial and fungal harmful organisms	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary.
025 - 027	DE	Tobacco surfaces of standing areas, vessels, walls, machinery and equipment etc., sealed, plane, non profiled standing areas	G, I	Viruses, Viroids	spraying or foaming, watering, flooding no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/ m²		N	The exposure time is specific to the pathogen and can be reduced, if necessary.

1	2	3	4	5	6	7	8	9	10	11	12	13
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)** **(a)**	**F G or I** **(b)**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)** **(c)**	**Application**			**Application rate**			**PHI (days) (i)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures** **(j)**
					Method / Kind **(d-f)**	**Timing / Growth stage of crop & season** **(g)**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season** **(h)**	**L product / ha** **Spray volume** **L/m²** **exposure time/ concentration**	**g as/ha** **g as/m²**	**Water L/ha** **min / max**		
		(for disinfection)						to inactivate: 4 %	4%: 2.88 g as/ m²			
028	DE	Tobacco cutting tools (for disinfection)	G, I	Bacterial and fungal harmful organisms	dipping, no direct treatment of the plants	after the last use or before each re-use and after thorough mechanical cleaning	a) 1	exposure time 3 minutes: 4 %	Not applicable		N	

Remarks:
(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
(d) All abbreviations used must be explained
(e) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
(f) Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(g) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(h) The minimum and maximum number of application possible under practical conditions of use must be provided
(i) PHI - minimum pre-harvest interval
(j) Remarks may include: Extent of use/economic importance/restrictions

Table 4.2-2: Critical Uses – GAP tables for other EU Member States than Germany (sorted by pests)

1	2	3	4	5	6	7	8	9	10	11	12	13
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)** **(a)**	**F G or I** **(b)**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)** **(c)**	**Application**			**Application rate**			**PHI (days) (i)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures** **(j)**
					Method / Kind **(d-f)**	**Timing / Growth stage of crop & season** **(g)**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season** **(h)**	**L product / m²** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/m²** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
1 - 3	EU	Rooms, buildings or greenhouses in agriculture and horticulture: – Surfaces of tables, benches, trays, walls, machines, container and vessels – Hard surfaces and Container – Sealed, plain, and nonprofiled hard surfaces	G, I	Bacterial and fungal harmful organisms	– Directed coarse spray or foaming (lathering) – watering – flooding	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	N	Disinfection concentration (time) 1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
4 - 6	EU	Rooms, buildings or greenhouses in agriculture and horticulture: – Surfaces of tables, benches, trays, walls, machines, container and vessels – Hard surfaces and Container – Sealed, plain, and nonprofiled hard surfaces	G, I	Viruses and viroids	– Directed coarse spray or foaming (lathering) – watering – flooding	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	N	Disinfection concentration (time) 1%, 2% or 4%, max. 16h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.

1	2	3	4	5	6	7	8	9	10	11	12	13
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)** **(a)**	**F G or I** **(b)**	**Pests or Group of pests controlled** **(additionally: developmental stages of the pest or pest group)** **(c)**	**Application**			**Application rate**			**PHI (days) (i)**	**Remarks:** **e.g. safener/synergist per ha** **e.g. recommended or mandatory tank mixtures** **(j)**
					Method / Kind **(d-f)**	**Timing / Growth stage of crop & season** **(g)**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season** **(h)**	**L product / m²** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/m²** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
7	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Bacterial and fungal harmful organisms, Viruses and viroids	– Dipping	n.a.	a) 1 b) not relevant	not relevant	not relevant	not relevant	N	Disinfection concentration (time) 4% - 3 min. No direct treatment of plants, soil or substrates. Only for disinfection.

Remarks:
(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
(d) All abbreviations used must be explained
(e) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
(f) Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(g) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(h) The minimum and maximum number of application possible under practical conditions of use must be provided
(i) PHI - minimum pre-harvest interval
(j) Remarks may include: Extent of use/economic importance/restrictions

4.2.2 All crops

4.2.2.1 Residues in primary crops

The intended uses are not relevant in terms of consumer health protection. Application fields for benzoic acid are disinfection of deposit areas (fleece mats, ebb/flood benches), culture vessels, knives, and gardening equipment by directed coarse spraying, pouring of foam or aqueous solution, dipping or watering without air assistant pressure. Neither plants nor soil will be treated with the compound. Furthermore, benzoic acid is a natural substance in plants and is used extensively as additive in food and feeding stuff. The submission of supervised residue trials is not necessary.

4.2.2.2 Distribution of the residue in peel/pulp

Not relevant.

4.2.2.3 Residues in processed commodities

Not relevant.

4.2.2.4 Proposed pre-harvest intervals, withholding periods

Benzoic acid is used for disinfection of deposit areas and gardening tools and is therefore applied independent of plant growth stages. Setting of a specific PHI in days is not required.

4.3 Consumer intake and risk assessment

The envisaged uses are not relevant in terms of consumer health protection. Furthermore, no MRLs are set for benzoic acid. Benzoic acid is listed in Annex IV of of Regulation (EC) No 396/2005. Therefore, no estimation of consumer intake and risk assessment is necessary.

Table 4.3-1: Consumer risk assessment (Annex IIA, point 6.9, Annex IIIA, point 8.8)

Chronic risk assessment	
ADI	5 mg/kg bw
TMDI (% ADI) according to EFSA PRIMo	Not necessary
NTMDI (% ADI) according to German NVS II	Not necessary
IEDI (% ADI) according to EFSA PRIMo rev.2	Not necessary
NEDI (% ADI) according to German NVS II	Not necessary
Factors included in IEDI and NEDI	None
Acute risk assessment	
ARfD	Not allocated
IESTI (% ARfD) according to EFSA PRIMo rev.2	Not necessary
NESTI (% ARfD) according to German NVS II	Not necessary
Factors included in IESTI and NESTI	None

4.4 Proposed maximum residue levels (MRLs)

Benzoic acid is listed in Annex IV of of Regulation (EC) No 396/2005. No MRLs are set for benzoic acid.

4.5 Conclusion

The intended uses are not relevant in terms of consumer health protection. Application fields for benzoic acid are disinfection of deposit areas (fleece mats, ebb/flood benches), culture vessels, knives, and gardening equipment by directed coarse spraying, pouring of foam or aqueous solution, dipping or watering without air assistant pressure. Neither plants nor soil will be treated with the compound. Furthermore, benzoic acid is a natural substance in plants and is used extensively as additive in food and feeding stuff. The submission of residue data is not necessary.
Due to the low toxicity of the active substance and the low dietary exposure benzoic acid was included in Annex IV of of Regulation (EC) No 396/2005. No MRLs were set. The long-term and the short-term intake of benzoic acid residues are unlikely to present a public health concern.

As far as consumer health protection is concerned, BfR/Germany agrees with the authorization of the intended uses.

Appendix 1 List of data submitted in support of the evaluation

No data were submitted in support of the evaluation and none are necessary.

It has been referenced to:
- Reasoned opinion: First establishment of Annex IV of Regulation (EC) 396/2005; EFSA Scientific Report (2007), 115, 1-161; ASB2012-3636
- Benzoic acid (Monograph); 2000; RMS: Germany; ASB2010-10528

Appendix 2 Detailed evaluation of the additional studies relied upon

No further data provided and none needed.

Appendix 3 Pesticide Residue Intake Model (PRIMo rev.2)

Not necessary.

REGISTRATION REPORT
Part B

Section 5 Environmental Fate

Detailed summary of the risk assessment

Product code: **MENNO Florades**

Active Substance: **Benzoic acid** **90** **g/L**

All Zones
Zonal Rapporteur Member State: Germany

CORE ASSESSMENT

Applicant: **MENNO Chemie-Vertrieb GmbH**

Date: **01/08/2017**

Table of Contents

FATE AND BEHAVIOUR IN THE ENVIRONMENT (KIIIA 9)

This document comprises the risk assessment for groundwater and the exposure assessment of surface water and soil for the plant protection product MENNO Florades containing benzoic acid in its intended uses in rooms, buildings or greenhouses according to Appendix 3.

National Addenda are included containing country specific assessments for some annex points.

5.1 General Information on the formulation

Table 5.1-1: General information on the formulation MENNO Florades

Plant protection product	MENNO Florades
Applicant	MENNO Chemie-Vertrieb GmbH
Date of application	Dec 2013, updated Sep 2014
Formulation type (WP, EC, SC, …; density)	SL
Active substance (as)	benzoic acid
Concentration of as (g/L)	90

5.2 Proposed use pattern

The critical GAPs used for exposure assessment is presented in Table 5.2-1. It has been selected from the individual GAPs in the EU for MENNO Florades. A list of all intended uses within the EU is given in Appendix 3. The following applies for all uses: “No direct treatment of plants, soil or substrates. Only for disinfection.”

Table 5.2-1: Critical use pattern of MENNO Florades

Method	Application area	Water [L/ha], max.	Active substance [kg/ha], max.	Number of applications	Exposure time until full efficacy is reached	Application timing	Product con-centration
Directed coarse spray, foaming (lathering), watering (pouring of aqueous solution or foam), flooding	Protected rooms (Greenhouse, Indoor) in agriculture, horticulture and floriculture, disinfection of surfaces, tools and culture vessels/containers	8000	7.2	1	16 h	Not relevant	1 %
		8000	14.4	1	16 h	Not relevant	2 %
		8000	**28.8**	**1**	**16 h**	**Not relevant**	**4 %**
Dipping		n.a.	n.a.	n.a.	3min	Not relevant	4 %

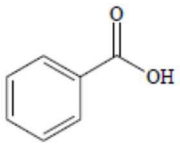
The worst case application rate (indoor/glasshouse) is 28.8 kg Benzoic acid /ha (2880 mg/m²).

5.3 Information on the active substances

5.3.1 Benzoic acid

5.3.1.1 Identity, further information of benzoic acid

Table 5.3-1: Identity, further information on benzoic acid

Active substance (ISO common name)	benzoic acid
IUPAC	benzoic acid
Status under Reg. (EC) No 1107/2009	approved
Date of approval	01/06/2004
Conditions of approval	Only uses as disinfectant may be authorised.
Confirmatory data	none
RMS	DE
Minimum purity of the active substance as manufactured (g/kg)	990 g/kg
Molecular formula	$C_7H_6O_2$
Molecular mass	122.12
Structural formula	

5.3.1.2 Metabolites of benzoic acid

No environmental occurring metabolites of benzoic acid requiring further assessment according to the results of the assessment of benzoic acid for EU approval were detected.

5.3.1.3 Physical and chemical properties of benzoic acid

Physical and chemical properties of benzoic acid as agreed at EU level (see SANCO/1396/2001-Final.) and still considered valid are listed in Table 5.3-2. For some endpoints, since EU approval new studies on the active substance have been performed and as a result the applicant proposed new end-points. The validity of the new data was not checked by zRMS, the data does not differ substancial from the existing data. The new studies may be checked in the EU renewal process. However, the proposed endpoints are also listed in Table 5.3 2.

Table 5.3-2: Overview on agreed EU Physical chemical properties (SANCO/1396/2001-Final) and End-points used in the Evaluation

Property of the active substance	Data on the active substance Benzoic acid		Source (given in Annex II Dossier, 2013)	Remark
	EU agreed endpoints (SANCO/ 1396/2001-Final)	Endpoints proposed by the applicant		
Water solubility [mg/L]	Pure water: pH 2.9: 2.9 g/l (20 °C) Buffer solution: pH 5: 5 g/l pH 9: 15 g/l (20 °C)	2.9 g/l	AIIA-2.6, summary provided in Appendix 2 of this document	Validity of new data not checked by zRMS.
Vapour pressure (at 20°C) [Pa]	0.11 – 0.53 Pa (20 °C)	0.04 – 0.07 Pa (20 °C) Average 0.055 Pa used in risk assessment	AIIA-2.3.1, summary provided in Appendix 2 of this document	Validity of new data not checked by zRMS. The zRMS suggests to use a vapour pressure of 0.1 Pa (20 °C) until new endpoint is found in a EU peer review. 0.1 Pa (20 °C) is commonly found in open literature.
log P_{OW} (n-Octanol /water partition coefficient) (at 20 °C)	log Pow = 1.87	log Pow = 1.9	AIIA-2.8.1, summary provided in Appendix 2 of this document	Validity of new data not checked by zRMS.
Henry's Law Constant [Pa m^3/mol]	0.0046 – 0.022 Pa m^3 mol^{-1} (20 °C)	0.0046 – 0.022 Pa m^3 mol^{-1} (20 °C)	-	-
Hydrolytic stability	stable	stable	-	-
Dissociation constant	pKa = 4.2	pKa = 4.2		

5.4 Summary on input parameters for environmental exposure assessment

5.4.1 Rate of degradation in soil

5.4.1.1 Laboratory studies

Benzoic acid

In the LoEP (see SANCO/1396/2001-Final), it was stated that "The active substance is a compound naturally occurring in soil where it can be readily biodegraded. Contamination of soil following use as a disinfectant according to the GAP is not expected." No data on soil degradation was provided in the LoEP.

For this application, the applicant provided a study (Federle, 1988) on the soil degradation of benzoic acid. A detailed evaluation of this study is presented in Appendix 2.

Table 5.4-1: Summary of aerobic degradation rates for benzoic acid - laboratory studies

Soil type	**DT_{50} (d) 24 °C 20-25% MWHC**	**Method of calculation, Fit**	**Reference**
loamy sand	0.9	SFO	Federle, 1988

From the literature it is known that Benzoic acid is rapidly biodegraded under aerobic and anaerobic conditions in soil.

No relevant metabolites occur.

5.4.1.2 Field studies

Benzoic acid

Soil dissipation studies are not required for the evaluation on the basis of the available information about the active substance, the preparation and the intended uses. No studies have been performed.

5.4.2 Adsorption/desorption

Benzoic acid

In the LoEP (see SANCO/1396/2001-Final), it was stated that "Benzoic acid is not or only slightly adsorbed". For this application, the applicant provided a study (von Oepen, 1991) on the adsorption of several compounds, among them benzoic acid. A detailed evaluation of this study is presented in Appendix 2.

The K_{Foc} values of the study are summarized in Table 5.4-2.

Table 5.4-2: K_F, K_{Foc} and 1/n (Freundlich exponent) values for benzoic acid

Soil Type	OC (%)	pH (-)	K_F (mL g^{-1})	K_{Foc} (mL g^{-1})	1/n (-)	Reference
Podzol	4.85	2.8	3.56	73	0.90	von Oepen, 1991
Alfisol	1.25	6.7	0.23	18	-	von Oepen, 1991

The podzol soil is not an agricultural soil. The applicant proposes to use the K_{Foc} of 18 for the risk assessment. The zRMS agrees.

5.4.3 Rate of degradation in water and sediment

Benzoic acid

Benzoic acid is classified as readily biodegradable in the LoEP (see SANCO/1396/2001-Final). No specific water/sediment study was conducted. Low concentrations of a.s. (0.059 and 59 µg/l) were found to be mineralized to 94.5-98.6 % in water samples from two lakes and 99.4-99.5 % in sewage within 7 days at 29°C.

For this application, the applicant provided a study on stability of several compounds in rain water, among them benzoic acid (Kawamura & Kaplan, 1990). A detailed evaluation of this study is presented in Appendix 2. The results confirm a fas degradation in water samples, the applicant calculated a DT50 of 3.8 days.

5.5 Estimation of concentrations in soil (PEC_{soil}) (KIIIA1 9.4)

From the literature it is known that Benzoic acid is rapidly biodegraded under aerobic and anaerobic conditions in soil (see chapter 5.4.1). Apart from the natural occurrence in soils, due to plant degradation processes, an additional intake of Benzoic acid comes from industrial and automotive emissions. The plant protection product MENNO Florades, containing Benzoic acid as active substance, is exclusively used for the disinfection of surfaces and tools in horticulture (mainly floriculture) and agriculture (e.g. equipment, storage rooms). The application will take place in protected areas. Thus there is no direct application to the soil, but there is the possibility of deposition after volatilization. In the current risk assessment for active substances in the EU process it has been common practice in the past to assume that the emissions to the environment from closed structures such as greenhouses and walk-in tunnels can be considered negligible. In the last years it has become more and more common to assume a deposition value of 0.1 % of the dose rate as drift input to surface water (Linders and Jager, 1997).[1]

Therefore, PEC_{soil} calculations were performed based on the recommendations of the FOCUS workgroup on degradation kinetics. A soil bulk density of 1.5 g/cm^3 and a soil depth of 5 cm were assumed. The PEC_{soil} calculations were performed based on the input parameters as presented in tables below.

Table 5.5-1: Application related input parameters for PEC_{Soil} calculations

Plant protection product	MENNO Florades
Application rate:	28.8 kg benzoic acid /ha
Deposition rate:	28.8 g benzoic acid /ha (0.1 % of dose applied)
Number of applications/interval:	1
Crop interception:	0%

Due to the fast degradation of benzoic acid in soil the accumulation potential of benzoic acid does not need to be considered.

Table 5.5-2: Results of PEC_{soil} calculation for application of MENNO Florades, indoor uses (soil bulk density 1.5 g/cm^{-3}, soil depth 5 cm)

active substance/ preparation	soil relevant application rate (g/ha)	PEC_{act} (mg/kg)
benzoic acid	28.8	0.038

[1] EFSA Guidance Document on clustering and ranking of emissions of active substances of plant protection products and transformation products of these active substances from protected crops (greenhouses and crops grown under cover) to relevant environmental compartments. EFSA Journal 2014;12(3):3615, 43 pp., doi:10.2903/j.efsa.2014.3615

5.6 Estimation of concentrations in surface water and sediment (PECsw/PECsed) (KIIIA1 9.7)

PEC_{sw} and PEC_{sed} calculations are provided according to the recommendations of the FOCUS working group on surface water scenarios in a stepwise approach considering the pathways drainage and runoff. The calculations were performed by the applicant (Becker, 2013, see Appendix 2). Only FOCUS Step 1 was performed.

The relevant input parameters used for PEC calculation are summarized in the tables below.

Table 5.6-1: Input parameters for benzoic acid for $PEC_{sw/sed}$ calculations

Parameter	Endpoint used for $PEC_{sw/sed}$ calculation	Values in accordance to EU endpoint in LoEP	Remarks
Active substance	benzoic acid		
Molecular weight (g/mol)	-		Not required for FOCUS Step 1
Saturated vapour pressure (Pa)	-		Not required for FOCUS Step 1
Water solubility (mg/L)	2.900	yes	
K_{Foc} (mL g^{-1})	18	no	see chapter 5.4.2
DT_{50},soil (d)	-		Not required for FOCUS Step 1
DT_{50},whole system (d)	1000		default

Table 5.6-2: Input parameters related to application for $PEC_{sw/sed}$ calculations

Plant protection product	MENNO Florades
Application rate:	28.8 kg benzoic acid /ha
Deposition rate:	28.8 g benzoic acid /ha (0.1 % of dose applied)
Number of applications/interval	1

Table 5.6-3: Maximum FOCUS Step 1 PEC_{sw} and PEC_{sed} of benzoic acid for the worst case indoor application of MENNO Florades

FOCUS Step 1	PECsw (µg/L)	PECsed (µg/kg)
	9.6399	1.7329

5.7 Risk assessment ground water (KIIIA1 9.6)

5.7.1 Predicted environmental concentration in groundwater (PEC_{GW}) calculation for active substances and metabolites (Tier 1 and 2)

In accordance with the LoEP, the zRMS considers it not necessary to conduct a leaching assessment for this specific active substance in the intended uses.

The intended use is disinfection of materials and surfaces. Soil is treated neither directly nor by run off from plants. Hence, contamination of groundwater through leaching processes is unlikely to occur under GAP conditions. However, the applicant pointed out that there is a possibility due to leaks in the floor that some benzoic acid may seep into the soil underneath the greenhouse and provided a worst case simulation, for details see studies of Becker (2013a, 2013b, 2013c) in Appendix 2.

PEC ground water was calculated with FOCUS PELMO 5.5.3, FOCUS PEARL 4.4.4 and FOCUS MACRO 5.5.3 models including all available scenarios (Châteaudun for FOCUS MACRO) and two different seasons. The application rate was the maximum use rate according to the GAP (28800 g benzoic acid/ha), which would be equal to the assumption of all disinfectant leeking into the ground. The results are presented in the following table.

Table 5.7-1: PEC_{GW} at 1 m soil depth for benzoic acid

Substance	Benzoic acid
Weather/Soil scenario	**Annual concentration in groundwater [µg/L] (80^{th} %ile value in the percolate at 1 m soil depth)**
FOCUS PELMO 5.5.3	
Application date: 15. March	
Châteaudun (C)	0.000
Hamburg (H)	0.004
Jokioinen (J)	0.003
Kremsmünster (K)	0.001
Okehampton (N)	0.039
Piacenza (P)	0.001
Porto (O)	0.001
Sevilla (S)	0.000
Thiva (T)	0.000
Application date: 15. September	
Châteaudun (C)	0.000
Hamburg (H)	0.000
Jokioinen (J)	0.014
Kremsmünster (K)	0.000
Okehampton (N)	0.000
Piacenza (P)	0.000
Porto (O)	0.000
Sevilla (S)	0.000
Thiva (T)	0.000
FOCUS PEARL 4.4.4	
Application date: 15. March	
Châteaudun (C)	0.000000
Hamburg (H)	0.000001

Substance	Benzoic acid
Weather/Soil scenario	**Annual concentration in groundwater [µg/L] (80th %ile value in the percolate at 1 m soil depth)**
Jokioinen (J)	0.000000
Kremsmünster (K)	0.000007
Okehampton (N)	0.001170
Piacenza (P)	0.000015
Porto (O)	0.000034
Sevilla (S)	0.000000
Thiva (T)	0.000000
Application date: 15. September	
Châteaudun (C)	0.000000
Hamburg (H)	0.000049
Jokioinen (J)	0.002594
Kremsmünster (K)	0.000003
Okehampton (N)	0.000026
Piacenza (P)	0.000015
Porto (O)	0.000036
Sevilla (S)	0.000000
Thiva (T)	0.000000
FOCUS MACRO 5.5.3	
Application date: 15. March	
Châteaudun (C)	2.78E-09
Application date: 15. September	
Châteaudun (C)	0.0

5.7.2 Summary of risk assessment for ground water

Even not deemed necessary by the zRMS, the applicant provided a calculation of PEC ground water with FOCUS PELMO 5.5.3, FOCUS PEARL 4.4.4 and FOCUS MACRO 5.5.3 models including all available scenarios (Châteaudun for FOCUS MACRO) and two different seasons and absolute worst case assumptions concerning the application rate. All obtained PEC_{gw} values were below 0.1 µg/L. The FOCUS calculations for Benzoic acid demonstrate that no unacceptable leaching of Benzoic acid into groundwater is to be expected from the intended GAP-use of this product.

5.8 Potential of active substance for aerial transport

The vapour pressure at 20 °C of the active substance benzoic acid is about 0.1 Pa. Hence the active substance benzoic acid is regarded as volatile. According to the FOCUS Air Guidance (SANCO/10553/2006), short-range transport in air has to be considered.

Based on the Atkinson method, the half-life for oxidative photochemical degradation of Benzoic acid in air is 8.612 days (based on a 12 hour day; see Appendix 2, Heimann-Detlefsen, 2013), which is slightly above the trigger for evaluating long range transport of 2 days according to the FOCUS Air Guidance (SANCO/10553/2006). An assessment of long-range transport is therefore required. According to SANCO/10553/2006, this evaluation "…*should include a consideration of the following:*

- *The amount of the substance entering the atmosphere*
- *The likely behaviour of the substance as it is transported in and deposited from the air*
- *The potential impact on and behaviour in remote environments*"

Amount of the substance entering the atmosphere

The product is intended for the use in protected areas, such as greenhouses and storage rooms. A broad distribution of particles is reduced by the main application method "foaming or coarse spraying".

No exprerimental data on the amount entering the atmosphere is available. As described in the chapters 5.5 and 5.6, an assumption for these cases is to consider a deposition rate from closed structures of 0.1%.

The active substance Benzoic acid is a natural compound in the environment and is technically produced in large quantities by the industry (annual production: 600 000 tonnes per year), please refer to chapter 5.9. From data provided by the German producers, emissions of Benzoic acid from industrial processes are published. It has to be pointed out that the amount of Benzoic acid, used as a plant protection product, is less than 0.001 % of the overall production.

Likely behaviour of the substance as it is transported in and deposited from the air

A key consideration for transport in air is whether a substance is transported primarily in the vapour or the particulate phase. Those transported in the particulate phase may have a significantly shorter residence time than the DT_{50} in air might suggest, as they may be "rained out" of the atmosphere in precipitation.

The likely behaviour of the substance as it is transported in the air is determined largely by its physico-chemical properties, specifically its vapour pressure, its solubility in water and its lipophilicity. These factors determine whether the substance will be transported mainly in gaseous form, bound to solid particles, or dissolved in water droplets. For Benzoic acid, the following factors have been calculated by the applicant (not checked by zRMS):

Measured parameter		**Calculated parameter**	
Water solubility	2900 mg/L	*Octanol solubility*	*230355 mg/L*
Log Kow	**1.9**	**Log Kaw**	**- 4.72**
Vapour pressure	0.055 Pa	**Log Koa**	**6.62**

Based on measured water solubility, vapour pressure, and logKow (log Pow) value for Benzoic acid and using Figure 6.1-2 in FOCUS Air Guidance Report (2006)[2] it can be estimated that that Benzoic acid transport in air will be mainly water-bound.

Potential impact on and behaviour in remote environments

The active substance Benzoic acid is a natural compound. It occurs naturally in rain, waters and to a much greater amount in soil and plants (and animals), please see chapter 5.9.

Relation of application rates and deposition

Max. application rate of MENNO Florades is 1x 320L product/ ha (in 4% application solution) which is 28800 g Benzoic acid / ha. The use is intended in protected areas only. Taken into account a deposition rate of 0.1% from closed structures, 28.8 g Benzoic acid /ha is the maximum entry into the environment around the closed application location.

Entry with Rain (Example):

The natural concentration of Benzoic acid in rainwater was reported by Kawamura & Kaplan (1986)[3] with a range of 0.02 – 10.2µg/L (see also chapter 5.9 for other studies). Taken into account the natural concentration in rain and an annual rainfall of 500 mm, the natural entry of Benzoic acid via rain is between 100 g/ha (calculated with 0.02 µg/L) and 51 kg/ha (with 10.2 µg/L), which is 3 to 1771 times higher than the worst case annual entry from the application of MENNO Florades.

Conclusion:

Considering a vapour pressure a volatilisation is relevant. A long range transport is possible, but entrance in the natural compartments by plant protection is low compared to other sources.

[2] Kubiak, R. at al. (2008) Pesticides in air: considerations for exposure assessment. Report prepared by the FOCUS working group on pesticides in air (FOCUS Air Group) **SANCO/10553/2006** rev. 2, June 2008. p. 142

[3] Kawamura K, Kaplan IR (1986) Biogenic and anthropogenic organic compounds in rain and snow samples collected in Southern California. Atmospheric environment, 20:115–124Cited in WHO (2000),Concise International Chemical Assessment Document 26.

5.9 Other/Special Studies

The applicant provided data form open source literature on concentrations of benzoic acid in plant and animal materials and environmental compounds and on emissions from industry. **According to the low relevance of some data for this assessment, the zRMS did not take the time to check on the correct transcription of these figures from the literature to the dossier. However, a note was added in the subchapters whether the data was verified by the zRMS or not.**

5.9.1 Natural background data of benzoic acid in plants

Benzoic acid occurs naturally in free and bound form in many plant and animal species. It is a common metabolite in plants and organisms (Hegnauer, 1992, cited in Anonymous (WHO), KIIA-7.12/03).

Type of sample	Concentration	Reference
Intermediate in the formation of other compounds (i.e. salicylic acid) in tobacco plants	Conjugated Benzoic acid: 100 mg/kg fresh weight 4 mg/kg fresh weight Free Benzoic acid: 0.2 mg/kg	Chong, et al., 2001, KIIA-7.12/01
Radiolabeling studies with potatoes leaves showed that Salicylic acid was synthesized from phenylalanine and that both cinnamic and benzoic acid were intermediates in the biosynthesis pathway.	Not quantified	Coquoz, et al., 1998, KIIA-7.12/02
gum benzoin	20 %	Budavari et al., 1996 (cited in Anonymous 2000, KIIA-7.12/03)
Berries (fruits)	Ca. 0.05 % traces – 14 mg/kg	Budavari et al., 1996; Sieber et al. 1989, (cited in Anonymous 2000, KIIA-7.12/03)
Ripe fruits of several *Vaccinium* species (e.g., cranberry, *V. vitis idaea*; bilberry, *V. macrocarpon*)	300–1300 mg free benzoic acid per kg fruit	Hegnauer, 1966 (cited in Anonymous 2000, KIIA-7.12/03)
Benzoic acid is formed in apples after infection with the fungus *Nectria galligena*	Not quantified	Harborne, 1983 (cited in Anonymous 2000, KIIA-7.12/03)
Benzoic acid is formed in *Pinus thunbergii* callus inoculated with a pathogenic pine wood nematode (*Bursaphelenchus xylophilus)*	Not quantified	Zhang et al., 1997 (cited in Anonymous 2000, KIIA-7.12/03)

zRMS comment: The zRMS did not check the literature cited because of the low relevance for this assessment.

5.9.2 Honey and Propolis

Type of sample	Concentration	Reference
Honey form Coconut and Gelam	79.7 - 184.3 µg Benzoic acid/100g honey	Aljadi et al. 2003 (KIIA-7.12/10)
Propolis	Not quantified	Walker & Crane, 1987 (KIIA-7.12/11)
Products derived from bees	Literature overview, no quantities	Gómez-Caravaca, 2006 (KIIA-7.12/12)

zRMS comment: The zRMS did not check the literature cited because of the low relevance for this assessment.

5.9.3 Ground water

Benzoic acid is present in groundwater mainly through contamination of landfill sources.

Type of sample	Concentration	Reference
From vicinity of underground coal gasification plant 15 months after closure in Wyoming, USA	16–860 µg/L (n = 3)	Stürmer et al. 1982, KIIA-7.12/04
From shallow aquifer in vicinity of business using tar oil (Florida, USA)	10–27 500 µg/L (n = 3)	Goerlitz et al. 1985, KIIA-7.12/05
Contaminated with leachate from landfill for industrial and domestic waste in Ontario, Canada	traces (n = 2) (ca. 100 m distance)	Barker et al. 1988, KIIA-7.12/06
Contaminated with leachate from a gravel pit filled with industrial and domestic waste in Barcelona area, Spain	up to 0.21 (n = 3)	Guardiola et al. 1989 (cited in Anonymous 2000, KIIA-7.12/03)
Contaminated with leachate from landfill for industrial and domestic waste (mainly vegetable waste), October 1981	< 1000 µg/L (ca. 100 m distance and 20 m depth) 17 µg/L (ca. 200 m distance and 25 m depth)	Reinhard et al. 1994 (cited in Anonymous 1993, KIIA-7.12/07)
Contaminated with leachate from landfill for industrial and domestic waste (mainly vegetable waste), October 1981	< 0.1 – 8.8 µg/L	Reinhard et al. 1994 (cited in Anonymous 1993, KIIA-7.12/07)

zRMS comment: The zRMS did not check the literature cited because of the low relevance for this assessment.

5.9.4 Surface water

Data from German producers are available from BUA, 1993 (KIIA-7.12/07) for the emission of Benzoic acid into the rivers.

Rhine

BASF: 40 tons /year (prior wastewater treatment), estimated 2 tons/year after waste water treatment

BUNA: 2.4 tons/year (prior to wastewater treatment)

Emscher canal

Hüls AG: 4.5 tons/year (prior to wastewater treatment)

zRMS comment: The zRMS did not check the literature cited because of the literature was not provided for this assessment.

5.9.5 Soil

The presence of natural background level of benzoic acid in soil is reported by Jalal & Read, 1983:

<table>
<tr><th>Concentration (mg/kg)</th><th>Reference</th></tr>
<tr><td>
Calluna and spruce dominated heathland soils, UK
Levels of benzoic acid in both calluna and spruce dominated mor humus heathland soils followed a seasonal pattern with maximum levels in May and in November. Concentrations of benzoic acid were calculated from the peak areas of the GLC traces (compared with standards of known concentrations).
All concentrations are given in mg/kg.
<table>
<tr><th></th><th>Horizon</th><th>MAR</th><th>APR</th><th>MAY</th><th>JUN</th><th>JUL</th><th>AUG</th><th>SEP</th><th>OCT</th><th>NOV</th><th>DEC</th></tr>
<tr><td rowspan="2">Call-una</td><td>Oh</td><td>1.86</td><td>3.01</td><td>7.50</td><td>2.97</td><td>3.99</td><td>2.69</td><td>1.29</td><td>5.86</td><td>3.03</td><td>4.43</td></tr>
<tr><td>Ah</td><td>0.80</td><td>3.04</td><td>7.54</td><td>9.34</td><td>3.81</td><td>2.23</td><td>0.32</td><td>1.84</td><td>6.99</td><td>3.16</td></tr>
<tr><td rowspan="2">Spurce</td><td>Oh</td><td>4.00</td><td>7.97</td><td>10.82</td><td>6.14</td><td>7.05</td><td>1.37</td><td>0.90</td><td>3.59</td><td>8.38</td><td>6.45</td></tr>
<tr><td>Ah</td><td>-</td><td>1.68</td><td>4.45</td><td>6.19</td><td>4.61</td><td>4.21</td><td>0.14</td><td>3.05</td><td>6.92</td><td>1.91</td></tr>
</table>
</td><td>Jalal & Read ,1983, KIIA-7.12/08</td></tr>
<tr><td>Germany, river terrace soil:
Not quantified</td><td>Cordt & Kußmaul, 1990 (cited in Anonymous 2000, KIIA-7.12/03)</td></tr>
</table>

zRMS comment: The study of Jalal & Read (1983) was checked. The applicant submitted in the original dossier wrong values, as the concentrations measured in both horizons were added together. The values presemted above were provided by the zRMS and are correct.
The article shows the natural occurrence of benzoic acid in amounts exceeding 10 mg/kg. However, the heathland soils are special soils. A range of organic acid were investigated in the study and the assumed phytotoxic and fungitoxic effect of the high acid concentrations is discussed.

5.9.6 Air

Benzoic acid is technically produced in large quantities by the industry (Annual production: 600 000 tonnes per year. Worldwide sodium benzoate production in 1997 can be estimated at about 55 000–60 000 tonnes (see Anonymous 2000, KIIA-7.12/03)). The amount of benzoic acid, used as a plant protection product, is estimated to be less than 0.001 % of the overall production.

Data from German producers are available from 1993 (KIIA-7.12/07) for the emission of Benzoic acid into the atmosphere:

Bayer AG: < 25 kg/year

BASF : 500 kg/year

Type of sample	Concentration	Reference
Rain samples (Los Angeles, USA)	8.6 µg/L	Kawamura & Kaplan 1990, KIIA-7.12/09
Urban air in California (USA)	0.09 – 0.38 µg/m^3	Schützle et al. in Anonymous (WHO) 2000, KIIA-7.12/03

zRMS comment:

Production rates are confirmed. Emissions to atmosphere could not be checked, as literature was not provided.

The study of Kawamura & Kaplan (1990) is described in detail in Appendix 2. The concentrations provided by the applicant in his dossier (0.005 – 0.13 µg/m^3, n = 8) could not be found in Kawamura & Kaplan (1990) but were cited in WHO (2000) as from Kawamura et al. (1985). Instead, two rain samples were used in the study Kawamura & Kaplan (1990), and the initial concentration of benzoic acid in one sample is 8.6 µg/L, whereas the respective data for the other rain sample is not provided in the text.

5.9.7 Conclusion

Generally, benzoic acid can occur in almost all environmental compartments. Whether it exists in the undissociated or dissociated form depends on the specific physicochemical conditions. Above pH 6, the benzoate anion prevails (see point 7.2.1 physical-chemical dissociation in soil).

The active substance benzoic acid is a natural compound in soil and plants and is technically produced in large quantities by the industry (annual production: 600 000 tonnes per year). The amount of benzoic acid, used as a plant protection product is estimated to be less than 0.001 % of the overall production. Regarding the fate and behaviour, it has to be considered that benzoic acid is produced by many plants as an intermediate in the formation of other compounds (i.e. salicylic acid). It occurs in almost every environmental compartments (undissociated or dissociated form), such as air, rain, surface waters and soils. Moreover, it is present in agricultural commodities (i.e. potatoes, beans and cereals), fruits (i.e. *Vaccinium* spp.), milk, honey and nuts as well as many processed products. Furthermore, benzoic acid is detectable in animals and human.

Appendix 1 List of data submitted in support of the evaluation

Table A 1: List of data submitted in support of the evaluation

Annex point/reference No	Author(s)	Year	Title Source (where different from company) Report-No. GLP or GEP status (where relevant), Published or not Authority registration No	Data protection claimed	Owner	How considered in dRR Study-Status/Usage*
KIIA-2.3.1/01	Monte M.J.S, Santos. L.M.N.B.F., Fulem M., Fonseca J.M.S. and Sousa C.A.D.	2006	New Static Apparatus and Vapor Pressure of Reference Materials: Naphthalene, Benzoic Acid, Benzophenone, and Ferrocene. Journal of Chemical & Engineering Data, (51) 757-766. Test facility: -- Report No. – Report date: 2006 Non-GLP, published	N	n.a.	5
KIIA-2.3.1/02	Anonymous	1981	Vapour pressure curve OECD Guideline for Testing of Chemicals, 104, 4. Test facility: -- Report No. – Report date: 1981 Non-GLP, published	N	n.a.	5
KIIA-2.3.2/01	Kellner, G.	2007	Calculation of the Henry's law constant of Benzoic acid, Test facility: ChemCon Chemie Consult GmbH, Kirchlintlen, Germany Report No. – Report date: 17 April 2007 Non-GLP, unpublished	Y	MEN	5
KIIA-2.6/03	Maki T. & Suzuki Y.	1985	Benzoic Acid and Derivates Ullmann's encyclopedia of industrial chemistry, Vol. A3, VCH Verlagsgesellschaft mbH, Weinheim, 555-563. Test facility: -- Report No. – Report date: 1985 Non-GLP, published	N	n.a.	5
KIIA-2.6/04	Lide, D.R. (ed.)	1994	CRC handbook of chemistry and physics. 75th edition. CRC press. Boca Raton, 16-25. Test facility: -- Report No. – Report date: 1994 Non-GLP, published	N	n.a.	5

KIIA-2.8.1/02	Anonymous	1989	OECD Guideline for Testing of Chemicals - Partition Coefficient (n-octanol/water), High Performance Liquid Chromatography (HPLC) Method, 117 Test facility: -- Report No. – Report date: 1989 Non-GLP, published	N	n.a.	5
KIIA-2.8.1/03	Sangster, J.	1989	Octanol-Water Partition Coefficients of Simple Organic Compounds. Journal of Physical and Chemical Reference Data, (18) 3, 1111-1227 Test facility: -- Report No. – Report date: 1989 Non-GLP, published	N	n.a.	5
KIIA-2.9.2/01	Deng, Y. Wellons, A., Bolla, D., Krzyaniak, M., Wylie, H.	2003	Separation and Identification of Photodegradation Products of Benzoic Acid by Capillary Zone Electrophoresis. Journal of Chromatography A, (1013), 191–201. Test facility: -- Report No. – Report date: 2003 Non-GLP, published	N	n.a.	5
KIIA-2.9.2/03	Dryja T.P., Kimball G.P. and Albert D.M.	1980	Light Stimulation of Iris Tyrosinase *in vivo.* Investigative Ophthalmology & Visual Science, (19) 5, 559-562, Test facility: -- Report No. – Report date: 1980 Non-GLP, published	N	n.a.	5
KIIA-2.10/01	Heimann-Detlefsen, D.	2013	Physical-chemical properties of Benzoic acid estimated with epi web v. 4.0 Test facility: DHD-Consulting GmbH Report No. – Report date: May 2013 Non-GLP, published	Y	MEN	1 (not validated by the zRMS)
KIIA-7.1.1/02	Reiner, A. M.	1971	Metabolism of Benzoic acid by bacteria: 3, 5-cyclohexadiene-1, 2-diol-1-carboxylic acid is an intermediate in the formation of catechol. Journal of Bacteriology, 108(1), 89-94.	N	n.a.	5

			Test facility: -- Report No. – Report date: 1971 Non-GLP, published			
KIIA-7.1.2/01	Heider, J., & Fuchs. G.	1997	Anaerobic metabolism of aromatic compounds. European Journal of Biochemistry, 243 (3), 577-596. Test facility: -- Report No. – Report date: 1997 Non-GLP, published	N	n.a.	5
KIIA-7.2.1/04	Federle, T. W.	1988	Mineralization of monosubstituted aromatic compounds in unsaturated and saturated subsurface soils. Canadian Journal of Microbiology, 34(9), 1037-1042. Test facility: -- Report No. – Report date: 1988 Non-GLP, published	N	n.a.	3
KIIA-7.4.1/07	von Oepen, B., Kördel, W. & Klein, W.	1991	Sorption of Nonpolar and Polar Compounds to Soils: Processes, Measurements and Experience with the Applicability of the Modified OECD-Guideline 106. Chemosphere, 22 (3-4), 285-304. Test facility: -- Report No. – Report date: 1991 Non-GLP, published	N	n.a.	3
KIIA-7.8.1/01	Kawamura , K., & Kaplan, I. R.	1990	Stabilities of carboxylic acids and phenols in Los Angeles rainwaters during storage. Water Research, 24(11), 1419-1423. Test facility: -- Report No. – Report date: 1990 Non-GLP, published	N	n.a.	5
KIIA-7.12/01	Chong, J., Pierrel, M. A., Atanassov a, R., Werck-Reichhart, D., Fritig, B., & Saindrenan	2001	Free and conjugated benzoic acid in tobacco plants and cell cultures. Induced accumulation upon elicitation of defense responses and role as salicylic acid precursors. Plant Physiology, 125(1), 318-328. Test facility: -- Report No. –	N	n.a.	5

	, P.		Report date: 2001 Non-GLP, published			
KIIA-7.12/02	Coquoz, J. L., Buchala, A., & Métraux, J. P.	1998	The biosynthesis of salicylic acid in potato plants. Plant physiology, 117(3), 1095-1101. Test facility: -- Report No. – Report date: 1998 Non-GLP, published	N	n.a.	5
KIIA-7.12/03	Anonymous	2000	Benzoic acid and Sodium benzoate. WHO - Concise International Chemical Assessment Document 26. Test facility: -- Report No. – Report date: 2000 (Corrigenda published by 12 April 2005) Non-GLP, published	N	n.a.	5
KIIA-7.12/04	Stuermer, D.H., Ng, D.J., & Morris, C.J.	1982	Organic contaminants in groundwater near underground coal gasification site in Northeastern Wyoming. Environmental Science and Technology, 16, 582–587. Test facility: -- Report No. – Report date: 1992 Non-GLP, published	N	n.a.	5
KIIA-7.12/05	Goerlitz, D.F., Troutman, D.E., Godsy, E.M., & Franks, B.J.	1985	Migration of wood-preserving chemicals in contaminated groundwater in a sand aquifer at Pensacola, Florida. Environmental Science and Technology, 19(10), 955–961. Test facility: -- Report No. – Report date: 1985 Non-GLP, published	N	n.a.	5
KIIA-7.12/06	Barker, J.F., Barbash, J.E., & Labonte, M.	1988	Groundwater contamination at a landfill sited on fractured carbonate and shale Journal of Contaminant. Hydrology, 3, 1–25. Test facility: -- Report No. – Report date: 1988 Non-GLP, published	N	n.a.	5
KIIA-7.12/07	Anonymous	1993	Benzoic acid / Sodium benzoate ed. GDCH-Advisory Committee on Existing chemicals of Environmental			

			Relevance. Beratergremium für umweltrelevante Altstoffe / BUA) Test facility: -- Report No. BUA Report 145. Report date: 1993 Non-GLP, published			
KIIA-7.12/08	Jalal, M. A. F., & Read, D. J.	1983	The organic acid composition of Calluna heathland soil with special reference to phyto-and fungitoxicity. Plant and Soil, 70, 273-286. Test facility: -- Report No. – Report date: 1983 Non-GLP, published	N	n.a.	5
KIIA-7.12/09	Kawamura, K., & Kaplan, I.R.	1990	Stabilities of carboxylic acids and phenols in Los Angeles rainwaters during storage. Water Residues, 24(11), 1419-1423. Test facility: -- Report No. – Report date: 1990 Non-GLP, published	N	n.a.	5
KIIA-7.12/10	Aljadi, A. M., & Yusoff, K. M.	2003	Isolation and identification of phenolic acids in Malaysian honey with antibacterial properties. Turkish Journal of Medical Sciences, 33(4), 229-236. Test facility: -- Report No. – Report date: 2003 Non-GLP, published	N	n.a.	5
KIIA-7.12/11	Walker, P., & Crane, E.	1987	Constituents of propolis. Apidologie, 18(4), 327-334. Test facility: -- Report No. – Report date: 1987 Non-GLP, published	N	n.a.	5
KIIA-7.12/12	Gómez-Caravaca, A. M., Gómez-Romero, M., Arráez-Román, D., Segura-Carretero, A., & Fernández-Gutiérrez, A.	2006	Advances in the analysis of phenolic compounds in products derived from bees. Journal of Pharmaceutical and Biomedical Analysis, 41(4), 1220-1234. Test facility: -- Report No. – Report date: 2006 Non-GLP, published	N	n.a.	5

KIIIA1-9.6.1/01	Becker, E.-M.	2013	MENNO Florades: Predicted environmental concentrations (PEC) of Benzoic acid in groundwater using FOCUS PELMO 5.5.3 for application in cereals DHD-Consulting GmbH, Hildesheim, Germany Report no.: MEN-2013-04 Report date: 13 June 2013 Non-GLP, unpublished	Y	MEN	1
KIIIA1-9.6.1/02	Becker, E.-M.	2013	MENNO Florades: Predicted environmental concentrations (PEC) of Benzoic acid in groundwater using FOCUS PEARL 4.4.4 for application in cereals DHD-Consulting GmbH, Hildesheim, Germany Report no.: MEN-2013-03 Report date: 13 June 2013 Non-GLP, unpublished	Y	MEN	1
KIIIA1-9.6.1/03	Becker, E.-M.	2013	MENNO Florades: Predicted environmental concentrations (PEC) of Benzoic acid in groundwater using FOCUS MACRO 5.5.3 for application in cereals DHD-Consulting GmbH, Hildesheim, Germany Report no.: MEN-2013-05 Report date: 13 June 2013 Non-GLP, unpublished	Y	MEN	1
KIIIA1-9.7/01	Becker, E.-M.	2013	MENNO Florades: Calculation of PEC_{SW} for Benzoic acid using FOCUS Surface water Tool for Exposure Predictions Step 1 and a deposition rate from greenhouse of 0.1% DHD-Consulting GmbH, Hildesheim, Germany Report no.: MEN-2013-08 Report date: 01 August 2013 Non-GLP, unpublished	Y	MEN	1

*

1) accepted (study valid and considered for evaluation)
2) not accepted (study not valid and not considered for evaluation)
3) not considered (study not relevant for evaluation)
4) not submitted but necessary (study not submitted by applicant but necessary for evaluation)
5) supplemental (additional information, alone not sufficient to fulfil a data requirement, considered for evaluation)

Appendix 2 Detailed evaluation of studies relied upon

KIIA 2 Physical and chemical properties– Active Substance

Summary of physical and chemical properties of the active substance Benzoic acid (CAS: 65-85-0, EINECS: 200-618-2, Molecular formula: $H_6C_7O_2$, Molecular mass: 122.12)

OECD data point	Method	Test material purity/ specif.	Results	Comments	GLP Y/N	Reference
AIIA-2.3.1 Vapour pressure of purified active substance	The pressure was measured by a capacitance diaphragm absolute gage; temperature was measured at 37°C	Benzoic acid: NIST standard reference material 39i (x = 0.99997, determined by freezing point measurements); material was used without any further purification	Vapour pressure at 37°C was 0.449 Pa. Calculated vapour pressure at 20°C (following Clausius–Clapeyron equation): **0.0628 Pa**		N	*KIIA-2.3.1/01 Monte, M.J.S. et al. (2006)*
	Gas saturation method (OECD), 2 laboratories and vapour pressure balance (OECD), 2 laboratories	Benzoic acid, OECD reference material provided for EEC-laboratory intercomparison testing	**0.04 – 0.07 Pa** at 20°C (gas saturation: 0.07 Pa, Balance: 0.05 Pa); 0.48 - 0.89 Pa at 40°C (gas saturation: 0.76 Pa, Balance: 0. 56 Pa)		-	*KIIA-2.3.1/02 Anonymous (1981)*
AIIA-2.3.2 Henry's law constant	Calculation	Benzoic acid	Henry's law constant is 0.0046 - 0.022 Pa * m³ * mol^{-1} (at 20 °C)		N	*KIIA-2.3.2/01 Kellner (2007)*
AIIA-2.6 SOLUBILITY OF PURIFIED ACTIVE SUBSTANCE IN WATER: DETERMINED IN THE NEUTRAL RANGE, DETERMINED IN THE ACIDIC	EEC method A.6 Water Solubility (OJ EC L 383 A, vol. 35 (1992)); Test substance: Flask-method	Benzoic acid, 99.0 - 105.5% purity, batch No. 3/48	Conditions	Solubility [g/L]	N	*KIIA-2.6/02 Kellner, G. (1998)*
			Buffer solution: pH 5.2, 20°C	5.0		
			Buffer solution: pH 9.0, 20°C	15.0		
			pure water, 20°C	2.9		
		Benzoic acid	[°C] [g/L]	Water solubility is	N	*KIIA-2.6/03*

OECD data point	Method	Test material purity/ specif.	Results	Comments	GLP Y/N	Reference
RANGE (PH 4 TO 6), DETERMINED IN THE ALKALINE RANGE (PH 8 TO 10)			80: 27.5 70: 17.7 60: 12.0 50: 8.5 40: 6.0 30: 4.2 25: 3.4 20: 2.9 10: 2.1 0: 1.7	dependent on temperature. Water solubility increases with increasing temp.		*Maki, T. & Suzuki, J.(1985)*
		Benzoic acid	Solubility of benzoic acid in water at 18°C is 2.7 g/L.		N	*KIIA-2.6/04 Lide, D.R. (1994)*
AIIA-2.8.1 n-octanol/ water partition coefficient		Benzoic acid	Benzoic acid has a partition coefficient of log P_{ow} = 1.87 (the given log P_{ow} 1.87 is for the unionised molecule, which exists in acidic media; for the completely ionised benzoate, which exists in alkaline medium, the log P_{ow} is -2.27)		N	*KIIA-2.8.1/01 Freitag, D. et al. (1985)*
	OECD Test Guideline 117 (measurements with HPLC)	Benzoic acid	log P_{ow} = 1.9 (The values were checked for plausibility and quality during inter-laboratory comparison test, determined pKa was 4.19)		N	*KIIA-2.8.1/02 Anonymous (1989)*
		Benzoic acid	Log p_{ow} | °C | method | Analysis | pH | phase analysed 1.68 | 25 | SF | AS | W | W +AQ 1.87 | 25 | SF | AS | W | AQ 1.88 | 25 | SF | AS | 0.5 | AQ 1.94 | - | SF | RC | 0.5 | W +AQ 1.87 | 25 | microelectrometric titration 1.97 | 25 | microelectrometric titration SF = shake flask; AS = absorbtion spectrophotometry; RC = Radiochemical titration; W = octanol-saturated water solvent; AQ = octanol-saturated water phase		N	*KIIA-2.8.1/03 Sangster, J. (1989)*
AIIA-2.9.2	CZE method: solutions in deionized water,	Benzoic acid, obtained from Fluka	No photo-degradation was observed in pure water (within 210 min, irradiated with 300 nm).		N	*KIIA-2.9.2/01 Deng, Y. et al.*

OECD data point	Method	Test material purity/ specif.	Results	Comments	GLP Y/N	Reference
Direct phototransformation of purified active substance in water using artificial light (simulating sunlight and excluding wavelengths < 290 nm) under sterile conditions, to include: photochemical half-life; mass balance to account for 90 % of the applied radioactivity; identity of the breakdown products	concentrations: 3.0–1.00 x 10^2 m*M,* electro-phoretic analyses with Beckman capillary electrophoresis system; buffer containing 13 m*M* sodium borate at pH 10.00+/- 0.10, applied voltage: 15 kV, pressure sample injection time: 26 s, UV detection at 214 nm, capillary: 57 cm x 75 µm I.D. temperature: 22 °C; irridation at 300 nm for 210 min measurements with UV–visible spectrophotometer	(Milwaukee, WI, USA), water solution contained benzoic acid (1.00x 10^2 µ*M*)	Benzoic acid is stable.			*(2003)*
	SANCO/11802/2010 Rev. 7 Erlenmeyer flasks; pH = 8; artificial irradiation at 275 W, according to KIIA 2.9.2/03 the wavelength exceeds 295 nm (4 cm distance), exposure for 24 to 137 hours	Benzoic acid, purest commercial grade	A direct phototransformation does not occur because benzoic acid is a very stable compound (aromatic monocarbon acid), as described. Breakdown products do not occur. The half-life time will be more than 1 year. The emission of the of the employed General Electric 275-W RS sunlamp (in KIIA-2.9.2/02) at > 295 nm is reported in KIIA-2.9.2/03		N	*KIIA-2.9.2/02 Ware, G.W. et al. (1980)* *KIIA-2.9.2/03 Dryja, T.P. et al. (1980)*
AIIA-2.10 Estimated photochemical oxidative degradation	Estimation method according to Atkinson (AopWin v1.91)	Benzoic acid	Atmospheric Oxidation (25 deg C) / Hydroxyl Radicals Reaction:OVERALL OH Rate Constant = 1.2420 10-12 cm3/molecule-sec Half-Life = 8.612 Days (12-hr day; 1.5*106 OH/cm3) Half-Life = 103.345 Hrs		N	*KIIA-2.10/01 Heimann-Detlefsen (2013)*

Comments of zRMS:	Studies and presented results of the physical and chemical properties were not checked by the zRMS.

KIIA 7 Fate and Behaviour in the Environment – Active Substance

KIIA-7.1.1 Reiner (1971)

2.	**Ref. Point:**	**KIIA-7.1.1/02, Aerobic degradation of Benzoic acid**
3.	**Authors:**	Reiner, A.M. (1971)
	Title	Metabolism of Benzoic acid by bacteria: 3,5-cyclohexadiene-1,2-diol-1-carboxylic acid is an intermediate in the formation of catechol
	Test facility,	-
	Report-No.:	-
	Owner:	-
	Report date:	1971
4.	**Test facility:**	-
5.	**Dates of experimental work:**	-
6.	**Test substance:**	Benzoic acid / [carboxyl-^{14}C] Benzoic acid
7.	**Guideline / Test method:**	non-GLP
	Deviations:	None reported
8.	**GLP:**	No

Executive Summary

Benzoic acid as sole carbon and energy source can support growth of a variety of microorganisms. The conversion of [^{14}C]Benzoic acid to [^{14}C]dihydrodihydroxyBenzoic acid was assessed in cell extracts. Bacteria are able to transfer Benzoic acid to 1,2-dihydro-1 ,2-dihydroxyBenzoic acid (DHB) by a peroxidation mechanism. DHB is subsequently transformed to catechol (under reduction of NAD). The Benzoic acid oxygenase system is unstable in extracts. DHB is implicated as an intermediate between Benzoic acid and catechol in the four bacterial genera tested here (A*cinetobacter, Alcaligenes, Azotobacter*, and three *Pseudomonas* species) and presumably is an intermediate generally in the conversion of Benzoic acid to catechol in bacteria. However, as decarboxylation can occur also at unhydroxylated ring positions, the conversion of Benzoic acid to catechol via 2,3- or 3,4-dihydroxyBenzoic acid and not via DHB may prove to be an alternative route in some other microorganism.

Fig. 7.1.1-1 β-Ketoadipic acid pathway often used by bacteria for the degradations of Benzoic acid and tryptophan

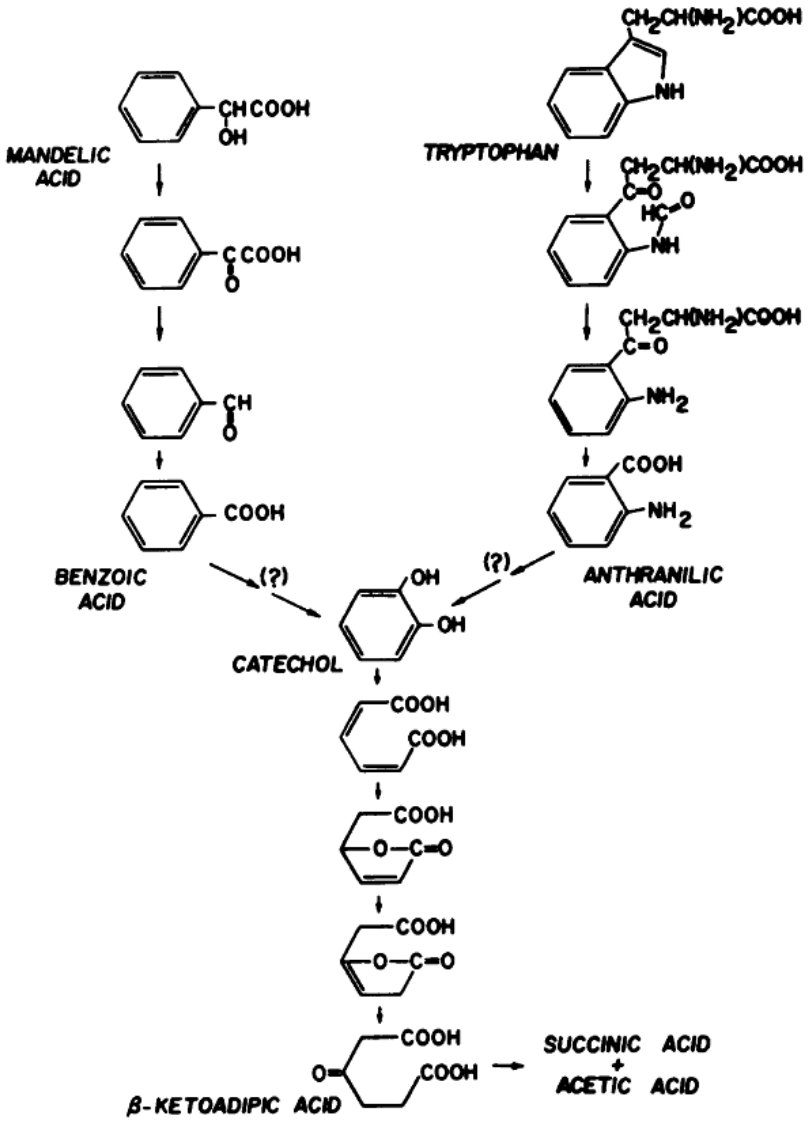
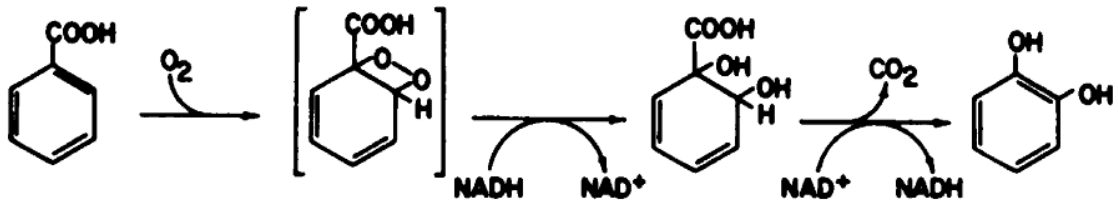


Fig. 7.1.1-2 Conversion of Benzoic acid to catechol via I ,2-dihydro-1,2-dihydroxyBenzoic acid in bacteria



I. MATERIALS AND METHODS

A. MATERIALS

Test Material:	0.1 µmole of [Carboxy/- ^{14}C] Benzoic acid (56µCi/ µmole) was purchased from Amersham-Searle Corp., Arlington Hts., Ill., and was purified by thin-layer chromatography
CAS no.:	65-85-0
Description:	Solid
Lot/Batch#:	Not stated
Purity:	Not stated
Solvent used:	Tris-hydrochloride, (pH 7.0)

B. STUDY DESIGN

1. Experimental conditions:

Source and growth of bacteria: *A. eutrophus* strain B9 was supplied by B. Johnson. The following strains were from the cu1ture collection of the Department of Bacteriology and lmmunology, University of Califomia, Berkeley: *Acinetobacter calcoaceticus* 73 (formerly designated *Moraxella calcoacetica* 73) *Alcaligenes eutrophus* 335 (ATCC 17697, formerly designated *Hydrogenomonas eutropha*), *Azotobacter vinelandii*, *Pseudomonas aeruginosa* 132 (ATCC 17504), *P. cepacia* 249 and *P. cepacia* 382 (ATCC 17616 and ATCC 17759, former1y designated *P. multivorans* 249 and 382)
P. putida 90 (ATCC 12633), and *P. testosteroni* 16 (ATCC 15668). Cells were grown in liquid HM8 medium (20) at 30°C on a rotary shaker. Carbon sources other than succinic acid were supplied so that their concentrations in the culture medium never exceeded 2 mM. Succinic acid, if present, was supplied at 7 mM.

Preparation of cell extracts: Cultures were harvested by centrifugation at 6 x 10^8 to 8 x 10^8 cells/ml, determined turbidimetrically. Cells were washed and suspended at 1011/ml in 0.02 M tris(hydroxymethyl)aminomethane (Tris)-hydrochloride (pH 8.0) and were disrupted by sonic oscillation for three periods of 2 min each. Debris was removed by centrifugation at 15,000 x g for 15 min. Supernatant fractions of extracts were prepared by centrifugation at I 00,000 x g for 90 min.

Reaction products from [^{14}C] Benzoic acid: Each reaction took place in a 25-ml flask sealed by a serum cap. Through the cap hung a plastic center well containing 0.15 ml of 1 M Hyamine to trap CO_2. The flask contained 0.5 to 1 mg of cell protein (supernatant fraction) from extracts of cells grown on Benzoic acid. The reaction was started by injecting, through the serum cap, 75 µmoles of Tris-hydrochloride, (pH 7.0), 0.5 µmole of NADH, 0.05 µmole of $FeSO_4$, 0.1 µmole of Benzoic acid, and [carboxyl-^{14}C] Benzoic acid to reach a final volume of 0.5 ml. Incubation was at 25°C with gentle shaking.

2. Sampling

The reaction was stopped after 4 min by injecting 0.2 ml of a 1/100th dilution of glacial acetic acid. This rendered the medium sufficiently acidic to release CO_2 from solution but not to decompose the acid-labile DHB. The flask was gently shaken for an additional 15 min, and the center well was then removed and placed in a vial containing Bray's scintillation fluid for measurement of its [^{14}C]CO_2 content. Other reaction products were separated by thin-layer chromatography.

3. Description of analytical procedures:

Chromatography of ^{14}C reaction products. The acidified contents of reaction flasks were centrifuged to remove the precipitates, and 2-µliter samples of each supernatant were spotted onto three silica gel, thin-layer chromatography sheets (Eastman 6060, type K301R with fluorescent indicator). Unlabeled Benzoic acid, salicylic acid, and DHB were added to each spot as markers. Each sheet was then developed in one of three solvent systems and dried. The marker compounds, which were visible as quenching spots, were outlined under ultraviolet light. Sheets were cut into strips corresponding to each spot originally applied, and each strip was cut along its length into 20 to 30 segments. The radioactivity of each segment was measured by scintillation. Solvent A consisted of benzene-methanol-acetic acid (8:3:1); Benzoic acid, RF 0.67; DHB, RF 0.23. Solvent 8 consisted of benzene-methanol-acetic acid (4:6:1); Benzoic acid, RF 0.79; DHB, RF 0.64. Solvent C consisted of ether-toluene-acetic acid (10: 2: I); Benzoic acid, RF0.62; DHB, RF 0.19.

Protein concentrations were measured by the method of Lowry et al. (1951), with crystalline bovine serum albumin as standard. Catechol was measured by the method of Arnow (1937). Respiration rates were measured with a Gilson Differential Respirometer.

II. RESULTS AND DISCUSSION

A. Conversion of DHB to catechol and of Benzoic acid to DHB in cell extracts

An NAD-dependent DHB dehydrogenase activity is found at high levels in extracts prepared from bacteria grown in the presence of Benzoic acid. Approximately 1 mole of catechol and 1 mole of NADH are formed from 1 mole of DHB and 1 mole of NAD, and neither product is formed without the addition of both DHB and NAD.
The activities in extracts of induced cells are sufficient to account for the rates of consumption of Benzoic acid by intact cells, measured separately by respirometry. No activity was detected in cells which were not induced by Benzoic acid. The physiological role of DHB dehydrogenase is supported by its absence from two strains which were included as controls

Because of the instability of Benzoic acid oxygenase in cell extracts, high concentrations of cell protein were required to demonstrate Benzoic acid oxidation in extracts. Since the conversion of DHB to catechol

proceeds rapidly in extracts, precautions were necessary to show the formation of DHB from Benzoic acid. This was accomplished by choosing conditions relatively unfavorable for DHB dehydrogenase and by using isotope labeling.

Cell extracts were incubated with [carboxy/-^{14}C] Benzoic acid. At the buffer conditions selected (0.15 M Tris, pH 7.0), DHB dehydrogenase activity was more than 90% inhibited, whereas Benzoic acid oxidation was near its maximum rate. The reaction products were separated. For each extract tested, a portion of the label was recovered as [^{14}C] DHB. When unlabeled DHB was added to the reaction mixture, additional label was "trapped" as DHB, with a corresponding reduction in [^{14}C] CO_2 release. The identity of the [^{14}C] DHB was confirmed by co-chromatography with unlabeled DHB in three solvent systems. No radioactive spots other than those of [^{14}C] DHB and [^{14}C] Benzoic acid were detected.
In the formation of DHB from Benzoic acid, an electron donor is needed. That NADH is required and that reduced nicotinamide adenine dinucleotide phosphate (NADPH) cannot substitute was shown for *A. calcoaceticus*. DHB dehydrogenase, which was used in this assay to catalyze the release of [^{14}C]CO_2 from [^{14}C]DHB, was present in excess. The NAD which it requires is presumably formed from NADH in the first reaction. lt was reported previously that Benzoic acid oxidation proceeds with either NADH or NADPH in *P. flourescens*.

B. No evidence for DHB in related pathways

Experiments were performed to investigate whether anthranilic acid (o- aminoBenzoic acid) or phthalic acid (o-carboxyBenzoic acid) were metabolized via DHB. The conversion of anthranilic acid to catechol is not well understood and could involve DHB and DHB dehydrogenase. To test for this pathway in *Acinetobacter*, cells were induced to metabolize anthranilic acid, and the level of DHB dehydrogenase was measured. Induction was achieved by growing the cells on tryptophan, which is metabolized via anthranilic acid and catechol in many bacteria. Rapid metabolism of anthranilic acid and catechol by whole cells was confirmed by respirometry. No DHB dehydrogenase was found, however. In A. eutrophus, mutant strain B9 Iacks DHB dehydrogenase. The ability of this strain to respire on anthranilic acid (after induction with tryptophan) was found to be unimpaired, indicating that *A. eutrophus* does not metabolize anthranilic acid via DHB.

C. Discussion

A. eutrophus mutant strain B9 recently was shown to convert Benzoic acid to DHB, apparently via a peroxidation mechanism. Evidence presented here shows that extracts from several bacterial species convert Benzoic acid to DHB and convert DHB to catechol with the concomitant reduction of NAD. The conversion of Benzoic acid to catechol thus involves the formation of DHB by the Benzoic acid oxygenase system which is unstable in extracts, and the dehydrogenation and decarboxylation of DHB by a previously unknown enzyme which is stable in extracts.
DHB is implicated as an intermediate between Benzoic acid and catechol in the four bacterial genera tested here and presumably is an intermediate generally in the conversion of Benzoic acid to catechol in bacteria. However, as decarboxylation can occur also at unhydroxylated ring positions, the conversion of Benzoic acid to catechol via 2, 3- or 3, 4-dihydroxyBenzoic acid and not via DHB may prove to be an alternative route in some other microorganism.

Since *meta*- and para-substituted Benzoic acids are not generally metabolized via catechol, it appears that DHB is a metabolite unique to the Benzoic acid pathway.
DHB does not support growth of any of the bacteria used in this study. This is not unexpected for an intermediary metabolite whose polarity would make passive transport through the cell membrane difficult and which is unlikely to be found extracellularly in sufficient amounts to warrant an active transport system.

Fig. 7.1.1-3 β-Ketoadipic acid pathway often used by bacteria for the degradations of Benzoic acid and tryptophan

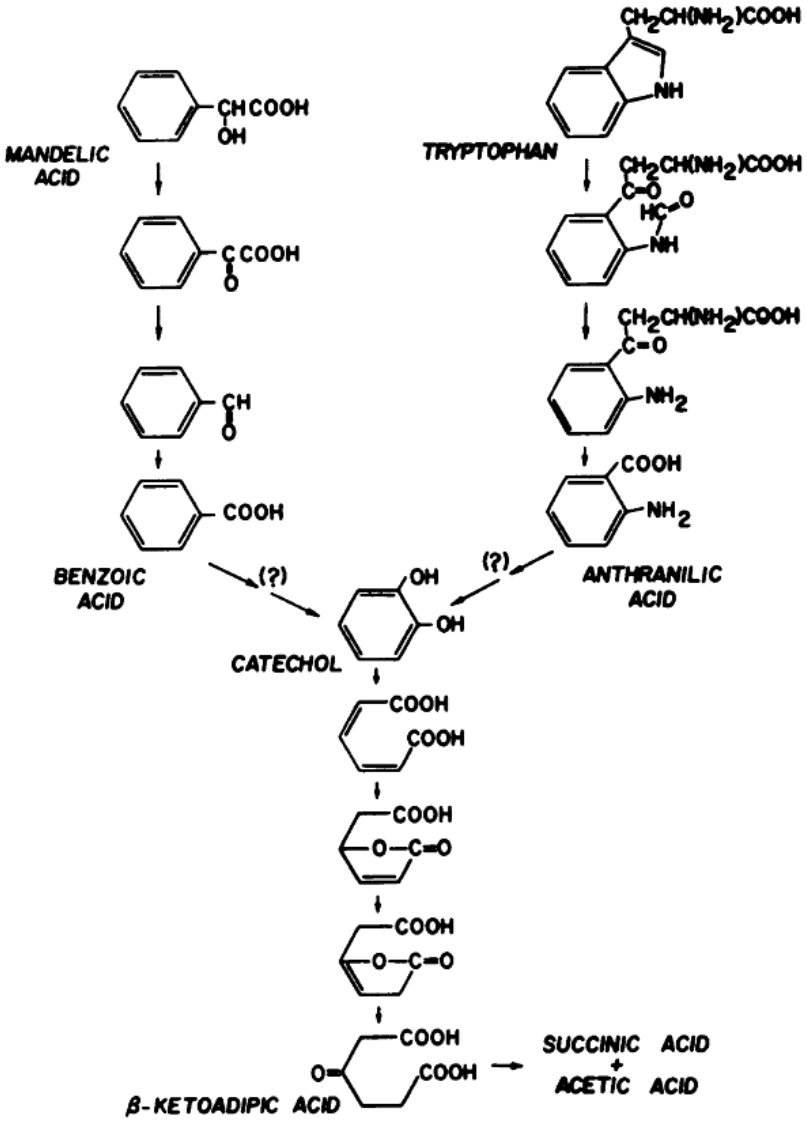
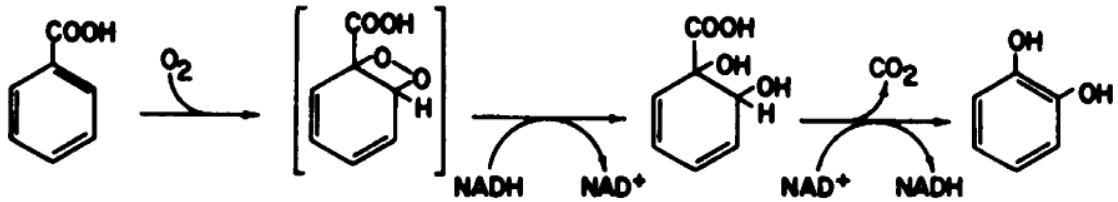


Fig. 7.1.1-4 Conversion of Benzoic acid to catechol via 1,2-dihydro-1,2-dihydroxyBenzoic acid in bacteria



D. Validation of the analytical method

Table 7.1.1-1 Products recovered after incubation of [carboxyl- ^{14}C] benzoate with cell extracts*

	Source of extract					
	Alcaligenes eutrophus 335		*Acinetobacter calcoaceticus* 73		*Pseudomonas putida 90*	
	No DHB added	40 mm DHB added	No DHB added	40 mm DHB added	No DHB added	40 mm DHB added
[^{14}C] CO_2	1370	14	901	25	162	14
[^{14}C] DHB	1092	2539	362	1331	1161	1214
[^{14}C] Benzoic acid	3617	3709	5144	4812	4660	4710

* Figures indicate counts per minute per microliter of reaction mixture. At start of reactions, [^{14}C]Benzoic acid was present at 6400 counts per min per µliter

III. CONCLUSIONS

DHB is implicated as an intermediate between Benzoic acid and catechol in the four bacterial genera tested here (A*cinetobacter, Alcaligenes, Azotobacter*, and three *Pseudomonas* species) and presumably is an intermediate generally in the conversion of Benzoic acid to catechol in bacteria.

Reviewers comment on KIIA-7.1.1/02:

The aerobic pathway, as described in this study is applicable for a generalized description of the aerobic benzoate pathway in soil because the selected species occur naturally in soil (see table below)

Table 7.1.1-2 Overview on the natural occurrence of bacterial species used in this study:

Organism	**Occurrence in**
Alcaligenes eutrophus	Soils and sediments
Acinetobacter calcoaceticus	Widespread, diverse habitats including soil
Azotobacter vinelandii	Soil
Pseudomonas aeruginosa	Soil, water, man-made habitats
Pseudomonas cepacia	Soil and water
Pseudomonas multivorans	Soil and water
Pseudomonas putida	Soil
Pseudomonas testosteroni	Soil

Comments of zRMS:	Not considered relevant for this assessment.

KIIA-7.1.2 Heider & Fuchs (1997)

2.	**Ref. Point:**	**KIIA-7.1.2/01, Anaerobic degradation of Benzoic acid**
3.	**Authors:**	Heider, J. & Fuchs, G. (1997)
	Title	Anaerobic metabolism of aromatic compounds, European journal of biochemistry, FEBS, 243 (3), 577-596
	Test facility,	-
	Report-No.:	-
	Owner:	-
	Report date:	1997
4.	**Test facility:**	-
5.	**Dates of experimental work:**	-
6.	**Test substance:**	*Review article*, no experiments performed
7.	**Guideline / Test method:**	non-GLP
	Deviations:	None reported
8.	**GLP:**	No

Executive Summary

Aromatic compounds comprise a wide variety of low-molecular-mass natural compounds (amino acids, quinones, flavonoids, etc.) and biopolymers (lignin, melanin). They are almost exclusively degraded by microorganisms. Aerobic aromatic metabolism is characterized by the extensive use of molecular oxygen. Monoxygenases and dioxygenases are essential for the hydroxylation and cleavage of aromatic ring structures. Accordingly, the characteristic central intermediates of the aerobic pathways (e.g. catechol) are readily attacked oxidatively. Anaerobic aromatic catabolism requires, of necessity, a quite different strategy. The basic features of this metabolism have emerged from studies on bacteria that degrade soluble aromatic substrates to CO_2, in the complete absence of molecular oxygen.
Essential to anaerobic aromatic metabolism is the replacement of all the oxygen-dependent steps by an alternative set of novel reactions and the formation of different central intermediates (e.g. benzoyl-CoA) for breaking the aromaticity and cleaving the ring; notably, in anaerobic pathways, the aromatic ring is reduced rather than oxidized. The two-electron reduction of benzoyl-CoA to a cyclic diene requires the cleavage of two molecules of ATP to ADP and P_i, and is catalyzed by benzoyl-CoA reductase. After nitrogenase, this is the second enzyme known which overcomes the high activation energy required for reduction of a chemically stable bond by coupling electron transfer to the hydrolysis of ATP. The alicyclic product cyclohex-1,5-diene-l-carboxyl-CoA is oxidized to acetyl-CoA via a modified β-oxidation pathway; the ring structure is opened hydrolytically. Some phenolic compounds are anaerobically transformed to resorcinol (1,3-dihydroxybenzene) or phloroglucinol (1,3,5-trihydroxybenzene). These intermediates are also first reduced and then as alicyclic products oxidized to

acetyl-CoA. This review gives an outline of the anaerobic pathways which allow bacteria to utilize aromatics even in the absence of oxygen. The authors focus on previously unknown reactions and on the enzymes characteristic for such novel metabolism.

I. MATERIALS AND METHODS

A. MATERIALS

Test Material:	*Review article*, no experiments performed
CAS no.:	*Review article*, no experiments performed
Description:	*Review article*, no experiments performed
Lot/Batch#:	*Review article*, no experiments performed
Purity:	*Review article*, no experiments performed
Solvent used:	

B. STUDY DESIGN

1. Experimental conditions:

Review article, no experiments performed

2. Sampling

Review article, no experiments performed

3. Description of analytical procedures:

Review article, no experiments performed

II. RESULTS AND DISCUSSION

A. Review on the anaerobic degradation of benzoate

This review deals with the art of degrading aromatic compounds to CO_2, in the complete absence of molecular oxygen. This ability allows bacteria to make use of natural compounds of this widespread class as substrates for growth under anoxic conditions. In nature, anoxic conditions are created when oxygen consumption exceeds its supply. This situation prevails in many environments, e.g. in the intestinal tract of animals and man, in the sediments of all natural bodies of water, in ground water and in part in soil.

In general, two strategies are known for the degradation of aromatic compounds in soil, an oxygen-dependent and anoxic metabolism. Both types include a peripheral and a central pathway. Peripheral pathways convert (enzymatically) the large variety of aromatic compounds into a few central aromatic intermediates. The central intermediate produced is generally ready to be dearomatised.

The anaerobic pathways use a reductive biochemistry, including other reactions such as carboxylations, reductive dehydroxylations, addition reactions etc., all absent in aerobic metabolism.

The most common central intermediate of anaerobic aromatic metabolism is **benzoyl-CoA**, the thioester of coenzyme A with Benzoic acid. The nucleotide part of the coenzyme A probably functions to facilitate binding of the substrate and ensure correct positioning of the thioesterified aromatic acid in the active center of the enzyme. Mechanistically and thermodynamically, the important substituent is probably just the thioesterified carboxyl group adjacent to the benzene ring. Two other central intermediates of anaerobic pathways are **resorcinol** and **phloroglucinol**. They each contain two or three phenolic hydroxyl groups in meta-positions relative to each other.

Microorganisms able to degrade aromatics can normally use dozens of different organic compounds as growth substrates, including a variety of aromatic compounds. The anaerobic degradation of aromatic substrates is initiated by transforming them to a few central aromatic intermediates, as mentioned above.

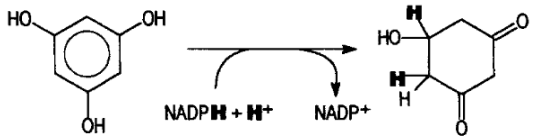
The most common central intermediate in anaerobic aromatic metabolism is benzoyl-CoA. The common key enzyme for ring reduction in these metabolic routes is benzoyl-CoA reductase (de-aromatising). Benzoyl-CoA reductase activity has been detected in various denitrifying bacteria. The reaction catalysed (see Equation below) is a two-electron reduction of the aromatic ring of benzoyl-CoA to cyclohex- 1 ,5-diene-l -carboxyl-CoA at the expense of the hydrolysis of two ATP molecules.

C_6H_5-CO-SCoA + 2 MgATP + 2 e^- + 2 H^+ + 2 H_2O → + C_6H_7- CO-SCoA + 2 MgADP + 2 P_i

The natural electron donor of benzoyl-CoA reductase is a ferredoxin. This protein is able to donate both electrons needed for benzoyl-CoA reduction. Benzoyl-CoA reductase is highly specific for ATP. The product ADP acts as a competitive inhibitor (K, = 1 mM) for ATP (K, = 0.6 mM). The product of benzoyl-CoA reduction, cyclohex-1,5-diene-1-carboxyl-CoA, is oxidised so that 1 molecule produces 3 molecules of acetyl-CoA and l of CO_2 in a sequence of reactions that are analogous to β-oxidation.

The basic features of anaerobic metabolism have emerged from studies on bacteria that degrade soluble aromatic substrates to CO2, in the complete absence of molecular oxygen. Under anaerobic conditions, the reductive attack on the aromatic ring requires central intermediates that are quite different from those of the aerobic pathways (the anaerobic pathways use a reductive biochemistry, including other reactions such as carboxylations, reductive dehydroxylations, addition reactions etc., all absent in aerobic. The most common central intermediate in anaerobic aromatic metabolism is benzoyl-CoA. The key enzyme involved in the reaction is benzoyl-CoA reductase. The product of benzoyl-CoA reduction, cyclohex-1, 5-diene-1-carboxyl-CoA, is oxidized so that 1 molecule produces 3 molecules of acetyl-CoA and 1 of CO_2 in a sequence of reactions that are analogous to P-oxidation.

Fig. 5.9.1-5: The anaerobic reaction of benzoyl-CoA The hydrogen atoms incorporated into the compounds are highlighted (bold).



Validation of the analytical method
Review article, no experiments performed

III. CONCLUSIONS
Under anaerobic conditions, the reductive attack on the aromatic ring requires central intermediates that are quite different from those of the aerobic pathways. The most common central intermediate in anaerobic aromatic metabolism is benzoyl-CoA. The key enzyme involved in the reaction is benzoyl-CoA reductase. The product of benzoyl-CoA reduction, cyclohex-1, 5-diene-1-carboxyl-CoA, is oxidized so that 1 molecule produces 3 molecules of acetyl-CoA and 1 of CO_2. The ring structure is opened hydrolytically.

Comments of zRMS:	Not considered relevant for this assessment.

KIIA-7.2.1 Federle (1988)

2.	**Ref. Point:**	**KIIA-7.2.1/04, Rate of degradation in soil**
3.	**Authors:**	Federle, T. W. (1988)
	Title	Mineralization of monosubstituted aromatic compounds in unsaturated and saturated subsurface soils, Canadian journal of microbiology. 34(9), 1037-1042
	Test facility, Report-No.:	- -
	Owner:	-
	Report date:	1988
4.	**Test facility:**	-
5.	**Dates of experimental work:**	-
6.	**Test substance:**	[ring- ^{14}C(U)]Benzoic acid (specific activity, 10.6 mCi/mmol (I Ci = 37 GBq)) was purchased from California Bionuclear Corporation (Sun Valley, CA) with a purity of 98%.
7.	**Guideline / Test method:**	No guideline followed
	Deviations:	-
8.	**GLP:**	No

Executive Summary

The mineralization of Benzoic acid, phenol and benzylamine was determined as a function of depth in two 20-m sandy soil profiles, one of which was adjacent to a leach field receiving wastewater from a laundromat. Soil samples were collected aseptically, adjusted to 20-25% water content and amended with a trace level (50 ng/g soil) of the ^{14}C-ring-labeled compounds. Evolution of $C0_2$ was followed with time. First-order rate constants and the extents of mineralization were estimated from the resulting data by nonlinear regression. All three compounds were mineralized in every sample examined without a lag period. In general, phenol was mineralized more rapidly than Benzoic acid, which was more rapidly mineralized than benzylamine. Benzylamine had the highest sorption coefficient; phenol had the lowest. Average half-life was 0.56 days for phenol, 0.84 days for Benzoic acid, and 1.31 days for benzylamine. Mineralization rates did not correlate with bacterial number, fluorescein diacetate hydrolysis rate, or any soil characteristic. The ultimate percentage of all three compounds mineralized was lowest in the upper 3 m of both soil profiles. The total amounts of phenol and Benzoic acid mineralized negatively correlated with cation-exchange capacity and silt content. Statistical analysis (2-level nested ANOVA) revealed that only the rate of phenol mineralization varied significantly as a function of soil profile, but rates for all three compounds varied significantly as a function of depth within a profile.

Table 7.2.1-1: First-order rate constants for Benzoic acid in control soil

Soil	Kinetic Model	Alternative denomination	Benzoic acid
		Soil	k
Control, depth = 0.5 m, 24°C*	SFO	I	1.09

In conclusion, Benzoic acid rapidly degraded in soil.

I. MATERIALS AND METHODS

A. MATERIALS

Test Material: [ring- ^{14}C(U)]Benzoic acid (specific activity, 10.6 mCi/mmol (I Ci = 37 GBq)) was purchased from California Bionuclear Corporation (Sun Valley, CA) with a purity of 98%; 750 ng

CAS n°: 65-85-0

Description: Solid

Lot/Batch#: Not stated

Purity: Purity 98 %

Solvent used: Sterile Water

Table 7.2.1-2: Characteristics of control soil (data taken from Fig. 7.2.1-1)

Parameters	Soil	
	I	II
	Control*	Leach Field*
Site location:	Central Wisconsin, near Summit Lake (not influenced by wastewater)	Central Wisconsin, near Summit Lake (site influenced by wastewater [*and therefore not considered for further evaluation]*)
Batch:	No data	
Soil characteristics:		
- pH (0.01 M $CaCl_2$)	6.2 – 7.7	
- Organic carbon (g/100 g soil) %	0.1	
- Nitrogen content %	Ammonia levels were 37-49 mg/kg dry wt. soil (0.0037 – 0.0049%)	
- Cation exchange capacity (mequiv./100 g soil)	7.5	
- C/N Ratio **	< 20.5	
- Organic matter % **	0.17	
Soil type (according to USDA [3]):	loamy sand above 2m, sand below 2m	
Particle size analyses (mm):		

Parameters	Soil	
	I	II
	Control*	Leach Field*
Site location:	Central Wisconsin, near Summit Lake (not influenced by wastewater)	Central Wisconsin, near Summit Lake (site influenced by wastewater [*and therefore not considered for further evaluation]*)
< 0.002 (clay) %	< 48	
0.002-0.05 (silt) %	< 48	
> 0.05 (sand) %	No data	
Water Holding Capacity (WHC) (g water/100g soil)		
at pF 1.0	No data	
at pF 2.0	No data	
at pF 2.5	No data	
Biomass (mg microbial carbon/100 g dry soil)	No data	
Start / End of Incubation	Sample collection after 0. 17 , 0.33, 1, 2,4, 8, 16, 32, and 64 days	

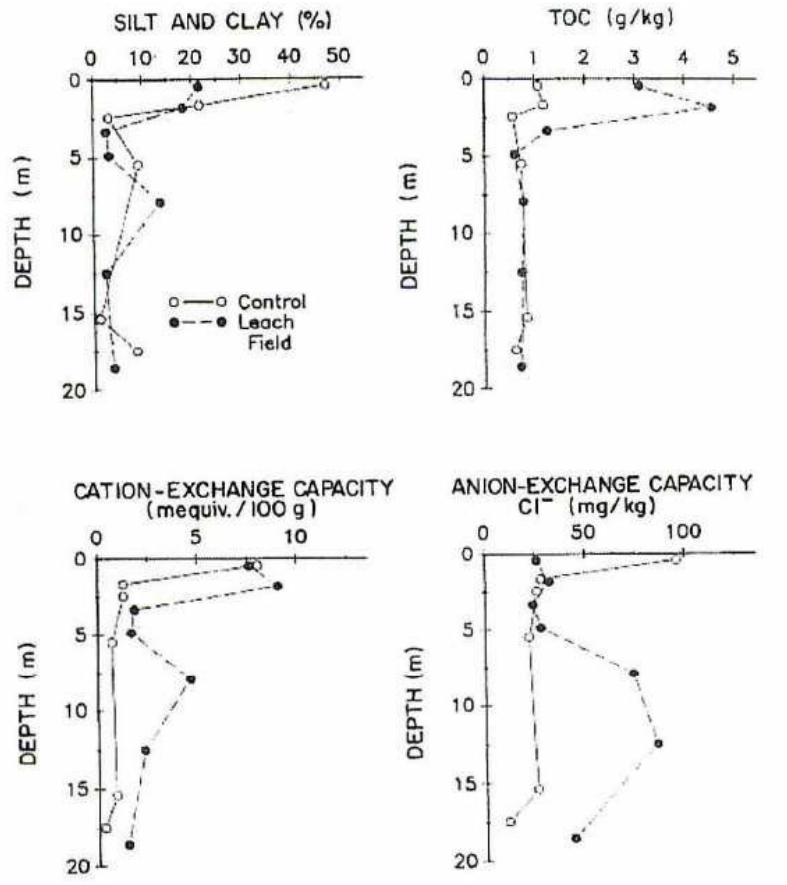
* Physical chemical characteristics of the soil were determined using standard procedures (U.S. Soil Conservation Service 1972).

** %OM and C/N ratio was calculated as follows:

%OM = 1.724 • % organic carbon

C/N ratio = % organic carbon / % nitrogen content

Fig. 7.2.1-1 Physicochemical characteristics of subsurface soil as a function of depth in profiles from Northern Wisconsin. TOC = total organic carbon



B. STUDY DESIGN

1. Experimental conditions:

Soil cores wa obtained from two sites in north central Wisconsin, near the town of Summit Lake. The control core was drilled in an area not influenced by wastewater. Aseptic samples were obtained at various depth. Soil texture was loamy sand above 2 m and sand below this depth. The depth of the water table was approximately 14 m. Ammonia levels were 37-49 mg/kg dry wt. soil, and phosphorus concentration ranged from 330 to 1230 mg/kg dry wt. soil. These levels showed no apparent relationship with depth or site. The pH varied from 6.2 to 7.7, likewise, in no systematic manner.

For mineralization assays: Soil (15 g) was aseptically transferred into triplicate serum bottles (60 mL) and adjusted to 20-25% moisture content with sterile water containing approximately 750 ng of radiolabeled test compound. The soil was mixed with a sterile applicator stick, and the bottles were sealed with rubber

stoppers equipped with plastic wells containing a fluted filter paper soaked with 0.2 mL of 1.5 M KOH to trap the evolved $^{14}CO2$. The bottles were incubated under static conditions at 24°C.

2. Sampling

Periodically, the filter papers were removed and replaced with fresh filters. Typically, filters were exchanged after 0.17.0.33, 1, 2, 4, 8, 16, 32, and 64 days.

3. Description of analytical procedures:

The recovered filters were placed in scintillation vials with RPI Scintillator, and radioactivity was determined by LSC (= liquid scintillation counting). At the termination of the incubations, residual $^{14}CO2$ was recovered by acidifying the samples with 6 M HCl. Data were expressed as cumulative percentage of the radiolabeled chemicals recovered as $^{14}CO2$. The data were corrected utilizing abiotic controls, amended with 1% formalin. At the end of the incubation period, the radioactivity in samples from three representative depths in the leach-field profile was further fractionated. The samples were washed with 25 mL water and centrifuged (10 000 x g; 10 min). The supernatants were recovered, and radioactivity in an aliquot was quantified by LSC. The soil was next extracted with 25 mL of 10% (w/v) trichloroacetic-acid solutions for 12 h at 4°C. The samples were centrifuged, and radioactivity in the supernatant was determined as before. A sample (1 g) of the remaining soil was combusted, and radioactivity measured as described above.

II. RESULTS AND DISCUSSION

A. Rate of degradation of Benzoic acid

Benzoic acid was mineralized without a lag period at every depth. The mineralization rate for Benzoic acid ranged from 0.22 to 1.6 d^{-1} and averaged 0.82 d^{-1}. Mean half-live for Benzoic acid was 0.84 days (ranging from 0.4 to 3.2 days) ***[No differentiation was made between control and leach field, please see reviewer's comment beneath].***

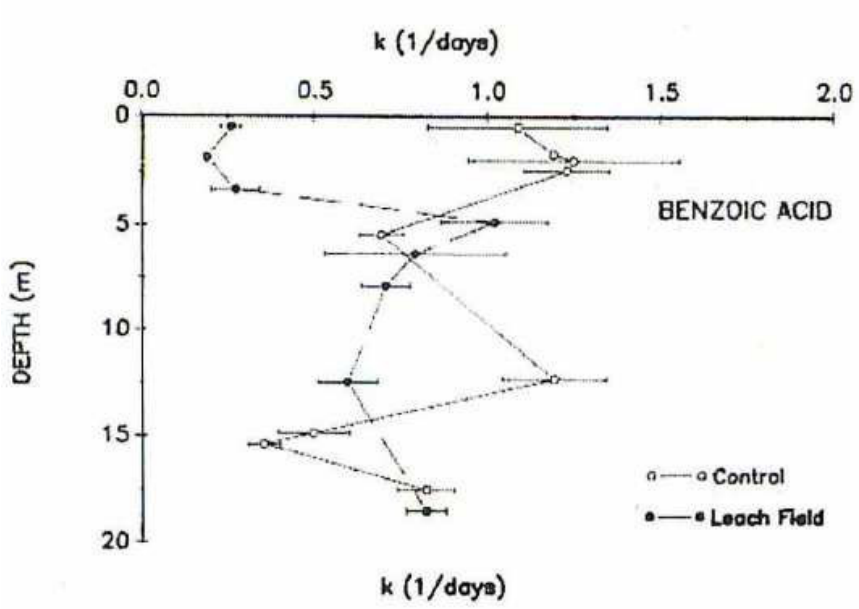
Mineralization rates did not vary in any systematic way with depth, nor did they correlate with bacterial number, FDA (fluorescein diacetate) hydrolysis activity, one another, or with any edaphic factor. Benzoic acid mineralization was not consistently more or less rapid. Recoveries of Benzoic acid ranged from 28-53%. The extent of mineralization was generally lower in the upper 3m of the profile. The extent of Benzoic acid mineralization also correlated negatively with cation-exchange capacity ($r = -0.74$; $p \leq 0.01$) and silt content ($r = -0.59$; $p \leq 0.05$), but positively with pH ($r = 0.84$; $p \leq 0.01$).

The rates of mineralization were analyzed using a 2-level nested analysis of variance to examine variation between profiles, among depths within a profile, and among samples at a depth. Based on this model, the variation as function of profile was insignificant for Benzoic acid, while variation as a function of depth within a profile was significant. Variance components were computed. Variance components, when expressed as a percentage of the total variation, give an indication of variation at various levels in the experimental design. Majority of variation was localized among different depths within a profile.
Table 7.2.1-3 summarizes the degradation rates of Benzoic acid in control soil.

Table 7.2.1-3: Degradation rate of Benzoic acid in control soil (data taken from Fig. 7.2.1-2)

Soil	Kinetic Model	Soil I	Benzoic acid
		Depth (m)	k (1/days), 24°C
Control	SFO	0.5	1.09
		1.8	1.18
		2.1	1.24
		2.6	1.21
		5.6	0.69
		12.3	1.18
		14.9	0.50
		15.4	0.36
		17.4	0.82

Fig. 7.2.1-2 First-order rate constants (*k*) and extents of mineralization describing Benzoic acid mineralization as a function of depth in soil profiles from Northern Wisconsin (means ± standard deviations; n=3)



B. Validation of the analytical method

In mineralization experiments, 28% - 53% of Benzoic acid was recovered as $^{14}CO_2$. At the termination of the incubations, the radioactivity remaining in the test systems was fractionated. Representative samples from three depths in the soil profile were examined. In live samples, 88 to 98 % of residual radioactivity was not extractable with water. In the abiotic controls, the percentage was 61.8 to 95.1 %. Total recoveries of radioactivity from the test system after incubation were between 74 to 79% for Benzoic acid.

III. CONCLUSIONS

A high proportion of humic materials consists of aromatic moieties. As a consequence, microbes in the subsurface should be preadapted for utilization of aromatic substrates. It, therefore, was not surprising that Benzoic acid which is relatively labile, was rapidly mineralized without a lag in every sample examined. In the present study, mineralization rates did not correlate with either biomass or activity.

Reviewers comment on KIIA-7.2.1/04:

The author only described a half-life rate of 0.84 days for both soils together (control and leach field). However, the leach field had received wastewater from a Laundromat and thus was not suitable for the evaluation of representative DT_{50} value. Thus rate constants reported for control soil cores (extracted from Fig. 7.2.1-2) were used to calculate DT_{50} values ($DT50 = \ln(2)/k$).

Calculated DT_{50} and DT_{90} values for Benzoic acid in control soil are presented in Table 7.2.1-4.

Table 7.2.1-4: Calculated DT_{50} / DT_{90} values for Benzoic acid

Soil	Kinetic Model	Soil I,	Benzoic acid			
		Depth (m)	*k* (1/days), 24°C	DT_{50} (d), 24°C	DT_{50} (d), normalized to 20°C*	DT_{90} (d), normalized to 20°C**
Control	SFO	0.5	1.09	0.64	0.9	3
		1.8	1.18	0.59	0.9	3
		2.1	1.24	0.56	0.8	2.7
		2.6	1.21	0.57	0.8	2.7
		5.6	0.69	1.00	1.5	5
		12.3	1.18	0.59	0.9	3
		14.9	0.50	1.39	2.0	6.6
		15.4	0.36	1.93	2.8	9.3
		17.4	0.82	0.85	1.2	4

* DT_{50} values were normalized to a temperature of 20°C with Input decision sheet No 3.3 (revision of 31.07.2012), published by Federal Environment Agency (UBA), Germany, Q10-value = 2.58

** DT_{90} value was calculated from $DT5_0$ by the following equation: DT_{50} x 3.33 in consideration of SFO

Normalized DT_{50} (to 20°C) in the upper layer of the control soil was 0.9 days. This value covers all DT_{50} values that were calculated based on other reports. Since this is the worst-case DT_{50} value, it was used for the calculation of predicted environmental concentrations (PEC) in different environmental compartments.

Comments of zRMS:	Acceptable. Within the article other degradation rates from open literature are cited which are in a similar range. Adsorption experiments were also conducted in the study. The Kd value obtained for the 0.4 m depth and control site was 1.55. A reasonable Koc can't be determined due to the low organic carbon contend (0.1 %).

KIIA-7.4.1 von Oepen (1991)

2.	**Ref. Point:**	**KIIA-7.4.1/07, Mobility in soil**
3.	**Authors:**	B. von Oepen, W. Koerdel and W. Klein (1991)
	Title	Sorption of Nonpolar and Polar Compounds to Soils: Processes, Measurements and Experience with the Applicability of the Modified OECD-Guideline 106, Chemosphere, Vol. 22, Nos 3-4, pp. 285- 304
	Test facility, Report-No.:	- -
	Owner:	-
	Report date:	1991
4.	**Test facility:**	-
5.	**Dates of experimental work:**	-
6.	**Test substance:**	Benzoic acid
7.	**Guideline / Test method:**	OECD-Guideline 106 (modified)
	Deviations:	-
8.	**GLP:**	No

Executive Summary

The purpose of this study was to analyse the sorption of four chemical classes of chemicals by three representative soils varying in their sorption-relevant properties, e.g. organic carbon content, clay content, pH value, Cation Exchange Capacity etc. The sorption coefficients of 50 organic compounds of different polarity, including carboxylic acids, and corresponding ester, amines and amides were determined by batch equilibrium studies according to a modified version of the OECD-Guideline 106 Adsorption/Desorption. The mechanisms contributing to the sorption of organic chemicals to soils are summarized, and the use of koc as a generally applicable parameter is discussed.

Table 7.4.1-01: Summary of sorption coefficients of Benzoic acid

Soil	k_f	koc	r	1/n
Podzol	3.56	73	1.00	0.90
Alfisol	0.23	18	0.90	

I. MATERIALS AND METHODS

A. MATERIALS

Test Material:	Benzoic acid
CAS n°:	-
Description:	-
Lot/Batch#:	-
Purity:	-
Solvent used:	-

Table 7.4.1-02: Characteristics of control soil (data taken from Fig. 7.2.1-1)

Parameters	Soil		
	I	II	III
	Podzol*	Alfisol (agricultural soil)*	Sediment
Site location:	Germany	Germany	Lake Constance
Batch:	-	-	-
Soil characteristics:			
- pH (0.01 M $CaCl_2$)	2.8	6.7	7.1
- Organic carbon (g/100 g soil) %	4.85	1.25	1.58
- Nitrogen content %	-		
- Cation exchange capacity (mequiv./100 g soil)	15.1	12.3	13.4
- C/N Ratio **	-	-	-
- Organic matter % **	8.36	2.16	2.72
Soil type (according to USDA [3]):	Podzol	Alfisol	-
Particle size analyses (mm):			
< 0.002 (clay) %	2.6	15.9	35.7
0.002-0.05 (silt) %	8.2	14.4	58.8
> 0.05 (sand) %	89.2	69.7	5.5
Water Holding Capacity (WHC) (g water/100g soil)	-	-	-
Biomass (mg microbial carbon/100 g dry soil)	-	-	-
Start / End of Incubation	-		

* Physical chemical characteristics of the soil were determined using standard procedures (U.S. Soil Conservation Service 1972).

** %OM and C/N ratio was calculated as follows:
%OM = 1.724 • % organic carbon
C/N ratio = % organic carbon / % nitrogen content

B. STUDY DESIGN

1. Experimental conditions:

According to a modified version of the OECD-Guideline 106, the sorption capacity of three different soils, was investigated by batch equilibrium studies frequently carried out for the determination of adsorption coefficients is the analysis of a defined soil/solution ratio using at least four initial concentrations of the substances studied. The suspensions are shaken until the equilibrium is reached and

the concentration of the compound is analysed in the liquid phase. A $CaCl_2$-solution is used as aqueous phase to simulate the ion strength of soil solution and to improve the separation during centrifugation.

The distribution coefficient is described as: **kd= x/m / Ce (Equation 1)**

With kd: distribution coefficient; x/m: concentration in the soil at equilibrium state [µg/ml]; Ce: concentration in the solution at equilibrium state µg/ml]

Sorption coefficients independent of the concentration are obtained by fitting the Freundlich equation:
kf = x/m / Ce $^{1/n}$ (Equation 2)

With kf: Freundlich adsorption constant; 1/n = compound dependent constant (mostly between 0.7 and 1.2)

The soil sorption coefficient (koc) is defined as the distribution coefficient (ka or kf) of a compound adsorbed to the soil devided by the organic carbon content of the soil (% oc).
koc = kf*100 / %oc (Equation 3)

2. Sampling

The soils used for testing were selected under support of Prof. Fränzle and Brümmer considering representativity for the FRG and covering a broad spectrum of sorption relevant properties e.g. organic carbon content (% oc), clay content, pH value, Cation Exchange Capacity etc.. The soils used for testing were an acidic forest soil [not considered in this summary], a Podzol and an agricultural soil (Alfisol). Additionally the sorption behaviour of a sublimnic soil, a sediment of the Lake Constance, was investigated.

3. Description of analytical procedures:

The sorption coefficients were determined according to the test sequence of the modified version of the OECD-Guidcline 106. The steps of the test-sequence were completely performed without considering the criteria for stopping the test-sequence. The mass balance was determined, when the substance showed a desorption of less than 75 %. The preparation of the soils for testing, e.g. homogenization, sterilization etc., in order to obtain reproducible findings was described in an earlier publication (von Oepen et al. 1989 [4]). 50 ml of the test solution were added to 10 g (dry weight) of the specific soils. The soil samples were shaken for 0.5, 1, 1.5, 5, 24 respectively 72 hours. Then an aliquot of 1 ml of the water-phase was removed and the concentration of the substance in the aqueous phase was determined. As for all investigated substances the sorption equilibrium was reached within 16 hours, the Freundlich

[4] Oepen, B. von, Kördel, W., Klein, W. (1989), Soil Preparation for the estimation of adsorption coefficents (koc) of organic chemicals, Chemosphere 18, 1495-1511; **Preparation of the soil according to this reference**: The soil was air dried over several days and then sieved to obtain the < 2mm fraction. The dry weight of the soil was determined. According to DIN 19683 the particle size determination of the soil was carried out. For decreasing the scattering of the sorption coefficients the soil was divided into the following subfractions: 0.63-2mm, 0.20-0.63mm, 0.063-0.2mm, < 0.063 mm. These subfractions were combined for testing according to their dry-weight content. All tests were carried out in centrifuge tubes (10 x 4.0 cm). For equilibration 10 g of the dry soil were suspended in 25 ml 0.01 mol $CaCl_2$-solution. After 5 hours the samples were autoclaved for 20 minutes (121 ° C,1.3 bar). After 16 hours the samples were cooled down and the test solution was added

isotherms were determined after an incubation period of 16 hours. The initial concentrations used were about 15 mg/l, 5 mg/1, 0.5 and 0.15 mg/l. After reaching the equilibrium the soil samples were centrifuged, decanted, and the concentrations in the supernatant were determined by means of GC, HPLC or szintillation measurements (von Oepen 1990 [5]). All samples were determined in parallel. One control and one blank were investigated additionally. Alter the adsorption step a two step desorption test was performed with an equilibrium time of 8 hours followed by a desorption period of 16 hours. When necessary, the mass balance was determined, using a mixture of Acetonitrile/0.01M $CaCl_2$/ Acetic-Acid (80/18/2). The Freundlich constants and koc values were calculated according to equations for the distribution coefficient (kd = (x/m)/Ce), the Freundlich adsorption constant (kf = (x/m)/Ce1/n) and the soil sorption coefficient (koc = kf*100/%oc).

II. RESULTS AND DISCUSSION

For all tested substances the sorption equilibrium was reached within 16 hours. The desorption data revealed that sorption was reversible to a great extent for all substances under study. The mass balance resulted in a recovery > 80 %. The calculated Kf and koc values and the corresponding regression coefficients and slopes of Freundlich-isotherms are presented in the table below. Routinely the Freundlich-equation was calculated on the basis of 4 concentrations. The correlation coefficients obtained are highly significant.

Table 7.4.1-03: Summary of sorption coefficients

Soil	k_f	koc	r	1/n
Podzol	3.56	73	1.00	0.90
Alfisol	0.23	18	0.90	

The soil with the highest organic carbon content, the Podzol, has the highest sorption capacity towards all substances under study. Consequently the sorption coefficients determined tbr Alfisol and the sediment are lower than those determined for the Podzol. However the variation in koc values is up to two orders of magnitude.

III. CONCLUSIONS

The results of this study show that batch-equilibrium studies are appropriate to determine sorption coefficients. The test-sequence of the modified version of OECD-Guideline 106 proved to be well applicable for all the tests. A koc value of 18 was determined for Benzoic acid in agricultural soil.

Von Oepen et al. (1991)

Reviewers comment on KIIA-7.4.1/07:

Sorption behaviour of Benzoic acid was determined in agricultural soil according to a modified protocol of OECD guideline 106. The calculated KOC value of 18 was used as endpoint for the active substance.

Comments of zRMS:	acceptable, the KOC of 18 can be used for modelling

[5] Oepen, B. von (1990), Sorption organischer Chemikalien an B6den, Dissertation, Universität Duisburg, Verlag Maraun.

KIIA-7.8.1 Kawamura & Kaplan (1990)

2.	**Ref. Point:**	**KIIA-7.8.1/01, Degradation in aquatic systems**
3.	Authors:	Kawamura, K., & Kaplan, I. R. (1990)
	Title	Stabilities of carboxylic acids and phenols in Los Angeles rainwaters during storage, Water Research. 24(11), 1419-1423
		-
	Test facility, Report-No.:	-
	Owner:	-
	Report date:	1990
4.	**Test facility:**	-
5.	**Dates of experimental work:**	1982-1983
6.	**Test substance:**	Benzoic acid
7.	**Guideline / Test method:**	No guideline followed
	Deviations:	-
8.	**GLP:**	No

Executive Summary

Concentration changes of acidic organic compounds (volatile aliphatic acids, fatty acids, aromatic acids and phenols) in rainwaters collected in Los Angeles, Calif., were studied during storage experiments (up to 45 days). Carboxylic acids decreased with time in the order: Benzoic acid < fatty acids < volatile acids. Although the observed losses have not been shown to result from microbial degradation, such a process is highly likely. Degradation of these acids, especially formic and acetic acids which are major components may result in a pH increase, during storage of rain. By contrast, toluic acids and phenols did not show a decrease in concentration even after 2 weeks storage (Findings are summarized in table above).

I. MATERIALS AND METHODS

A. MATERIALS

Test Material:	Benzoic acid
CAS n°:	-
Description:	-
Lot/Batch#:	-
Purity:	-
Solvent used:	-

B. STUDY DESIGN

1. Experimental conditions:

Storage experiments were conducted using fresh rain samples. Prior to the experiment, rainwater samples were not inoculated with bacteria or other microorganisms; however, rainwater contains microorganisms which are scavenged from the atmosphere and possibly wind blown dust.

2. Sampling

Two rain samples (26 March 1982 and 17-18 April 1983) were used in this study. Both samples were collected on the roof of the Geology Building at the UCLA campus in Los Angeles, Calif., using metallic rain collectors. No poison was added to the rainwater during sample collection.

Experiment 1: The storage experiment of 26 March 1982 rain (ca. 9 L) was started immediately after sample collection in a 20 L clear glass bottle with an aluminum foil cap at 22°C.

Experiment 2: The storage experiment of 17-18 April 1983 rain (ca. 3L) was conducted in a 4 L brown glass bottle at 22°C. A Teflon-lined cap was used to avoid loss of volatile acids from the bottle.

3. Description of analytical procedures:

Experiment 1: About a 1 liter aliquot of sample was taken from the 20 L bottle at the times of 0, 0.5, 1, 2, 3, 6 and 14 days, after vigorous shaking of the bottle. The bottle was shaken by hand every day to supply air to the rainwater. The collected aliquot was acidified to pH 1 with HCL (which was pre-extracted with CH_2CI_2) and then analyzed for aliphatic acids, aromatic acids and phenols by a method of Kawamura and Kaplan (1986[6]). Briefly, the sample was extracted in a separatory funnel with CH2Cl2 using a continuous steam distillation-extraction apparatus. The extracts were combined and the acidic components (carboxylic acids and phenols) were separated into 1 M KOH solution. They were back-extracted into the CH_2Cl_2 layer after acidifying the alkaline solution. The acidic fraction was then methylated with 14% BF3 in methanol. The methylated fraction (methyl esters and phenols) were analyzed with a Hewlett-Packard Model 5840 gas chromatograph (GC) equipped with a fused silica DB-5 capillary column and an FID detector.

Experiment 2: About 100 ml of rain were taken in a 200 ml brown glass bottle with a Teflon-lined cap at the times of 0, 2, 7 and 45 days. The samples were poisoned with HgCl2 and stored in a freezer prior to analysis. These samples were analyzed only for low molecular weight monocarboxylic acids (C1-C9). Fifty ml of rain were pH-adjusted to 8.0-8.5 with 1 M KOH solution and concentrated to c. 2 ml by rotary evaporation under vacuum. The sample was passed through a cation exchange resin column to convert the acid to potassium carboxylate (RCOO-K+) form. The carboxylates were then derivatized to p-bromophenacyl esters with α.p-dibromoacetophenone and a crown ether (catalyst). The phenacyl esters were cleaned on SiO2 column and were determined by capillary GC. Details of volatile acid

[6] Kawamura K. and Kaplan I. R. (1986) Biogenic and anthropogenic organic compounds in rain and snow collected in southern California. Atmos. Envir. 20, 115-124.

analysis are presented elsewhere (Kawamura and Kaplan, 1984[7]) .

Identification of GC peaks was performed by comparison of GC retention times with those of authentic standards. The compounds reported here are also identified by GC-MS analyses.

II. RESULTS AND DISCUSSION

Benzoic acid was detected in the rainwater samples. Total concentration of the acids in the fresh rain sample was 180µg/l. Aromatic acids, dominated by Benzoic acid, are major extractable acidic components (8.6 µg/l). In the 17-18 April 1983 rain sample, the concentration of Benzoic acid did not change for the first 2 days, but slightly decreased in 7 days (60% remained). After 45 days, Benzoic acid was not detected. A similar trend was observed for the 26 March 1982 rain sample, although the concentration of Benzoic acid decreased by 22% in 6 days. Microbiological tests were not performed, but it is very likely that microbial degradation resulted in the compositional changes.

Although the concentration of Benzoic acid was almost unchanged within 2 days of storage during which time span aliphatic C1 - C9 acids disappeared, it decreased at the end of the storage experiment. These Findings indicate that Benzoic acid is not stable in stored rainwater, although it is more resistant to decomposition than volatile aliphatic acids. The difference in the degradation patterns of aliphatic C1 - C9 acids and aromatic (Benzoic) acid, may be due to a time lag for the appearance of appropriate bacteria to metabolize Benzoic acid, or due to some preferential degradation of aliphatic acids over aromatic acid.

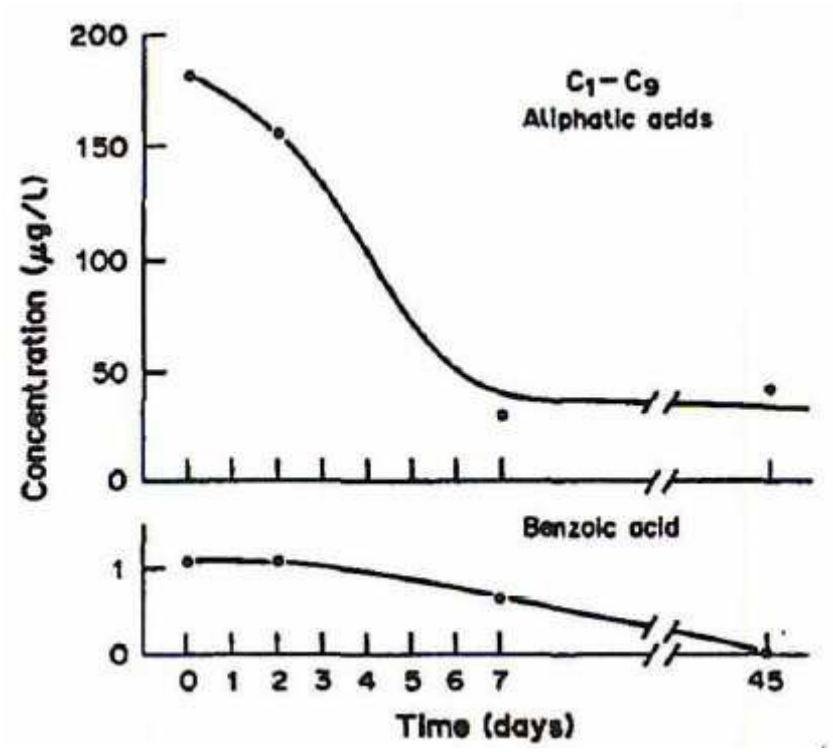


Fig. 7.8.1-01 Changes in the concentrations of C_1-C_9, aliphatic acids and Benzoic acid during the storage experiment of the 17-18 April 1983 rainwater.

[7] Kawamura K. and Kaplan I. R. (1984) Capillary gas chromatography determination of volatile organic acids in rain and fog samples. Analyt. Chem. 56, 1616-1620.

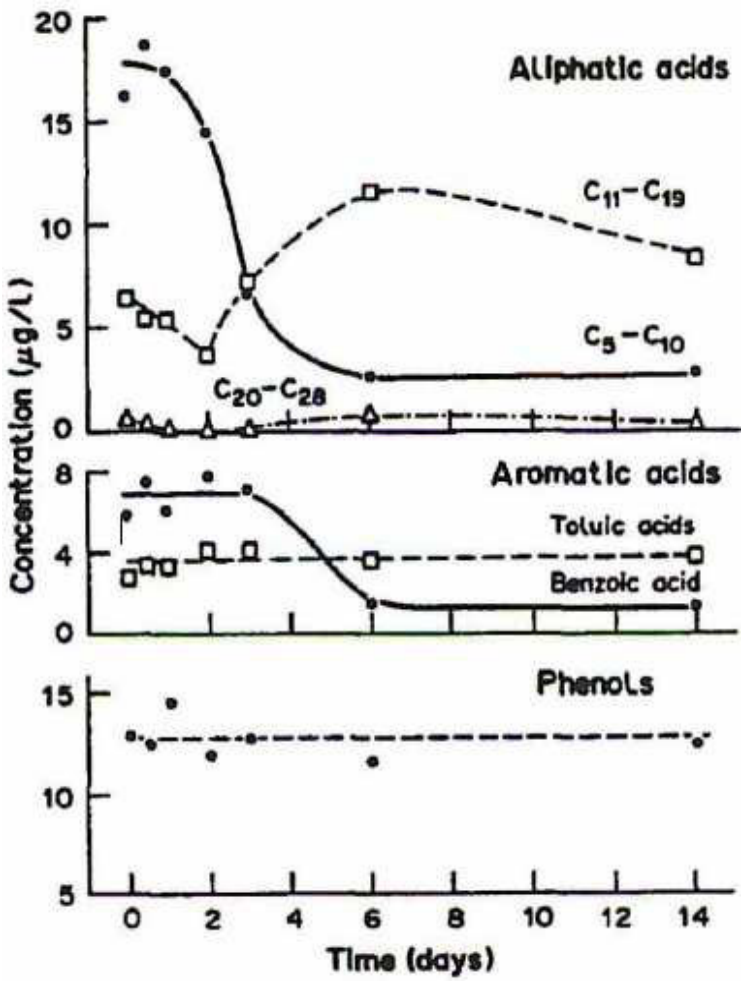


Fig. 7.8.1-02 Changes in the concentrations of aliphatic acids, aromatic acids and phenols during the storage experiment of the 26 March 1982 rainwater.

Selective degradation of organic compound classes was apparently observed in the course of incubation experiments of rainwater. The stability of organic compounds increases in the following order: volatile acids < fatty acids < Benzoic acid < toluic acids = phenols

III. CONCLUSIONS

The study showed that selective degradation of polar organic compounds occurs during storage of urban rainwater at room temperature. Degradation rates appear to increase in the order: Benzoic acid < fatty acids < volatile acids.

Kawamura, K. & Kaplan, I. R. (1990)

Reviewers comment on KIIA-7.8.1/01:

For Benzoic acid the half-life rate (based on Kawamura & Kaplan 1990) has been calculated by the reviewer using MODELMAKER (vers. 4.0) taken into account first order kinetics. The rate constant was K = 0.1829 (± 0.00018) and the **DT_{50} = 3.8 days**. The table below summarizes model data:

Table 7.8.1-01 Overview on model data (MODELMAKER)

	Mean	standard dev.	t-value	p	DT_{50}	DT_{90}
d1	144.22	0.08	1718.54	0.0000		
K1	0.1829200	0.000182325	1003.26	0.0000	3.8	12.6

The DT_{50} of 3.8 days was used for risk assessments.

Comments of zRMS:	The study was performed in rainwater, the data cannot be used as repreeentative for water-sediment studies. Nevertheless, the study indicates a fast decline of benzoic acid in an aquatic environment, even in rainwater, where the concentration of microorganisms is assumed to be low.

KIIIA1 9 Fate and Behaviour in the Environment – Plant protection product

KIIIA1 9.6.1. Becker, E.-M. (2013a)

Dossier No.:	**KIIIA1-9.6.1/01**
Title:	Becker, E.-M. (2013), MENNO Florades: Predicted environmental concentrations (PEC) of Benzoic acid in groundwater using FOCUS PELMO 5.5.3 for application in cereals DHD-Consulting GmbH, Germany
Document No.	MEN-2013-04
Report date	13 June 2013
Guidelines	SANCO/321/2000 rev. 2 – Focus groundwater scenarios in the EU review of active substances; Generic guidance for Tier 1 FOCUS groundwater assessments, vers. 2.0 (01.2011)
GLP	No

The predicted environmental concentration in groundwater (PEC_{GW}) was calculated for the application of Benzoic acid for 26 years using FOCUS PELMO 5.5.3. Calculations were performed for all locations[8] collectively representing agriculture in Europe. Winter cereals were chosen as crop scenario, because it covers all locations. Since there is no fixed application time point for MENNO Florades, two representative application time points in spring and autumn were selected for PEC_{GW} calculation.

[8] Châteaudun (C), Hamburg (H), Jokioinen (J), Kremsmünster (K), Okehampton (N), Piacenza (P), Porto (O), Sevilla (S), Thiva (T)

- Calculations were performed with the worst case application rate of 28800 g a.i./ha.

Further application information is given in Table 9.6.1-1. Table 9.6.1-2 lists the physico-chemical properties and the soil degradation value used for the calculations.

Table 9.6.1-1: Application information

Active ingredient	Benzoic acid
Crop scenario	Cereals (winter)
Locations	Châteaudun (C), Hamburg (H), Jokioinen (J), Kremsmünster (K), Okehampton (N), Piacenza (P), Porto (O), Sevilla (S), Thiva (T)
Number of applications	1
Timing of Application	15 March 15 September
Single application rate [g a.i./ha]	28800
Crop interception [%]	0

Table 9.6.1-2: Properties of the active substance

Parameter	Benzoic acid
Molecular mass [g/mol]	122.12
Henry's constant [Pa m^3 mol^{-1}]	0.0133
Vapour pressure [Pa]	0.055
K_{OC} [mL/g]	18
K_{OM} [mL/g]	10.44
Freundlich sorption exponent (1/n)	1
pH-dependence	no
DT_{50} [days] (laboratory studies)	0.9 days
Plant uptake factor	0
Q10	2.58

Table 9.6.1-3 and following summarise the results of the FOCUS PELMO calculations for MENNO Florades and its active ingredient Benzoic acid in winter cereals.

Table 9.6.1-3: Leaching concentrations of Benzoic acid after application in winter cereals

FOCUS PELMO 5.5.3 for application in cereals	
Date: 15 March, application rate 28800 g a.i./ha	
Location	Annual concentration in groundwater [µg a.i./L] (80th %ile value in the percolate at 1 m soil depth)
Châteaudun (C)	0.000
Hamburg (H)	0.004
Jokioinen (J)	0.003
Kremsmünster (K)	0.001
Okehampton (N)	0.039
Piacenza (P)	0.001
Porto (O)	0.001
Sevilla (S)	0.000
Thiva (T)	0.000

FOCUS PELMO 5.5.3 for application in cereals	
Date: 15 September, application rate 28800 g a.i./ha	
Location	Annual concentration in groundwater [µg a.i./L] (80th %ile value in the percolate at 1 m soil depth)
Châteaudun (C)	0.000
Hamburg (H)	0.000
Jokioinen (J)	0.014
Kremsmünster (K)	0.000
Okehampton (N)	0.000
Piacenza (P)	0.000
Porto (O)	0.000
Sevilla (S)	0.000
Thiva (T)	0.000

IIIA 9 Conclusion

The predicted environmental concentrations in groundwater (PEC_{GW}) were calculated for the application of Benzoic acid for 26 years using FOCUS PELMO 5.5.3. Calculations were performed for a rate reaching soil of 28800 g a.i./ha, for 9 representative locations and two time-points. In each case, calculated PEC_{GW} values were below 0.1 µg/L. FOCUS PELMO 5.5.3 calculations for Benzoic acid demonstrate that no unacceptable leaching of Benzoic acid into groundwater is to be expected from the intended GAP-use of this product.

Becker, E.-M. (2013)

zRMS Comments:	The applicant provided a worst case simulation with the unlikely assumption that the applied desinfactant will leach totally into the soil via cracks. The zRMS agrees with the input parameters used. Even with this assumption, no concentrations >0.1 µg/L are ecpected according to modelling.
zRMS Conclusions:	No contamination of the ground water in concentrations >0.1 µg/L are ecpected.

KIIIA1 9.6.1. Becker, E.-M. (2013b)

Dossier No.:	**KIIIA1-9.6.1/02**
Title:	Becker, E.-M. (2013), MENNO Florades: Predicted environmental concentrations (PEC) of Benzoic acid in groundwater using FOCUS PEARL 4.4.4 for application in cereals DHD-Consulting GmbH, Germany
Document No.	MEN-2013-03
Report date	13 June 2013
Guidelines	SANCO/321/2000 rev. 2 – Focus groundwater scenarios in the EU review of active substances; Generic guidance for Tier 1 FOCUS groundwater assessments, vers. 2.0 (01.2011)
GLP	No

The predicted environmental concentration in groundwater (PEC_{GW}) was calculated for the application of Benzoic acid for 26 years using FOCUS PEARL 4.4.4. Calculations were performed for all locations[9] collectively representing agriculture in Europe. Winter cereals were chosen as crop scenario, because it covers all locations. Since there is no fixed application time point for MENNO Florades, two representative application time points in spring and autumn were selected for PEC_{GW} calculation.

- Calculations were performed with the worst case application rate of 28800 g a.i./ha.

Further application information is given in Table 9.6.1-4. Table 9.6.1-5 lists the physico-chemical properties and the soil degradation value used for the calculations.

[9] Châteaudun (C), Hamburg (H), Jokioinen (J), Kremsmünster (K), Okehampton (N), Piacenza (P), Porto (O), Sevilla (S), Thiva (T)

Table 9.6.1-4: Application information

Active ingredient	Benzoic acid
Crop scenario	Cereals (winter)
Locations	Châteaudun (C), Hamburg (H), Jokioinen (J), Kremsmünster (K), Okehampton (N), Piacenza (P), Porto (O), Sevilla (S), Thiva (T)
Number of applications	1
Timing of Application	15 March 15 September
Single application rate [g a.i./ha]	28800
Crop interception [%]	0

Table 9.6.1-5: Properties of the active substance

Parameter	Benzoic acid
Molecular mass [g/mol]	122.12
Henry's constant [Pa m3 mol-1]	0.0133
Vapour pressure [Pa]	0.055
K_{OC} [mL/g]	18
K_{OM} [mL/g]	10.44
Freundlich sorption exponent (1/n)	1
pH-dependence	no
DT50 [days] (laboratory studies)	0.9 days
Plant uptake factor	0
Q10	2.58

Table 9.6.1-6 and following summarise the results of the FOCUS PEARL calculations for MENNO Florades and its active ingredient Benzoic acid in winter cereals.

Table 9.6.1-6: Leaching concentrations of Benzoic acid after application in winter cereals

FOCUS PEARL 4.4.4 for application in cereals	
Date: 15 March, application rate 28800 g a.i./ha	
Location	Annual concentration in groundwater [µg a.i./L] (80th %ile value in the percolate at 1 m soil depth)
Châteaudun (C)	0.000000
Hamburg (H)	0.000001
Jokioinen (J)	0.000000
Kremsmünster (K)	0.000007
Okehampton (N)	0.001170
Piacenza (P)	0.000015
Porto (O)	0.000034
Sevilla (S)	0.000000
Thiva (T)	0.000000

FOCUS PEARL 4.4.4 for application in cereals	
Date: 15 September, application rate 28800 g a.i./ha	
Location	Annual concentration in groundwater [µg a.i./L] (80th %ile value in the percolate at 1 m soil depth)
Châteaudun (C)	0.000000
Hamburg (H)	0.000049
Jokioinen (J)	0.002594
Kremsmünster (K)	0.000003
Okehampton (N)	0.000026
Piacenza (P)	0.000015
Porto (O)	0.000036
Sevilla (S)	0.000000
Thiva (T)	0.000000

IIIA 9 Conclusion

The predicted environmental concentrations in groundwater (PEC_{GW}) were calculated for the application of Benzoic acid for 26 years using FOCUS PEARL 4.4.4. Calculations were performed for a rate reaching soil of 28800 g a.i./ha, for 9 representative locations and two time-points. In each case, calculated PEC_{GW} values were below 0.1 µg/L. FOCUS PEARL 4.4.4 calculations for Benzoic acid demonstrate that no unacceptable leaching of Benzoic acid into groundwater is to be expected from the intended GAP-use of this product.

Becker, E.-M. (2013)

zRMS Comments:	The applicant provided a worst case simulation with the unlikely assumption that the applied desinfactant will leach totally into the soil via cracks. The zRMS agrees with the input parameters used. Even with this assumption, no concentrations >0.1 µg/L are ecpected according to modelling.
zRMS Conclusions:	No contamination of the ground water in concentrations >0.1 µg/L are ecpected.

KIIIA1 9.6.1. Becker, E.-M. (2013c)

Dossier No.:	**KIIIA1-9.6.1/03**
Title:	Becker, E.-M. (2013), MENNO Florades: Predicted environmental concentrations (PEC) of Benzoic acid in groundwater using FOCUS MACRO 5.5.3 for application in cereals DHD-Consulting GmbH, Germany
Document No.	MEN-2013-05
Report date	13 June 2013
Guidelines	SANCO/321/2000 rev. 2 – Focus groundwater scenarios in the EU review of active substances; Generic guidance for Tier 1 FOCUS groundwater assessments, vers. 2.0 (01.2011)
GLP	No

The predicted environmental concentration in groundwater (PEC_{GW}) was calculated for application of Benzoic acid for 26 years using FOCUS MACRO 5.5.3. The location Châteaudun was chosen as representative location for Europe. Winter cereals were selected as crop scenario, because it covers all locations. Since there is no fixed application time point for MENNO Florades, two representative application time points in spring and autumn were selected for PEC_{GW} calculation.

- Calculations were performed for the worst case scenario with an application rate of 28800 g a.i./ha.

Further application information is provided in Table 9.6.1-7. Table 9.6.1-8 lists the physico-chemical properties.

Table 9.6.1-7: Application information

Active ingredient	Benzoic acid
Crop scenario	Cereals (winter)
Locations	Châteaudun (C)
Number of applications	1
Timing of Application	15 March (Julian day 74) 15 September (Julian day 258)
Single application rate [g a.i./ha]	28800
Crop interception [%]	0

Table 9.6.1-8: Properties of the active substance

Parameter	Benzoic acid
Molecular mass [g/mol]	122.12
Henry's constant [Pa m3 mol-1]	0.0133
Vapour pressure [Pa]	0.055
K_{OC} [mL/g]	18
K_{OM} [mL/g]	10.44
Freundlich sorption exponent (1/n)	1
pH-dependence	no
DT50 [days] (laboratory studies)	0.9 days
Plant uptake factor	0
Q10	2.58

Table 9.6.1-9 summarises the results of the FOCUS MACRO calculations for MENNO Florades and its active ingredient Benzoic acid in winter cereals.

Table 9.6.1-9: Leaching concentrations of Benzoic acid after application in winter cereals

Location: Châteaudun	Annual concentration in GW [µg a.i./L] (80th percentile value in the percolate at 1 m soil depth)
	Benzoic acid
Application date: 15 March / Julian day 74	2.78E-09
Application date: 15 September / Julian day 258	0.0

IIIA 9 Conclusion

The predicted environmental concentration in groundwater (PEC_{GW}) was calculated for application of Benzoic acid for 26 years using FOCUS MACRO 5.5.3. Calculations were performed for a rate reaching soil of 28800 g a.i./ha, for one representative location and two time-points. In each case, calculated PEC_{GW} values were below 0.1 µg/L. FOCUS MACRO 5.5.3 calculations for Benzoic acid demonstrate that no unacceptable leaching of Benzoic acid into groundwater is to be expected from the intended GAP-use of this product.

Becker, E.-M. (2013)

zRMS Comments:	The applicant provided a worst case simulation with the unlikely assumption that the applied desinfactant will leach totally into the soil via cracks. The zRMS agrees with the input parameters used. Even with this assumption, no concentrations >0.1 µg/L are ecpected according to modelling.
zRMS Conclusions:	No contamination of the ground water in concentrations >0.1 µg/L are ecpected.

KIIIA1 9.7.1. Becker, E.-M. (2013d)

Dossier No.:	**KIIIA1-9.7/01**
Title:	Becker, E.-M. (2013), MENNO Florades: Calculation of PEC_{SW} for Benzoic acid with FOCUS Surface water Tool for Exposure Predictions Step 1 using a deposition rate from greenhouse of 0.1% DHD-Consulting GmbH, Germany
Document No.	MEN-2013-08
Report date	01 August 2013
Guidelines	FOCUS (2001). "FOCUS Surface Water Scenarios in the EU Evaluation Process under 91/414/EEC". Report of the FOCUS Working Group on Surface Water Scenarios, EC Document Reference SANCO/4802/2001-rev.2. 245 pp.
GLP	No

The predicted environmental concentration in surface water (PEC_{SW}) was calculated for application of Benzoic acid using FOCUS Step 1 (Version 2.1).

- Calculations were performed for an application rate of 28.8 g a.i./ha (in consideration of 0.1% deposition rate[10] from the worst case application of 28800 g a.i./ha in closed structures, such as greenhouses or storage rooms).
- A worst-case DT_{50} in water sediment of 1000 days (worst case default) was considered for the calculations.

Application information is provided in Table 9.7-3 and the scenario data are summarised in Table 9.7-4. Table 9.7-5 lists the physico-chemical properties.

Table 9.7-6: Application information

Active ingredient	Benzoic acid
Application:	crop type = not relevant for step 1(winter cereals were selected as default) Region = not relevant for step 1 Season of application = not relevant for step 1
Number of applications	1

[10] Linders JBHJ, Jager DT (eds.), 1997.USES 2.0, The Uniform System for the Evaluation of Substances, version 2.0; supplement to EUSES. RIVM Rapport 679102037 (216 pages), cited in European Food Safety Authority, 2013. Guidance of EFSA on clustering and ranking of emissions of plant protection products and transformation products of these active substances from protected crops (greenhouses and crops grown under cover) to relevant environmental compartments. EFSA Journal 20YY;volume(issue):NNNN, 40 pp., doi:10.2903/j.efsa.20YY.NNNN

Single application rate in protected areas [g a.i./ha]	28800
Application rate after consideration of 0.1% drift from closed structures [g a.i./ha]	28.8

Table 9.7-7: Scenario data used in the calculation (default parameters)

Active ingredient	Benzoic acid
Distance to the water body [m]:	1.00
Spraydrift [% of application]:	2.7590
Runoff + drainage [% of application]:	10.00
Ratio of field to water body:	10.00
Water depth [cm]:	30.00
Sediment depth [cm]:	5.00
Effective sediment depth for sorption [cm]:	1.00
Sediment OC [%]:	5.00
Sed. bulk density [kg/L]:	0.80

Table 9.7-8: Properties of the active substance used for FOCUS Step 1 calculations

Parameter	Benzoic acid
Water solublity [mg/L]	2900.0
K_{OC}	18
DT_{50} [days] (water/sediment)*	1000

* Conservative worst case

Table 9.7-9 summarises the results of the FOCUS Step 1 calculations for MENNO Florades and its active ingredient Benzoic acid.

Table 9.7-9: Predicted environmental concentrations of Benzoic acid in surface water (PEC_{SW})*

Equilvalent application rate for drift (g/ha):	28.80
Equilvalent application rate for runoff/drainage(g/ha):	28.80
Loading to water body via drift (mg/m²):	0.0795
Loading to water body via runoff/drainage(mg/m²):	2.8800
fraction of substance entering water body in water phase:	0.9766
fraction of substance entering water body in sediment phase:	0.0234

	PECsw [µg/L]		PECsed [µg/kg dry sediment]	
Time (d)	Actual	TWA	Actual	TWA
0	9.6399			
1	9.627	9.6334	1.7329	1.7102
2	9.6203	9.6285	1.7317	1.7212
4	9.607	9.6211	1.7293	1.7258
7	9.587	9.6108	1.7257	1.7265
14	9.5406	9.5873	1.7173	1.724
21	9.4944	9.564	1.709	1.7204
28	9.4485	9.5409	1.7007	1.7165
42	9.3572	9.4949	1.6843	1.7085
50	9.3055	9.4687	1.675	1.7039
100	8.9885	9.3074	1.6179	1.6751

* Maximum PECsw values in water and sediment are calculated from single application.

Conclusion

The predicted environmental concentration in surface water (PEC_{SW}) and sediment (PEC_{sed}) was calculated for application of Benzoic acid using FOCUS Step 1. Calculations were performed for an application rate of 28.8 g a.i./ha (in consideration of 0.1% deposition rate from the worst case application of 28800 g a.i./ha in closed structures, such as greenhouses or storage rooms). **PEC_{SW} was determined 9.6399 µg/L and PEC_{sed} was determined 1.7329 µg/kg dry sediment.**

Becker, E.-M. (2013)

zRMS Comments:	Agreed.
zRMS Conclusions:	The PEC values obtained can be used for risk assessment.

Appendix 3 Table of Intended Uses justification and GAP tables

GAP- table of intended uses for all cMS (without Germany) not verified by ZRMS

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance 1	**-**	**Conc. of as 1:**	**-**
active substance 2	**-**	**Conc. of as 2:**	**-**
active substance	**Benzoic acid**	**Conc. of as:**	**90 g/L**
safener	**no**	**Conc. of safener:**	**n.a.**
synergist	**no**	**Conc. of synergist:**	**n.a.**
Applicant:	**MENNO Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**Northern + Central + Southern/EU**	**non professional use**	☐

Verified by MS: no

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
1	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Bacterial harmful organisms, Fungal harmful organisms	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
2	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Bacterial harmful organisms, Fungal harmful organisms	watering	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
3	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Bacterial harmful organisms, Fungal harmful organisms	flooding	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
4	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Viruses and viroids	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
5	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Viruses and viroids	watering	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
6	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces		Viruses and viroids	flooding	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
7	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Bacterial harmful organisms, fungal harmful organisms, Viruses and Viroids	Dipping	n.a.	a) 1 b) not relevant	not relevant	not relevant	not relevant	not relevant	4 % - 3 min. No direct treatment of plants, soil or substrates. Only for disinfection.

n.a. = not applicable

Remarks:

(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
(d) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) GCPF Codes - GIFAP Technical Monograph No 2, 1989
(f) All abbreviations used must be explained
(g) Method, e.g. high volume Coarse Spraying, low volume Coarse Spraying, spreading, dusting, drench
(h) Kind, e.g. overall, broadcast, aerial Coarse Spraying, row, individual plant, between the plants - type of equipment used must be indicated
(i) g/kg or g/l
(j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(k) The minimum and maximum number of application possible under practical conditions of use must be provided
(l) PHI - minimum pre-harvest interval
(m) Remarks may include: Extent of use/economic importance/restrictions

REGISTRATION REPORT
Part B

Section 5 Environmental Fate
Detailed summary of the risk assessment

Product code: **MENNO Florades**

Active Substance: **benzoic acid** **90** **g/L**

Central Zone
Zonal Rapporteur Member State: Germany

NATIONAL ADDENDUM – Germany

Applicant: MENNO Chemie-Vertrieb GmbH

Date: 01/08/2017

Table of Contents

Sec 5 FATE AND BEHAVIOUR IN THE ENVIRONMENT (KIIIA 9)

The exposure assessment of the plant protection product MENNO Florades in its intended uses in protected rooms is documented in detail in the core assessment of the plant protection product MENNO Florades performed by Germany.

5.1 Proposed use pattern

Full details of the proposed uses that will be assessed is included in Appendix 2.

The intended uses in Germany are covered by the core assessment.

5.2 National risk assessment

Usually the german risk assessment differs from the core assessment in terms of the models and parameters used.

Considering the outcome of the core assessment, the magnitude of exposure and the characteristics of the active substance, a specific risk assessment for Germany is not deemed necessary.

Appendix 1 List of data submitted in support of the evaluation

No additional data for national assessment submitted.

Appendix 2 Table of Intended Uses in Germany (according to BVL 2015-08-12)

GAP-Table of intended uses for Germany

GAP rev. (4), date: 2015-08-12

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance	**benzoic acid**	**Conc. of as :**	**90.00 g/L**
Applicant:	**Menno-Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**central EU**	**non professional use**	☐

Verified by MS: yes

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**			**Application rate**			**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product/ha spray volume L/m², exposure time/ concentration	g as/ha g as/m²	Water L/ha min / max		
001	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

002	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *standing areas and vessels - for disinfection -
003	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
004	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								- harmful organisms difficult to inactivate: 4 %	4%: 2.88 g as/m²			
005	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
006	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to	7200 or 14400 or 28800 g as/ha 1%:			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			
007	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -
008	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
009	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
010	DE	vegetables NNNVV	G*	bacterial and fungal	flooding,	after the last use	1	80 or 160 L/ha	7200 or			The exposure time is

			I*	harmful organisms FBPXXX**	no direct treatment of the plants	or before each reuse and after thorough mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
011	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
012	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m²	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			
013	DE	vegetables NNNVV	G* I*	viruses BXXXXX** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

014	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -
015	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
016	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
017	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
018	DE	potato SOLTU	G*	viruses BXXXXX ** viroids BXVXXX**	spraying or	after the last use or before each	1	80 or 160 or 320 L/ha	7200 or 14400 or			The exposure time is specific to the pathogen

			I*		foaming no direct treatment of the plants	reuse and after thorough mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
019	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								- harmful organisms difficult to inactivate: 4 %	4%: 2.88 g as/m²			
020	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
021	DE	potato SOLTU (reproductive material)	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -
022	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment	after the last use or before each reuse and after thorough mechanical	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary.

					of the plants	cleaning		exposure time 16 hours: 1 % exposure time 4 hours: 2%	1%: 0.72 g as/m² 2%: 1.44 g as/m²			* surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
023	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
024	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
025	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								- harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
026	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
027	DE	tobacco NIOTA	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m²	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas -

								exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			for disinfection -
028	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

** no EPPO-Code

Remarks:
(1) Numeration of uses in accordance with the application/as verified by MS
(2) Member State(s) or zone for which use is applied for
(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided
(8) Min. interval between applications (days) were relevant
(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)
(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)
(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.

REGISTRATION REPORT
Part B

Section 6: Ecotoxicological studies
Detailed summary of the risk assessment

Product code: **MENNO Florades**
Active Substance: **Benzoic acid 90 g/L**

All Zones
Zonal Rapporteur Member State: Germany

CORE ASSESSMENT

Applicant: **MENNO Chemie-Vertrieb GmbH**
Date: **01/08/2017**

Table of Contents

Sec 6 ECOTOXICOLOGICAL STUDIES (MIIIA 10)

This document comprises the risk assessment for non-target organisms being exposed to the plant protection product MENNO Florades containing benzoic acid in its intended uses in rooms, buildings or greenhouses according to Appendix 3. Since the active substance is currently undergoing a reregistration process the zRMS uses also new available data presented in the Renewal Assessment Report from 2015.

National Addenda are included containing country specific assessments for some annex points.

6.1 GAP and overall conclusions

6.1.1 Table of intended uses

Table 6.1-1: GAP and overall conclusions

Intended use	F/G	Timing (months, BBCH)	Max number appl. (interval in days)	Application per treatment		Overall conclusions						
				kg a.s./ha max	Rate/season [kg a.s./ha] max	Birds	Aquatic organisms	Mammals	Bees	Non-target arthropods	Soil organisms	Non-target plants
Indoor/ glasshouse	G	-/-	1	0.1 % of 28.2 (worst case)	-/-	X1				X1		X1

F: Field use; G: Glasshouse use

Remarks:
- Safe use identified
- Further refinement and/or risk mitigation measures are needed
- No safe use identified and considered possible

Explanations:

The colours in the Table 6-1 are intended to reflect the outcome of the assessments including the available and valid refinement steps and risk mitigations measures.

Remarks “X1”: explanation X1: No exposure expected due to use in protected areas (indoor).

6.1.2 Grouping of intended uses for risk assessment

The following table lists the grouping of the intended uses in order to perform a risk envelope approach. It has been selected from the individual GAPs in the EU for MENNO Florades. A list of all intended uses within the EU is given in Appendix 3. The following applies for all uses: "No direct treatment of plants, soil or substrates. Only for disinfection."

Table 6.1-2: Critical use pattern of MENNO Florades

Method	Application area	Water [L/ha], max.	Active substance [kg/ha], max.	Number of applications	Exposure time until full efficacy is reached	Application timing	Product con-centration
Directed coarse spray, foaming (lathering), watering (pouring of aqueous solution or foam), flooding	Protected rooms (Greenhouse, Indoor) in agriculture, horticulture and floriculture, disinfection of surfaces, tools and culture vessels/containers	8000	7.2	1	16 h	Not relevant	1 %
		8000	14.4	1	16 h	Not relevant	2 %
		8000	**28.8**	**1**	**16 h**	**Not relevant**	**4 %**
Dipping		n.a.	n.a.	n.a.	3min	Not relevant	4 %

The worst case application rate (indoor/glasshouse) is 28.8 kg Benzoic acid /ha (2880 mg/m²).

6.1.3 Consideration of metabolites

No environmental occurring metabolites of benzoic acid requiring further assessment according to the results of the assessment of benzoic acid for EU approval were detected.

6.2 Effects on birds (MIIIA 10.1, KPC 10.1, KPC 10.1.1)

No data was evaluated and agreed in the EU approval review of benzoic acid. Avian toxicity studies either conducted with benzoic acid or its formulations, are not considered necessary because:

- Benzoic acid occurs naturally or via anthropogenic sources other than plant protection in almost every environmental compartment (e.g. surface water, soil) and is essential in the metabolism of many plant species. Therefore, the substance is naturally consumed by birds and mammals via uptake of food and drinking water.
- Benzoic acid is commercially used as food preservative (E210) in high concentrations (e.g. 200 mg/L in wine and other products and alcohol-free counterparts) as well as in animal feed (e.g. CRINA® Poultry Plus, VevoVitall®).
- The acute toxicity of benzoic acid in mammals is low (Rat LD_{50} oral: > 2000 mg benzoic acid/kg bw). In animals, the substance is rapidly converted to hippuric acid, which is almost completely excreted within a short time via the urine.
- Neither plants nor soil will be treated with MENNO Florades and the application of the product takes place in protected areas only (indoor/ glasshouse). Given the nature of the indoor uses, which will only take place in the confined conditions of a glasshouse with permanent protection situations which provide full enclosure (including continuous top and side barriers down to below ground level), there will be negligible dietary exposure as birds will not be able to gain access to the treated area.

The Notifier submitted a study from the published literature (Schafer *et al.*, 1983[1]). The study resulted in an acute oral LD_{50} value for redwinged blackbirds and starlings exposed to benzoic acid technical administered via the oral gavage of LD_{50} > 100 mg a.s./kg b.w. Since the study is not GLP compliant, it will be considered as supportive information only, by confirming the low toxicity of benzoic acid.

6.2.1.1 Drinking water exposure

Benzoic acid is supposed to show a fast decline of in the aquatic environment, even in rainwater, where the concentration of microorganisms is assumed to be low. Since MENNO Florades is not intended to be applied on leafy vegetables forming heads or other water collecting structures, the leaf scenario does not have to be considered. The puddle scenario does not have to be considered either, because MENNO Florades is intended to be supplied indoor.

[1] Schafer Jr, E. W., W. A. Bowles Jr, and J. Hurlbut. "The acute oral toxicity, repellency, and hazard potential of 998 chemicals to one or more species of wild and domestic birds." Archives of environmental contamination and toxicology 12.3 (1983): 355-382; for further information please refer to RAR 11 Volume 3 CA B9 2015 of benzoic acid.

6.2.1.2 Effects of secondary poisoning (MIIIA 10.1.9)

The EFSA birds and mammals guidance document (EFSA Journal 2009; 7(12): 1438) states that a log $K_{ow} \geq 3$ is used to indicate that there might be a potential for bioaccumulation (see chapter 5.6 "Bioaccumulation and food chain behaviour"). Since the log K_{ow} value of benzoic acid is 1.9 (pH=7), the active substance is deemed to have a negligible potential to bioaccumulate in animal tissues. No formal risk assessment for secondary poisoning is therefore required.

6.2.2 Biomagnification in terrestrial food chains

Not relevant.

6.2.3 Risk assessment (MIIIA 10.1.3, MIIIA 10.1.4, MIIIA 10.1.5) for baits, pellets, granules, prills or treated seed

Not relevant.

6.2.4 Overall conclusions

Birds are not supposed to be at risk following the intended uses of MENNO Florades due to the natural occurrence of the active substance benzoic acid, its commercial use in food and feedstuff as well as its low toxicity. The exposure from the use as plant protection product can be considered negligible since MENNO Florades is intended to be used indoor only.

6.3 Effects on Terrestrial Vertebrates Other Than Birds (MIIIA 10.3, KPC 10.1, KPC 10.1.2)

Benzoic acid is of low toxicity to mammals. It is highly unlikely that mammals will be exposed to the intact product as the use of Menno Florades applied for is in indoor situations and in order to avoid unnecessary vertebrate testing, the risk to mammals from the proposed uses of Menno Florades will be assessed using the endpoints for benzoic acid.

Table 6.3-1: EU agreed endpoints and new endpoints

Species	Substance	Exposure System	Results	Reference	Internal code
Rat	Benzoic acid	Acute oral toxicity	LD_{50} > 1700 mg a.s./kg b.w.	[redacted] (1962)	88974
Rat	MENNO Florades	Acute oral toxicity	LD_{50} > 2000 mg product/kg b.w.	[redacted] (1994)	88976
Rat	Benzoic acid	Reproduction study, four generations	500 mg a.s./kg b.w./day (NOAEL > 10000 ppm)	[redacted] (1960)	88975

All endpoints are reported in the DAR from 2000 and are reconfirmed in the current reassessment procedure.

6.3.1 Justification for new endpoints

Not necessary.

6.3.2 Risk assessment

Exposure of mammals is predominantly dietary, through the consumption of residues on food items. However given the nature of the indoor uses, which will only take place in the confined conditions of a glasshouse, there will be negligible dietary exposure as mammals will not be able to gain access to the treated area.

As a worst case scenario zRMS considers 0.1% of the applied amount of the active substance to leave the indoor facility and therefor can be considered as available for terrestrial vertebrates. A screening under worst case assumptions is performed to ensure an acceptable risk to mammals following the exposure of MENNO Florades.

Table 6.3-2: Worst case acute and chronic screening assessment

Intended use	Indicator species	Endpoint	SV	MAF	DDD [mg/kg bw/d]	TER
Benzoic acid - acute						
indoor/glasshouse 0.288 kg benzoic acid /ha (relates to 0.1% of 28.8 kg benzoic acid /ha)	Small herbivorous mammal	LD_{50} > 1700 mg a.s./kg b.w.	136.4*	MAF_{90} 1	39.3	43
Benzoic acid - chronic						
indoor/glasshouse 0.288 kg benzoic acid /ha (relates to 0.1% of 28.8 kg benzoic acid /ha)	Small herbivorous mammal	NOAEL = 500 mg a.s./kg b.w./day	72.3*	MAF_m 1	20.8	24

* referring to worst case exposure (highest SV-value available)

6.3.2.1 Drinking water exposure

Benzoic acid is supposed to show a fast decline of in the aquatic environment, even in rainwater, where the concentration of microorganisms is assumed to be low. Since MENNO Florades is not intended to be applied on leafy vegetables forming heads or other water collecting structures, the leaf scenario does not have to be considered. The puddle scenario does not have to be considered either, because MENNO Florades is intended to be supplied indoor.

6.3.2.2 Effects of secondary poisoning (MIIIA 10.3.2.3)

The EFSA birds and mammals guidance document (EFSA Journal 2009; 7(12): 1438) states that a log $K_{ow} \geq 3$ is used to indicate that there might be a potential for bioaccumulation (see chapter 5.6 "Bioaccumulation and food chain behaviour"). Since the log K_{ow} value of benzoic acid is 1.9 (pH=7), the

active substance is deemed to have a negligible potential to bioaccumulate in animal tissues. No formal risk assessment from secondary poisoning is therefore required.

6.3.3 Biomagnification in terrestrial food chains

Not relevant.

6.3.4 Risk assessment (MIIIA 10.3.1) for baits, pellets, granules, prills or treated seed

Not relevant.

6.3.5 Overall conclusions

Terrestrial vertebrates other than birds are not supposed to be at risk following the intended uses of MENNO Florades. The performed risk assessment under worst case assumptions and an exposure regime of 0.1% of the active substance applied indoor resulted in TER values clearly higher than the established trigger values of 10 for acute and 5 for chronic risk assessment. Furthermore the low risk following an exposure to benzoic acid is supported due to the natural occurrence of the active substance, its commercial use in food and feedstuff as well as its low toxicity. The exposure from the use as plant protection product can be considered negligible since MENNO Florades is intended to be used indoor only.

6.4 Effects on other terrestrial vertebrate wildlife (reptiles and amphibians) (KPC 10.1.3)

Not yet considered.

6.5 Effects on aquatic organisms (MIIIA 10.2, KPC 10.2, KPC 10.2.1)

Table 6.5-1: Endpoints used for risk assessment for aquatic organisms for benzoic acid

Species	Substance	Exposure System	Results [mg a.s./L]	Reference	Internal code
Oncorhynchus mykiss	Benzoic acid	96 h, semi-static	LC_{50} > 120 mg a.s./L_{nom} 1)	[redacted] 1998 NA 98 9408/3	38567
No reliable long term data for fish available 2)					
Daphnia magna	Benzoic acid	48 h,semi- static	EC_{50} > 120 mg a.s./L_{nom} 1) NOEC = 55 mg/L_{nom}	Jonas, W. 1998a NA 98 9408/2	38569
No reliable long term data for invertebrates available 2)					
Pseudokirchneriella subcapitata	Benzoic acid	72 h, static	E_rC_{50} = 72 mg a.s./L_{nom} 3) E_bC_{50} = 33 mg a.s./L_{nom} 3) NOEC = 7.5 mg/L_{nom}	Jonas, W. 1998b NA 98 9408/1	38566

1) Endpoints are reported in the DAR from 2000 and are reconfirmed in the current reassessment procedure.

2) No endpoints relating to chronic exposure are reported in the DAR from 2000, no reliable data are reported in the current reassessment report.

3) Endpoints are reported in the DAR from 2000, therefore this study has been used for evaluation in Germany. However, the study validity and acceptability was not reconfirmed in the current EU re-assessment procedure. Instead the applicant has submitted a further study on *Desmodesmus subspicatus* and E_rC_{50} (growth rate) and E_yC_{50} (yield) after 72 hours were determined to be > 1000 mg a.s./L. This study has been considered as valid and reliable during EU renewal procedure.

Table 6.5-2: Endpoints used for risk assessment for aquatic organismsfor MENNO Florades

Species	Substance	Exposure System	Results [mg a.s./L]	Reference	Internal code
Brachydanio rerio	MENNO Florades	96 h, semi-static	LC_{50} > 100 mg product/L_{nom} LC_{50} > 9 mg a.s./L_{nom}	[redacted] 2009a IF-09/01469511	88928
Daphnia magna	MENNO Florades	48 h, static	EC_{50} = 255 mg product/L_{nom} EC_{50} = 23 mg a.s./L_{nom}	Lebertz, H. 2009b IF-09/01469509	88930
Desmodesmus subspicatus	MENNO Florades	72 h, static	E_rC_{50} > 1000 mg product/L_{nom} LOEC = 934 mg product/L_{mm} ≙ 84 mg a.s./L_{mm}	Lebertz, H. 2009c IF-09/01468777	88931

All endpoints were not included in the first DAR of 2000 but are now part of the renewal assessment. Please relate to study summaries in Appendix 2.

6.5.1 Justification for new endpoints

Not necessary.

6.5.2 Toxicity to exposure ratios for aquatic species (MIIIA 10.2.1)

The evaluation of the risk for aquatic organisms was performed in accordance with the recommendations of the "Guidance on tiered risk assessment for plant protection products for aquatic organisms in edge-of-field surface waters" (EFSA Journal 2013;11(7):3290).

6.5.2.1 Toxicity to exposure ratio for the active substances

In the following table the TER values for each FOCUS scenario for each organisms group are given.

Table 6.5-3: Aquatic organisms: PEC_{sw} for benzoic acid and relevant ecotoxicological endpoints for each organism' group.

Scenario	**PEC_{SW} global max**	**Fish acute**	**Fish acute (product)[1]**	**Invertebrates acute**	**Invertebrates acute (product)[1]**	**Algae**	**Algae (product)[1]**
		O. mykiss	***O. mykiss***	***D. magna***	***D. magna***	***P. subcapitata***	***D. subspicatus***
FOCUS		**LC_{50}**	**LC_{50}**	**EC_{50}**	**EC_{50}**	**E_bC_{50}**	**E_rC_{50}**
		> 120	> 9	> 120	23	33	> 84
	[µg/L]	**[mg/L]**	**[mg/L]**	**[mg/L]**	**[mg/L]**	**[mg/L]**	**[mg/L]**
Step 1							
	9.6399	> 10,000	> 900	> 10,000	> 2000	> 3000	> 8000
TER criterion		100	100	100	100	10	10

TER values shown in bold fall below the relevant trigger. 1) Endpoints relating to the a.s. but derived from product testing.

6.5.2.2 Risk assessment for the product, valid for run-off and not run-off endangered areas (based on drift only)

Not relevant since product is supposed to be used indoor.

6.5.2.3 Consideration of Metabolites

Not relevant.

6.5.2.4 Accumulation in aquatic non-target organisms

Bioaccumulation of the active substance under natural conditions is not expected to occur. Since the log K_{ow} value of benzoic acid is 1.9 (pH=7), the active substance is deemed to have a negligible potential to bioaccumulate in animal tissues. A study to determine bioaccumulation in aquatic non-target organisms is therefore not necessary.

6.5.3 Overall conclusions

Based on the calculated concentrations of benzoic acid in surface water (PEC_{SW} FOCUS Step 1), the calculated TER values for the acute risk resulting from an exposure of aquatic organisms to benzoic acid according to the GAP of the formulation MENNO Florades achieve the acceptability criteria TER ≥ 100, according to commission implementing regulation (EU) No 546/2011, Annex, Part I C, 2. Specific principles, point 2.5.2. The results of the assessment indicate an acceptable acute risk for aquatic organisms due to the intended indoor use of MENNO Florades according to the label.

Since no reliable long term toxicity data are available but the acute risk is very low the zRMS does not expect benzoic acid to pose an unacceptable long term risk to the aquatic environment. Furthermore the active substance benzoic acid is naturally occurring in the environment and the application of the formulated

product MENNO Florades is intended for indoor uses only, the risk to aquatic organisms is expected to be low.

6.6 Effects on bees (MIIIA 10.4, KPC 10.3.1)

The product MENNO Florades is used as disinfectant of surfaces and tools in protected areas only (e.g. greenhouse, machine halls etc.). It was not a representative formulation in the EU review and no toxicity data with the formulation or the active substances were presented here. However, the available information is sufficient for the risk assessment.

Toxicity
The active substance benzoic acid is a natural compound exerting a low toxicity towards animals. The following table presents the results of the first EU review.

Results of laboratory bee toxicity studies

Test substance	Exposure route	LD_{50}	Reference
benzoic acid tech.	oral 48 h	not required *	Review report for the active substance benzoic acid (2003) SANCO/1396/2001-Final
	contact 48 h	not required *	

* EU agreed endpoint

Exposure
The recommended use pattern for MENNO Florades includes application at a maximum application rate of up to 320 L product/ha. This maximum single application rate is equivalent to 28.8 kg a.s./ha.
As the product MENNO Florades is used in protected areas only and a direct treatment of plants is not intended, exposure to honeybees is very unlikely.

Hazard quotients
The Hazard Quotient (HQ) approach is not applicable due to the proposed use of MENNO Florades.

Risk assessment
The product MENNO Florades is used in protected areas only and a direct treatment of plants is not intended. Hence, a risk for honeybees can be excluded.

Overall conclusion:
It is concluded that MENNO Florades will not adversely affect bees or bee colonies when used as recommended.

The following restrictions should be included on the label:
Due to the manner in which authorisation governs application of the product, bees are not endangered.

No acute toxicity studies with the formulation were generated in accordance with OECD 213/214, EPPO 170 or other appropriate test guidelines and GLP requirements were presented.

Effects on bees of residues on crops, cage tests, field tests, investigation into special effects, larval toxicity, long residual effects, disorienting effects on bees, and tunnel tests are not required.

6.7 Effects on arthropods other than bees (MIIIA 10.5, KPC 10.3.2)

Benzoic acid is a natural compound in almost every environmental compartment (water, soil etc.) and it is ready biodegradable in natural systems (the compound is used as reference compound in the OECD 301 test for ready biodegradability). The product MENNO Florades is used as disinfectant of surfaces and tools in protected areas only (e.g. greenhouse, machine halls etc.). A discharge of the product to the environment is unlikely and the intended use of the product does not include a direct treatment of plants or any potential food items for wild animals. Considering these aspects, no risk for non-target arthropods from the use of MENNO Florades is assumed and no further assessments were performed.

6.8 Effects on non-target soil meso- and macrofauna (MIIIA 10.6, KPC 10.4, KPC 10.4.1, KPC 10.4.2)

Table 6.8-1: Summary of available endpoints for earthworms and other soil macro- and mesofauna

Species	Substance	Exposure System	Results	Reference	Internal code
Eisenia fetida	Benzoic acid	Chronic, 56 days, artificial soil, 5% peat	NOEC = 384 mg a.s./kg dw soil	Winkelmann, G. 2013a RBR15572	88942
Folsomia candida	Benzoic acid	Chronic, 28 days, artificial soil, 5% peat	NOEC = 143 mg a.s./kg dw soil	Bruhnke, C.. 2013 ICR15572	88943

No correction of endpoints was performed since the log Kow of benzoic acid is < 2.

Both endpoints were not included in the first DAR of 2000 but are now part of the renewal assessment. Please relate to study summaries in Appendix 2.

No studies were performed to evaluate the toxic risk to soil meso- and macrofauna following an exposure to the active substance benzoic acid and MENNO Florades.

As the formulation MENNO Florades does not contain any co-formulants which are suspected to enhance the toxicity of the formulation in comparison to the active substance a long-term study with the formulated product was not performed. Therefore the chronic toxicity risk assessment is conducted using the existing endpoint from the reproduction study performed with the active substance.

6.8.1 Toxicity exposure ratios for earthworms and other soil macro- and mesofauna, TER_A and TER_{LT} (MIIIA 10.6.1)

The evaluation of the risk for earthworms and other soil macro-organisms was performed in accordance with the recommendations of the “Guidance Document on Terrestrial Ecotoxicology”, as provided by the Commission Services (SANCO/10329/2002 rev 2 (final), October 17, 2002).

For the calculations of predicted environmental concentrations in soils (PEC soil), reference is made to the environmental fate section (Part B, Section 5) of this submission.

Since the formulated product MENNO Florades is supposed to be used in protected areas only, a direct exposure of soil fauna to the active substance is not likely to occur. In chronic studies with the active substance conducted on *Eisenia fetida* and *Folsomia candida* up to 384 and 143 mg a.s./kg dw soil showed no signs of increased mortality. Since the PEC_{soil} is supposed to be 0.038 mg a.s./kg soil dw the acute risk for earthworms and other non-target soil macro- and mesofauna resulting from an exposure to benzoic acid is assumed to be very low.

The chronic risk for earthworms and other non-target soil macro- and mesofauna resulting from an exposure to the active substance benzoic acid (0.1% of indoor application rate) was assessed by comparing the maximum PEC_{SOIL} with the NOEC value to generate chronic TER values. The TER_{LT} was calculated as follows:

$$TER_{LT} = \frac{NOEC\ (mg/kg)}{PEC_{soil}\ (mg/kg)}$$

The results of the risk assessment are summarized in the following table.

Table 6.8-2: TER values for earthworms and other soil macro- and mesofauna (Tier-1), indoor/glasshouse, 0.288 kg Benzoic acid /ha (relates to 0.1% of 28.8 kg Benzoic acid/ha)

Species	Test item	Time scale	Endpoint [mg/kg soil dw]	Max. PEC_{SOIL} [mg/kg soil dw]	TER
Eisenia fetida	Benzoic acid	Chronic	384 mg a.s./kg dw soil	0.038	> 10,000
Folsomia candida	Benzoic acid	Chronic	143 mg a.s./kg dw soil	0.038	> 3000

TER values shown in bold fall below the relevant trigger.

6.8.2 Higher tier risk assessment

Not relevant.

6.8.3 Overall conclusions

Based on the predicted concentrations of benzoic acid in soils, the TER values describing the long-term risk for earthworms and other non-target soil organisms following exposure to benzoic acid according to the GAP of the formulation MENNO Florades achieve the acceptability criteria of TER ≥ 5 according to commission implementing regulation (EU) No 546/2011, Annex, Part I C, 2. Specific principles, point 2.5.2. The results of the assessment indicate an acceptable risk for soil organisms due to the intended use of MENNO Florades in protected areas according to the label.

6.9 Effects on soil microbial activity (MIIIA 10.7, KPC 10.5)

Table 6.9-1: EU agreed endpoints and new endpoints for soil microorganisms

Substance	Test design	Results	Source	Internal code
Benzoic acid	N-mineralisation	7% inhibition at 192 mg/kg soil dw (1% inhibition at 38.4 mg/kg soil dw)	Winkelmann G. 2013b TBN15572	88955

This endpoint was not included in the first DAR of 2000 but is now part of the renewal assessment. Please relate to study summaries in Appendix 2.

6.9.1 Risk assessment

The evaluation of the risk for soil microbial activity was performed in accordance with the recommendations of the "Guidance Document on Terrestrial Ecotoxicology", as provided by the Commission Services (SANCO/10329/2002 rev 2 (final), October 17, 2002).

Please refer to above for the predicted environmental concentrations in soil (PEC_{SOIL}) of benzoic acid.

The results of the risk assessment are summarized in the following table.

Table 6.9-2: Risk assessment for effects on soil micro-organisms, indoor/glasshouse, 0.288 kg Benzoic acid /ha (relates to 0.1% of 28.8 kg Benzoic acid/ha)

Test substance	Test concentration (adverse effects < 25%) [mg /kg]	PEC_{SOIL} [mg/kg]	Risk acceptable [yes/no]
Benzoic acid	192	0.038	yes

6.9.2 Overall conclusions

Based on the predicted concentrations of benzoic acid in soils, the risk to soil microbial processes following exposure to benzoic acid according to the GAP of the formulation MENNO Florades is considered to be acceptable according to commission implementing regulation (EU) No 546/2011, Annex, Part I C, 2. Specific principles, point 2.5.2.

6.10 Effects on non-target plants (MIIIA 10.8, KPC 10.6)

The product MENNO Florades is used as disinfectant of surfaces and tools in protected areas only (e.g. greenhouse, machine halls etc.). A discharge of the product to the environment is unlikely and the intended use of the product does not include a direct treatment of plants. The active substance benzoic acid is a natural occurring compound in plants and fruits (e.g. *Vaccinium* spp. (> 1300 mg/kg free benzoic acid). Apart from this, it was stated that no unacceptable effects on the environment are expected for the active substance Benzoic acid (SANCO/1396/2001-Final). Considering these aspects, no risk for non-target plants from the use of MENNO Florades is assumed and no assessments were performed.

6.11 Effects on other terrestrial organisms (flora and fauna) (KPC 10.7)

No studies on effects on other terrestrial organisms were conducted with active ingredient or the product formulation.

6.12 Monitoring data (KPC 10.8)

No monitoring data are available with the active substance or the formulated product MENNO Florades.

6.13 Available preliminary data (IIIA 10.9)

No data available.

6.14 Other/special studies (IIIA 10.10)

No studies were conducted with the active ingredient or the product formulation.

Appendix 1 List of data submitted in support of the evaluation

Table A 1: List of data submitted in support of the evaluation

Annex point/ reference No	Author(s)	Year	Title Source (where different from company) Report-No. GLP or GEP status (where relevant), Published or not Authority registration No	Data protection claimed [Y/N]	Owner	How considered in dRR Study-Status/Usage*
KIIIA1-10.2.2.1/01	[redacted]	2009a	Study on the Acute Toxicity Towards Fish of „MENNO Florades“ according to OECD-Test Guideline 203 Edition dated July 17th,1992 [redacted] Report no.: IF-09/01469511 Report date: 07 December 2009 GLP, unpublished	Y	MEN	1
KIIIA1-10.2.2.2/01	Lebertz, H.	2009b	Study on the Acute Toxicity Towards Daphnia of „MENNO Florades“ according to OECD-Test Guideline 202 (Version dated 13.04.2004) Institut Fresenius GmbH, Taunusstein, Germany Report no.: IF-09/01469509 Report date: 07 December 2009 GLP, unpublished	Y	MEN	1
KIIIA1-10.2.2.3/01	Lebertz, H.	2009c	Study on the Acute Toxicity Towards Algae of „MENNO Florades“ according to OECD-Test Guideline 201 (Alga, Growth Inhibition Test), Version dated 23-Mar-2006 Institut Fresenius GmbH, Taunusstein, Germany Report no.: IF-09/01468777 Report date: 07 December 2009 GLP, unpublished	Y	MEN	1
KIIA-8.9.2/01,	Winkelmann, G.	2013a	Benzoic acid - Earthworm (Eisenia fetida), Effects on Reproduction according to OECD-Test Guideline 222, Version dated 23 Nov 2004 Dr. U. Noack-Laboratorien, Sarstedt, Germany Project-No. 130611DH / Study-No. RBR15572 Report date: 22 November.2013 GLP, unpublished	Y	MEN	1
KIIA-8.9.3/01,	Bruhnke, C.	2013	Benzoic acid - Collembolan (Folsomia candida) Reproduction Test in Soil, acc. to OECD 232 (2009), Verison dated 2009 Dr. U. Noack-Laboratorien, Sarstedt, Germany Project-No. 130611DH / Study-No. ICR15572 Report date: 02 December 2013 GLP, unpublished	Y	MEN	1

KIIA-8.10.1/01	Winkelmann, G.	2013b	Benzoic acid - Soil Micro-Organisms: Nitrogen Transformation Test according to OECD-Test Guideline 216 Dr. U. Noack-Laboratorien, Sarstedt, Germany Project-No. 130611DH / Study-No. TBN15572 Report date: 20 December 2013 GLP, unpublished	Y	MEN	1

*1) accepted (study valid and considered for evaluation)

2) not accepted (study not valid and not considered for evaluation)

3) not considered (study not relevant for evaluation)

4) not submitted but necessary (study not submitted by applicant but necessary for evaluation)

5) supplemental (additional information, alone not sufficient to fulfil a data requirement, considered for evaluation)

Appendix 2
Detailed evaluation of the new studies

IIIA 10.2 Effects on aquatic organisms

IIIA 10.2.2 Acute toxicity (aquatic) of the preparation

IIIA 10.2.2.1 Fish acute toxicity LC_{50}, freshwater, cold-water species

IIIA 10.2.2.1/01- [redacted] (2009a)

Reference:	KIIIA 10.2.2.1/01
	Study on the Acute Toxicity Towards Fish of „MENNO Florades“ according to OECD-Test Guideline 203 Edition dated July 17th,1992
Author(s), year:	[redacted] (2009)
Report/Doc number:	IF-09/01469511
Guidelines:	Yes, OECD Guideline 203 (1992)
GLP:	Yes
Deviations:	No
Validity:	Yes

Executive Summary

‚MENNO Florades" was tested for acute toxicity towards fish (*Brachydanio rerio*) according to OECD-Test Guideline 203. In order to investigate the influence of the test item towards the fish, the animals were exposed to the maximum of 100 mg of the test item per liter of test solution. Under the conditions used for the test, toxic effects of the test item towards fish were not observed. Thus, the following effect concentrations are assumed:

$LC_0 \geq 100$ mg/L[1]

$LC_{50} > 100$ mg/L[1]

$LC_{100} > 100$ mg/L[1]

[1] Directly taken from the concentration being tested

As a result of the supporting analyses, it can be stated, that the test item remained sufficiently stable during the incubation period, and thus, the effective concentrations are based on the nominal concentrations tested.

Table 10.2.2.1-1 Concentrations of the test item during incubation

Nominal Concentration [mg/L]	Measured Concentration Benzoic Acid [mg/L]	Calculated Concentration of the Test Item [mg/L]	%-Value of Nominal Concentration
t0			
100	8.276	91.5	91.5

Control	0	0.0	-
t24h			
100	3.18*)	35.2	(35.2)
Control	0	0.0	-
t0'			
100	5.033*)	55.7	(55.7)
Control	0.0104	0.1	-
t24h'			
100	8.862	98.0	98.0
Control	0	0.0	-

*) Artefact
Flasks were broken during thawing process. The treatment was collected in a beaker made of glass. It cannot be excluded that there was a significant loss of test item (active matter = Benzoic acid) during that process. Within a parallel study with Daphnia magna, also a sufficient stability was proved. Therefore, the respective results are not used for final calculations.

The criteria of validity of results given by the OECD Guideline 203 were kept within this study. In the control no dead animals were observed. In the test solutions the oxygen concentration did not drop below a value of 60% of the saturation value (~5 mg 0_2/L).

Table 10.2.2.1-2 Accompanying determinations (Main Test = Limit-Test, semistatic test procedure):

Nominal conc. of Test Item [mg/L]	**Incubation time [h]**	**pH-Value**		**O_2-Content [mg O_2/L]**		**Temperature [°C]**	
		t_0 1)	**(t_{24h}) 2)**	**t_0 1)**	**(t_{24h}) 2)**	**t_0 1)**	**(t_{24h}) 2)**
Control (0)	0	7.90	-	8.4	-	23.5	-
	22.5	8.01	8.42	8.4	8.3	21.8	21.5
	46.0	7.74	8.48	8.3	8.2	22.5	21.5
	70.3	7.80	8.44	7.8	7.9	22.3	21.8
	96.0	-	8.52	-	7.9	-	21.9
100	0	7.72	-	8.4	-	22.4	-
	22.5	7.76	8.46	8.3	8.4	221.	21.5
	46.0	7.73	8.32	8.3	8.2	22.3	21.5
	70.3	7.79	8.38	8.3	8.0	22.3	21.7
	96.0	-	8.41	-	7.9	-	21.8

1) values in the fresh test solutions, respectively; 2) after 24h of incubation with the fish

Comments of zRMS:	The zRMS consideres the study valid and acceptable. The reported LC_{50} > 100 mg product/L_{nom} (LC_{50} > 9 mg a.s./L_{nom}) is used in the risk assessment.

IIIA 10.2.2.2 Acute toxicity (24 & 48 h) for Daphnia preferably Daphnia magna

IIIA 10.2.2.2/01- Lebertz, H. (2009b)

Reference:	**KIIIA 10.2.2.2/01** Study on the Acute Toxicity Towards Daphnia of „MENNO Florades“ according to OECD-Test Guideline 202
Author(s), year:	Lebertz, H. (2009)
Report/Doc number:	IF-09/01469509
Guidelines:	Yes, OECD Guideline 202 (2004)
GLP:	Yes
Deviations:	The temperature values are higher (21.5 - 22°C) than indicated in the study plan. This represents a deviation of the study plan which is not considered to have an influence on the integrity of the study.
Validity:	Yes

Executive Summary

‚MENNO Florades" was tested for acute toxicity towards Daphnia according to OECD-Test Guideline 202. In order to investigate the influence of the test item towards the daphnia the swimming behaviour of the animals was recorded. Under the conditions used for the test, immobilisation of the daphnia was observed at nominal concentrations > 100 mg/L.

Chemical analysis

Within chemical analyses performed with the test solutions at t0 and t48h, it could be shown, that the test item remained stable in the aqueous phase. At no time recoveries lower 80% were measured. Therefore the results of this test are based on the nominal concentrations tested.

Immobility

The percentage immobility was determined in all test item and control groups after 24 and 48 h.

Table10.2.2.2-1: Percentage of Daphnids incapable of Swimming after 24 and 48 h of Exposure (n=20)

Nominal concentration [mg/L]	Immobilisation [%]	
	Mean value after 24 h	Mean value after 48 h
Control (0)	0 [0/20][1)]	0 [0/20][1)]
100	0 [0/20][1)]	0 [0/20][1)]
200	5 [1/20][1)]	25 [5/20][1)]
400	30 [6/20][1)]	90 [18/20][1)]

800	75 [15/20][1)]	100 [20/20][1)]
1000	80 [16/20][1)]	100 [20/20][1)]

[1)] Numbers in brackets give the absolute numbers of immobilised animals at each concentration

Environmental parameters

Table 10.2.2.2-2: Recorded environmental parameters

Nominal concentration [mg/L]	pH-value		O_2-content [mg O_2/L]		Temperature [°C]	
	t_0	t_{48h}	t_0	48 h	t_0	48 h
Control (0)	8.77	7.78	8.24	8.0	21.9	21.5
100	8.79	7.76	8.19	7.8	21.9	21.5
200	8.79	7.68	8.16	7.6	21.9	21.5
400	8.76	8.64	8.15	7.3	22.0	21.5
800	8.68	7.64	8.23	7.3	21.9	21.5
1000	8.59	7.62	8.12	7.3	21.9	21.5

The following EC-values were calculated on basis of the nominal concentrations being tested:

Table 10.2.2.2-3: Calculated EC-values (based on nominal concentrations)

	24h	48h	95% confidence limit	
			24h	48h
NOEC	200 mg/L	100 mg/L		
LOEC	400 mg/L[1)]	200 mg/L		
EC_{10}	252 mg/L	165 mg/L	154-330	114-199
EC_{20}	331 mg/L	191 mg/L	228-415	144-226
EC_{50}	557 mg/L	255 mg/L	450-689	214-303
EC_{100}	> 1000 mg/L[1)]	800 mg/L[1)]		

[1)] Directly taken from the concentration being tested

***Daphnia magna* 48 h EC_{50} = 255 mg MENNO Florades/L**

Comments of zRMS:	The zRMS consideres the study valid and acceptable. The reported EC_{50} = 255 mg product/L_{nom} (EC_{50} = 23 mg a.s./L_{nom}) is used in the risk assessment.

IIIA 10.2.2.3 Effects on algal growth and growth rate

IIIA 10.2.2.3/01- Lebertz, H. (2009c)

Reference:	**KIIIA 10.2.2.3/01**
	Study on the Acute Toxicity Towards Algae of „MENNO Florades“ according to OECD-Test Guideline 201
Author(s), year:	Lebertz, H. (2009)
Report/Doc number:	IF-09/01468777
Guidelines:	Yes, OECD Guideline 201 (2006)
GLP:	Yes
Deviations:	The main test was done at 25 °C instead of 21-24 °C indicated in the study plan. This represents a deviation of the study plan which is not considered to have an influence on the results of the test. A constant temperature ±1 °C is advised by the OECD Guideline 201.
Validity:	Yes

Executive Summary

The chronic toxicity of “MENNO Florades" towards algae was tested according to OECD-Test Guideline 201, performed with the aqueous solution of the test item. The toxic effect was investigated by determination of the inhibition of the growth rate of the algae, the yield during the exposure period of 72 h. As a conclusion of the analytical part of this study, recoveries of the theoretical concentrations were not higher than 80 % within the three lowest test treatments, and therefore the effective concentrations are based on the measured concentrations. According to the statistical evaluation using the Williams test (which is the most stringent test for NOEC determination) the different treatments are compared with the non-affected control. In this test at a concentration of 500 mg/L (nominal concentration) an inhibitory effect of yield was determined to be 3.5% which is not recognized as a significant effect (as being lower than the threshold value of < 7.5%). At the nominal concentration of 500 mg/L the recovery of the test item was > 96%.

Table 10.2.2.3-1 Quantification of the Test Item in the Test Solutions of the Biological Part of the Study

Nominal Concentration [mg/L]	Measured Concentration Benzoic Acid [mg/L]	Calculated 1> Concentration of the Test Item [mg/L]	Net Values (net-Control)	%Value of t_0	%-Value of Nominal Concentration	Mean Concentration (geometric mean) of t0 vs. t72h
t_0						
62.5	5.759	63.7	63.6	-	101.8	
125	11.181	123.7	123.6	-	98.9	
250	22.595	249.9	249.8	-	99.9	
500	43.093	476.7	476.6	-	95.3	
1000	89.505	990.1	990.0	-	99.0	

Control	0.009	0.1	0.0	-	-	
			t_{72h}			
62.5	0.055	0.6	0.6*)	1.0	1.0	8.0
125	0.039	0.4	0.4*)	0.3	0.3	11.1
250	0.000	0.0	0.0*)	0.0	0.0	15.8
500	43.559	481.8	481.8	101.1	96.4	479.2
1000	79.644	881.0	881.0	89.0	88.1	933.9
Control	0.000	0.0	0.0	-	-	-

*) not taken for calculation of geometric mean as the values are < 1. 1> The basis for calculation of the concentration of the test item was the content of Benzoic acid in the test item representing 9.04% Benzoic acid.

Table 10.2.2.3-2 Summary of acute toxicity data

On the basis of nominal concentrations tested [mg/L]		**On the basis of measured concentrations tested [mg/L]**	
Yield (0 - 72 h)		**Yield (0 - 72 h)**	
EC_{50}	933	EC_{50}	n. d. (> 1000)
95 % confidence interval	909 - 957	95 % confidence interval	n. d.
LOEC	1000	LOEC	934
NOEC	500	NOEC	479
Growth rate (0 - 72 h)		**Growth rate (0 - 72 h)**	
EC_{50}	n. d. (> 1000)	EC_{50}	n. d. (> 1000)
95 % confidence interval	n. d.	95 % confidence interval	n. d.
LOEC (Yield)	1000	LOEC (Yield)	934
NOEC (Yield)	500	NOEC (Yield)	479

n. d. = not determined due to mathematical reasons

The test was considered valid as all conditions for validity were met.

EC_{50} Yield = n. d. (> 1000 mg/L))
EC_{50} Growth = n. d. (> 1000 mg/L)

Comments of zRMS:	The zRMS considers the study valid and acceptable. The reported E_rC_{50} > 1000 mg product/L_{nom} is used for risk assessment in consistence with the EU assessment. Additionally, the LOEC is expressed as mean measured concentration: LOEC = 934 mg product/L_{mm} (≙ 84 mg a.s./L_{mm}).

IIA 8.9 Effects on earthworms and other soil macro-organisms

IIA 8.9.2 Sublethal effects on earthworms

KIIA-8.9.2/01 - Winkelmann, G. (2013a)

Reference:	KIIA-8.9.2/01, Benzoic acid - Earthworm (*Eisenia fetida*), Effects on Reproduction according to OECD-Test Guideline 222, Version dated 23 Nov 2004
Author(s), year:	Winkelmann, G. (2013a)
Report/Doc number:	Project-No. 130611DH / Study-No. RBR15572
Guidelines:	OECD Guideline222 (2004)
GLP:	Yes
Deviations:	No
Validity:	Yes

Executive Summary

Effects of Benzoic acid (Batch no. BCBK2035V) on mortality, biomass and the reproductive potential of the earthworm species *Eisenia fetida* (Annelida, Lumbricidae) were determined according to the Guideline OECD 222 (2004). The study was conducted under static conditions over 8 weeks with the test item concentrations 24 - 48 - 96 - 192 - 384 mg Benzoic acid/kg soil dry weight, which were mixed into artificial soil containing 5% peat and a control using untreated artificial soil. 80 test organisms were inserted into 8 control replicates and 40 test organisms were divided into 4 replicates for each treatment (10 earthworms per replicate). They had an individual body weight between 0.33 and 0.60 g at experimental starting.

After 28 days of exposure in soil, no evident earthworm mortalities (< 10%) as well as no pathological symptoms or changes in the behaviour of adult earthworms were observed in all treatments. In all test item concentrations the biomass increases of the adult earthworms were not statistically significantly different compared to the control after the first 28 days. After further four weeks the reproduction rate (average number of juveniles produced) was 58 in the control and ranged between 61 and 83 in the test item concentrations. Compared to the control, the reproduction rates were not statistically significantly different in the test item concentrations 24 to 384 mg Benzoic acid/kg soil dry weight.

Overall, the NOEC of the test item concerning mortality, biomass and reproduction of earthworms was determined to be 384 mg Benzoic acid/kg soil dry weight and the LOEC was determined to be > 384 mg Benzoic acid/kg soil dry weight. EC_{50}-values for biomass and reproduction were not calculated since no reduction of body weight and reproduction occurred at the application rates.

All validity criteria recommended by the test guideline were fulfilled.

Comments of zRMS:	The zRMS consideres the study valid and acceptable.

	The reported NOEC of 384 mg Benzoic acid/kg soil dry weight is used in the risk assessment.

IIA 8.9.3 Effects of other soil non-target macro-organisms

KIIA-8.9.3/01 - Bruhnke, C. (2013)

Reference:	KIIA-8.9.3/01, Benzoic acid - Collembolan (Folsomia candida) Reproduction Test in Soil, acc. to OECD 232 (2009), Verison dated 2009
Author(s), year:	Bruhnke, C. (2013)
Report/Doc number:	Project-No. 130611DH / Study-No. ICR15572
Guidelines:	OECD 232 (September 2009)
GLP:	Yes
Deviations:	Yes From the guideline: Due to organizational reasons, the soil moisture and addition of food was on day 13 instead on day 14 of the study. Due to technical reasons during the adaption phase, the temperature decreased to 17.5°C (total time < 18°C = about 3 hours). Due to technical reasons during the exposure phase, the temperature decreased to 16°C (total time < 18°C = about 65 hours). At the test item rate 143 mg/kg DW the soil moisture was slightly outside of the demanded range of 40 - 60% of WHC. At test start the soil moisture was 62.7% and decreased to 61.0% until day 13. At test end the soil moisture was 58.4%. From the study plan: Test conditions (temperature and soil moisture): See deviations described under "DEVIATIONS FROM THE GUIDELINE". The juveniles were separated from the remaining eggs after two days instead of three days. The results of the control support that these deviations have no impact on quality and integrity of the study as the control replicates were subject to the same test conditions (excluding to the test item rate 143 mg/kg DW, with slightly increased soil moisture (application method 1)) and fulfil the validity criteria. It is assumed that the slightly increased soil moisture at the test item rate 143 mg/kg DW had no impact on quality and integrity of the study.
Validity:	Yes

Executive Summary

The effects of Benzoic acid on the reproduction of *Folsomia candida* in artificial soil were determined in a laboratory study (OECD 232). The aim of the test was to determine the effects of the test item on mortality and reproduction of *Folsomia candida* in artificial soil (5% peat) by cutaneous and alimentary uptake.

The pre-tests revealed that the solubility of the test item was only reached when buffer solutions were used. Since it is not clarified whether buffer solutions can be used according to the guideline it was decided to incorporate the test item as test item - quartz sand mixture once at experimental starting into the artificial soil with the test item rates of 4.20 - 7.56 - 13.6 - 24.5 - 44.1 - 79.4 - 143 - 257 mg/kg DW (factor 1.8). For this, the test item was blended with quartz sand (1% of the entire soil (DW) amount per rate) and the test item - quartz sand mixture was mixed into the soil. As control artificial soil with an additional amount of 1% quartz sand but without test item was used.

Furthermore, for comparability purposes the test item rates 13.6 - 44.1 - 143 - 257 mg/kg DW including a control were tested in parallel using buffer solution of pH 7 (NaOH 0.1 mol/L + KH2PO4 0.1 mol/L) as solvent for the test item. At experimental starting a respective aliquot of the test item buffer stock solution was mixed into the soil for each application rate. As control artificial soil with buffer solution without test item was used.

After application, ten juvenile *Folsomia candida* (10 days old) were placed onto the artificial soil of each replicate. 8 replicates for the controls and 4 replicates for the test item rates were tested. During exposure, springtails were fed with granulated organic dry yeast. After 28 days, adult mortality and reproduction were assessed.

Mortality: A statistical analysis of the mortality data was not conducted. According to OECD 54 it is indicated to use stepdown trend tests (e.g. Jonkheere, Cochran-Armitage) for the statistical evaluation. This software was not available at the assigned test facility.

Application method 1 - Test item mixed with quartz sand: The LC_{50}-value could not be calculated as mean corrected mortality of all test item rates was ≤ 29.4% and was determined to be > 257 mg/kg DW. The LC_{10}- and LC_{20}-value could not be calculated due to the fluctuating mortality results within the concentration range.

Application method 2 - Test item dissolved in buffer pH 7: The LC_{50}-value could not be calculated as mean corrected mortality of all test item rates was ≤ 36.0%. The LC_{10}- was determined to be 186 mg/kg DW and the LC_{20}-value 225 mg/kg DW.

Reproduction: Application method 1 - Test item mixed with quartz sand: EC_{10}-, EC_{20}- and EC_{50}-value could not be calculated and were determined to be > 257 mg/kg DW as mean inhibition of reproduction at all test item rates was ≤ 4.21%. No statistically significant inhibition of reproduction could be observed up to a test item rate of 257 mg/kg DW (ANOVA, p = 0.05).

Application method 2 - Test item dissolved in buffer pH 7: EC_{20}- and EC_{50}-value could not be calculated as mean inhibition of reproduction at all test item rates was ≤ 15.6%. They were determined to be > 257 mg/kg DW, each. EC_{10}-value was determined to be 200 mg/kg (CI : 132 - > 257 mg/kg). A statistically significant inhibition of reproduction could be observed at the test item rate 257 mg/kg DW (ANOVA, DUNNETT'S METHOD, p = 0.05).

Comments of zRMS:	The zRMS consideres the study valid and acceptable.

	The NOEC of 143 mg Benzoic acid/kg soil dry weight is used in the risk assessment.

IIA 8.10 Effects on soil microbial activity

IIA 8.10.1 Laboratory test to investigate impact on soil microbial activity

KIIA-8.10.1/01 - Winkelmann, G. (2013b)

Reference:	KIIA-8.10.1/01 Benzoic acid - Soil Micro-Organisms: Nitrogen Transformation Test according to OECD-Test Guideline 216
Author(s), year:	Winkelmann, G. (2013b)
Report/Doc number:	Project-No. 130611DH / Study-No. TBN15572
Guidelines:	Yes OECD Guideline 216 (2000)
GLP:	Yes
Deviations:	The soil was stored at 6 ± 2 °C instead of 4 ± 2 °C due to organisational reasons. This deviation is considered to have no impact on the quality and integrity of the study.
Validity:	Yes

Executive Summary

The effects of Benzoic acid (batch no. BCBK2035V) on the metabolic activity of soil micro-organisms were determined according to OECD Guideline 216 (2000) at DR.U.NOACK-LABORATORIEN, 31157 Sarstedt, Germany, from 2013-09-10 to 2013-10-09, with a definitive exposure phase from 2013-09-10 to 2013-10-08.

The test item was incorporated at a maximum concentration of 38.4 mg/kg soil dry weight corresponding to a maximum application rate of 28.8 kg Benzoic acid/ha and 192 mg/kg soil dry weight corresponding to 5 times maximum application rate of 144 kg Benzoic acid/ha. The conversion from kg/ha to mg/kg is based on a soil density of 1.5 g/cm³ and a soil layer of 5 cm. Untreated silty sand soil was tested as control.

The effects of the test item on the metabolic activity of the nitrogen-N formation rate (nitrate) were measured on the day of treatment (day 0) and subsequently after 7, 14 and 28 days.

Benzoic acid did not affect the microbial nitrate formation rate (differences < 25 %) after 7, 14 and 28 days when applied at 38.4 mg/kg dw soil and 192 mg/kg dw soil. The obtained results indicate that Benzoic acid is not expected to cause any long term detrimental effects on nitrogen turnover in soil under normal conditions.

Table 8.10.1-1 Inhibition of Inorganic-N Formation Rates

Nitrate-N Formation Rate			
Test item concentration [mg/kg soil dry weight]	Inhibition [%] compared to control		
	7 d	14 d	28 d
38.4	18	14	1
192	18	7	7

positive values = inhibition negative values = increase

Comments of zRMS:	The zRMS consideres the study valid and acceptable. The concentration of benzoic acid which is considred not causing any long term detrimental effects on nitrogen turnover in soil under normal conditions is 192 mg a.s./kg soil d and is used in the risk assessment.

Appendix 3 Table of Intended Uses justification and GAP tables

GAP- table of intended uses for all cMS (without Germany) not verified by ZRMS

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance 1	**-**	**Conc. of as 1:**	**-**
active substance 2	**-**	**Conc. of as 2:**	**-**
active substance	**Benzoic acid**	**Conc. of as:**	**90 g/L**
safener	**no**	**Conc. of safener:**	**n.a.**
synergist	**no**	**Conc. of synergist:**	**n.a.**
Applicant:	**MENNO Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**Northern + Central + Southern/EU**	**non professional use**	☐

Verified by MS: no

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
1	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Bacterial harmful organisms, Fungal harmful organisms	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
2	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Bacterial harmful organisms, Fungal harmful organisms	watering	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
3	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Bacterial harmful organisms, Fungal harmful organisms	flooding	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
4	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Viruses and viroids	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
5	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Viruses and viroids	watering	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
6	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces		Viruses and viroids	flooding	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
7	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Bacterial harmful organisms, fungal harmful organisms, Viruses and Viroids	Dipping	n.a.	a) 1 b) not relevant	not relevant	not relevant	not relevant	not relevant	4 % - 3 min. No direct treatment of plants, soil or substrates. Only for disinfection.

n.a. = not applicable

Remarks:
(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
(d) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) GCPF Codes - GIFAP Technical Monograph No 2, 1989
(f) All abbreviations used must be explained
(g) Method, e.g. high volume Coarse Spraying, low volume Coarse Spraying, spreading, dusting, drench
(h) Kind, e.g. overall, broadcast, aerial Coarse Spraying, row, individual plant, between the plants - type of equipment used must be indicated
(i) g/kg or g/l
(j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(k) The minimum and maximum number of application possible under practical conditions of use must be provided
(l) PHI - minimum pre-harvest interval
(m) Remarks may include: Extent of use/economic importance/restrictions

REGISTRATION REPORT
Part B

Section 6: Ecotoxicological studies
Detailed summary of the risk assessment

Product code: **MENNO FLORADES**

Active Substance: **Benzoic acid 90 g/L**

Central Zone
Zonal Rapporteur Member State: Germany

NATIONAL ADDENDUM

Applicant: **MENNO Chemie-Vertrieb GmbH**

Date: **01/08/2017**

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Sec 6 ECOTOXICOLOGICAL STUDIES (MIIIA 10)

The exposure assessment of the plant protection product MENNO Florades in its intended uses in protected rooms is documented in detail in the core assessment of the plant protection product MENNO Florades dated from October 2016 performed by Germany.

6.1 Proposed use pattern

Full details of the proposed uses that will be assessed is included in Appendix 2.

The intended uses in Germany are covered by the core assessment.

6.2 National risk assessment

Usually the german risk assessment differs from the core assessment in terms of the models and parameters used.

Considering the outcome of the core assessment, the magnitude of exposure and the characteristics of the active substance, a specific risk assessment for Germany is not deemed necessary.

Appendix 1 List of data submitted in support of the evaluation

No additional data for national assessment submitted.

Appendix 2 Table of Intended Uses in Germany (according to BVL 2015-08-12)

GAP-Table of intended uses for Germany

GAP rev. (4), date: 2015-08-12

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance	**benzoic acid**	**Conc. of as :**	**90.00 g/L**
Applicant:	**Menno-Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**central EU**	**non professional use**	☐

Verified by MS: yes

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** (crop destination / purpose of crop)	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**			**Application rate**			**PHI** (days)	**Remarks:** e.g. safener/synergist per ha; e.g. recommended or mandatory tank mixtures
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product/ha spray volume L/m², exposure time/ concentration	g as/ha g as/m²	Water L/ha min / max		
001	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%:			The exposure time is specific to the pathogen and can be reduced, if necessary.

					of the plants			exposure time 16 hours: 1 % exposure time 4 hours: 2%	0.72 g as/m² 2%: 1.44 g as/m²			*surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
002	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *standing areas and vessels - for disinfection -
003	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
004	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								- harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			
005	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%:			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								- harmful organisms difficult to inactivate: 4 %	2.88 g as/m²			
006	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
007	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

008	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
								exposure time 16 hours: 1 % exposure time 4 hours: 2%				
009	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
								exposure time 16 hours: 1 % exposure time 4 hours: 2%	 2%: 1.44 g as/m²			
010	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
								exposure time 16 hours: 1 % exposure time 4 hours: 2%	 2%: 1.44 g as/m²			
011	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct	after the last use or before each reuse and after	1	80 or 160 or 320 L/ha	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary.

					treatment of the plants	thorough mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			* surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
012	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
013	DE	vegetables NNNVV	G* I*	viruses BXXXXX** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
014	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

015	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
016	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
017	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
018	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming	after the last use or before each reuse and after	1	80 or 160 or 320 L/ha	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and

					no direct treatment of the plants	thorough mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
019	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
020	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
021	DE	potato SOLTU (reproductive material)	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

022	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
023	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
024	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
025	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	spraying or foaming,	after the last use or before each reuse and after	1	80 or 160 or 320 L/ha	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and

					no direct treatment of the plants	thorough mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
026	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
027	DE	tobacco NIOTA	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
028	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

** no EPPO-Code

Remarks:
(1) Numeration of uses in accordance with the application/as verified by MS
(2) Member State(s) or zone for which use is applied for
(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided
(8) Min. interval between applications (days) were relevant
(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)
(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)
(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.

REGISTRATION REPORT

Part B

Section 7: Efficacy Data and Information

Detailed Summary

Product Code: MENNO Florades

Reg. No.: 034407-00/00

Active Substance: 90 g/L Benzoic Acid

All EU Zones

Zonal Rapporteur Member State: Germany

CORE ASSESSMENT

Applicant: MENNO Chemie-Vertrieb GmbH

Date: July 2014
(Update because of shortening the GAP)

Evaluator: Julius Kühn-Institut

Date: 2017-08-01

Table of Contents

The following data and information were mainly provided by the applicant submitted as dRR and BAD. Additional comments and the final evaluation by the zRMS in this Registration Report are marked by green boxes.

IIIA1 6 Efficacy Data and Information on the Plant Protection Product

General information on the formulation

Trade names: MENNO Florades, MENNO CLEAN, Menno Florades 90 SL and other.

MENNO Florades is used as disinfectant (fungicide, bactericide, virucide) in agriculture and horticulture.

Content of active substances	90 g/L Benzoic acid
Formulation type	soluble liquid, miscible with water [SL= soluble concentrate]

MENNO Florades is intended for disinfection of standing areas, surfaces, equipment, and container in storage and processing rooms. Additionally it is used for the preventive treatment of small tools i.e. knives and other cutting tools:

- Floriculture: standing areas, surfaces, ebb/flood benches, culture vessels, knives, gardening equipment; only onto hard surfaces, **no direct application on plants**

- Agriculture (potatoes and tobacco): standing areas, surfaces (storage rooms, culture rooms, machine shops, machinery, equipment, container; only onto hard surfaces, **no direct application on plants/crops**)

- Horticulture (fungal/mushroom growing, vegetables (seedling production), root and tuber vegetables, brassica vegetables, bulb crops: standing areas, surfaces (storage rooms, culture rooms, machine shops, machinery, equipment, container; only onto hard surfaces, **no direct application on plants/crops**)

For full details of all uses please refer to Appendix 2.1 and Appendix 2.2 of this document (table of intended uses).

Comparability of intended uses between Germany and other member states

Since there is no direct treatment on plants or plant products, and the product is a disinfectant on surfaces and tools, the biological assessment dossier has been structured according to the pests and not according to the crop. This is reflected also in the GAP provided under point 2.3, product uses.
For Germany, cultures have to be listed separately, therefore the GAP is extended compared to the "EU-GAP", although the same uses are intended. The GAP for Germany is attached as Appendix 2.2.

Recent registration situation/history of the PPP

In all countries the formulation is the same (SL, containing 90 g benzoic acid/L). In part of the countries the trade name is slightly different.

Table 6- 1: Recent registration situation in the EU

Country	Tradename	Authorisation No.	Registered rate(s)	Expiry date	Use(s)
AT	Menno-Florades	2753	1-4%	31/12/2014	MENNO Florades is used as disinfectant, (fungicide, bactericide, virucide) in agriculture and horticulture
BE	MENNO CLEAN	024407-00	1-4%	31/12/2014	
CH	Menno Florades		1-3%	31/07/2015 Re-registration applied.	
DE	MENNO Florades		1-4%	31/12/2014	
FI	MENNO Florades	1913	1-4%	31/12/2013	
HR	Menno Florades		1-4%	08/07/2021	
HU	MENNO-FLORADES		1-4%	31.12.2022	
LV	Menno Florades š.k.		1-4%	21/04/2015	
NL	MENNO CLEAN		1 %	31/05/2014 Due to the authorities, re-registration is foreseen before expiry date until 31.01.2017.	
PL	Menno Florades 90 SL		1-4%	25/11/2019	
UK	MENNO Florades	13985 15091	80 ml/m2	31.07.2019	

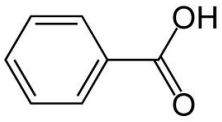
Physical chemical properties of the formulation

Formulation type (GIFAP Code)	SL
Appearance	Amber coloured liquid with a slightly alcoholic and acidic odour
Explosive properties	Not expoloive
Oxidative properties	Not oxidizing
Autoflammability	Auto-ignition at 435°C
Flashpoint	28°C
pH 1 % solution	2.64
Surface tension	53.4 nM/m
Viscosity	6.9 mPa.s
Relative density	D204 = 1.0
Storage stability / Shelf life / Packaging	Stable for at least 2 years at 20°C Stapble for at least 14 days at 54°C Stable for at least 7 days at 0°C
Content active substance (g/l or g/kg)	90 g/l pure a.s.
Physical and chemical compatibility	No mixing is proposed

Information on the active ingredient

This document summarises the information related to the efficacy of the plant protection product MENNO Florades containing the active substance Benzoic acid which was included into Annex I of Directive 91/414 (Commision Directive 2004/30/EC of 10 March 2004) and further approved according to Implementing Regulation (EU) No. 540/2011.
The expiry date of benzoic acid has been further extended to 31 January 2017 according to Commission regulation (EU) No. 823/2012.

The SANCO report for Benzoic acid (SANCO/1396/2001-Final dated 28/11/2001) is considered to provide the relevant review information:

Common name (ISO, IUPAC, CA)	Benzoic acid
CAS No	65-85-0
EEC No	EINECS: 2006182
Minimum purity	990 g/kg
Molecular formula	C7H6O2
Molecular mass	122.12
Structural formula	
Appearance	white odourless crystalline solid
Solubility in water	2.9 g/l
Partition co-efficient (log Pow)	log Pow = 1.87
Hydrolytic stability (DT50)	stable
Flammability	Ignition temperature in air: 573 °C
Explosive properties	not explosive
UV/VIS absorption (max.)	not relevant
Photostability in water (DT50)	not relevant

Uptake and Mode of action

Benzoic acid is described as non-specific inhibitor. The undissociated acid is effective against microbes. Benzoic acid (uncharged, undissociated and freely permeable across the plasma membrane) enters the cell (by passive diffusion; only in its undissociated state, the acid is able to pass the cells membrane) and dissociates. Charged anions and protons are released and accumulate inside the cell. Benzoic acid molecules diffuse into the cell according to the pH gradient (until equilibrium is reached). The molecules remain inside the cell, because the resulting ions cannot pass the membrane. The accumulation of charged ions results in membrane disruption, inhibition of essential metabolic reactions (uncoupling of both substrate transport and oxidative phosphorylation from the electron transport system, inhibition of citric acid cycle) homeostatic stress, and accumulation of toxic anions. In yeast the induction of stress response by benzoic acid is reported, resulting in the reduction of available energy pools.
Because all modes of action are non-specific, benzoic acid is effective against a broad range of pathogenic and non-pathogenic bacteria, fungi, viruses and viroids.

Information on the intended uses:

No direct application on plant in any of the intended uses following, but on flower pots, trays, transport container, benches and storage rooms, cultivation rooms, greenhouses etc.

Plant disease to occur, three factors are required. They are: 1) a susceptible host (i.e. ornamental plant); 2) a plant pathogen (fungus, bacterium, virus, or nematode); and 3) an appropriate environment to allow the pathogen to infect the susceptible host. If all three of these conditions are met plant disease will occur. The elimination of any one or more corners of the disease triangle will effectively eliminate plant disease. Rigid sanitation measures, are of vital importance in effectively removing plant pathogens. By demanding such sanitation measures, potential diseases are eliminated or minimized.

Floriculture: Ornamentals
Diseases represent a serious hazard to the production of a quality ornamental crop. Control of ornamental diseases should be based on disease prevention because once disease producing organisms invade plant tissue, control is much more difficult and expensive and frequently not too successful.

Bacterial and fungal pathogens are most commonly involved in damage to commercial ornamental production. Ornamental diseases and subsequent plant losses due to the pathogens cause damage and monetary loss. Both bacteria and fungi are microscopic in most forms and because of this, it is impossible to detect their presence until plant infection and subsequent plant deterioration occurs. Therefore, it is important to anticipate potential disease problems and to modify the greenhouse environment or initiate preventive chemical control to minimize plant loss to disease.

General greenhouse sanitation is therefore of vital importance in an overall disease control program in ornamental crop growing.

Horticulture: Vegetables crops
Also in the vegetable production of tomatoes, cucumbers, lettuce, onions, cabbage, etc. finds GLOBALG.A.P. (formerly EUREPGAP, a common standard for farm management practice created in the late 1990s by several European supermarket chains and their major suppliers) its way, with the result that to the industrial hygiene great importance is attached against notifiable pathogens such as *Ralstonia*, *Clavibacter* (*Corynebacterium*), PepMV, PSTVd etc. but also against economically important pathogens such as *Erwinia* or *Bortrytis*. In order to minimize the spread of potential pathogens, disinfection of rooms, machinery, equipment and tools plays an essential role here as well.

Horticulture: Mushroom production
The production of mushrooms, oyster mushrooms, shiitakes, etc. is subject to crop protection. As a consequence, disinfection against bacteria, as *Pseudomonas*, virus and pathogenic fungi as *Trichoderma*, *Verticillium* und *Dactylium* has to be done. Bacteria, viruses or harmful fungi cause almost always a deformation of the fruit body and can lead to complete crop failure. Many pests can infest mushrooms. As a preventive, the correct management of the culture plays an important role. This includes especially the proper observance of hygiene. Since only a small number of chemical pesticides are authorized in the mushroom cultivation, a hygienic cultivation is of particular importance.

Agriculture: Potatoes

Several of the common storage diseases naturally occur in the soil. As a result they are transported with the tubers into storage rooms. The equipment and storages are exposed to a number of pests including fungi, bacteria, insects, nematodes, and weed seeds. Many of these pests can be spread from tuber to tuber or field to field on equipment or in storage and cause problems in future crops if not eliminated or at least minimized. Since potato pathogens can survive very long times in potato storages, it is important not only to clean and dry the tubers and control the climate conditions while storage (also important for healing wound areas to minimize pathogen penetration), but also to minimize the pathogen occur in general, particular for quarantine pests (e.g. *Clavibacter michiganensis subsp. Sepedonicus*, the poato spindle tuber viroid, potato black ringspot nepovirus).

Agriculture: Tobacco
In the cultivation of tobacco, it is necessary to control pathogene fungus as *Peronospora* (so far can be controlled only by the prophylactic use of fungicides and crop rotation in which tobacco is grown again on the same area at the earliest after three years), *Chalara* and others, but also various viral diseases in particular tobacco mosaic virus. Especially in case of viral diseases the situation is severe since there are no authorized disinfectants available.

Information on pests

MENNO Florades is intended for disinfection of standing areas, surfaces, equipment and container in storage and processing rooms. Subsequently details of the harmful organisms against which protection is afforded are listed (bacteria: table 6- 2, fungi: table 6- 3 and viruses and viroids: table 6- 4). Some examples of diseases are discussed in more detail.

Bacteria
Sources: Moorman, G. 2013[1]

Plant pathogenic bacteria generally survive in infected plants, in debris from infected plants, and in a few cases, in infested soil. Most require a wound or natural opening in the plant to gain entry and require warm, moist conditions in order to cause disease. Bacteria grow between plant cells on the nutrients that leak into that space or within the vascular tissue of the plant. Depending on the species of bacteria involved and the tissue infected, they release enzymes that degrade cell walls, toxins that damage cell membranes, growth regulators that disrupt normal plant growth, and complex sugars that plug water conducting vessels. In most bacterial diseases, photosynthesis and respiration are severely altered to the detriment of the plant.

Bacteria reproduce very rapidly. They are splashed easily from the soil to the leaves and from leaf to leaf by overhead irrigation. They are also easily moved from soil or debris when a worker handles such material and then handles the live plant.

Besides other measures the strict sanitation practices required to control bacterial diseases include the destruction of infected plants as well as cleaning and disinfesting, tools, benches, flats, and pots that are used repeatedly.

[1] http://extension.psu.edu/pests/plant-diseases/all-fact-sheets/bacterial-diseases-of-ornamentals

Once disease begins on the plants, chemical control is not effective. Although research reports may indicate 80 to 90% control with chemicals under experimental conditions, often less than 50% control is achieved under commercial conditions with chemicals.

Examples:
Erwinia chrysanthemi and *Erwinia carotovora* survive in plant debris that is not completely decomposed, on or in infected plants, on other greenhouse plants without causing disease, and under some conditions, in soil. Both species infect a wide range of plants in the greenhouse. *E. chrysanthemi* has been shown to survive on plants that it does not actually infect. They can cause a mushy, brown, smelly, soft rot or leaf spots.

Pseudomonas cichorii can cause leaf spots and blights on chrysanthemum, geranium, impatiens, and many other ornamental plants. The spots are generally water-soaked (wet-looking) and dark brown to black. Depending upon the plant infected, the leaf spots may have a yellow halo.

Xanthomonas is another genus of bacteria containing important plant pathogenic species. *Xanthomonas campestris* pv. *pelargonii* causes bacterial blight or wilt of geranium. Other species of *Xanthomonas* attack Dieffenbachia, Philodendron, Syngonium, Aglaonema, and other foliage plants.

Rhodococcus fascians (formerly Corynebacterium) causes abnormal branching and stem development near the base of infected plants such as geranium. The bacterium is carried on infected cuttings and may enter the propagation medium.
Ralstonia solanacearum (formerly Pseudomonas) causes vascular wilting of many herbaceous ornamentals, including geraniums. Gross symptoms in geraniums mimic those of bacterial blight caused by *Xanthomonas campestris* pv. *pelargonii*. Unlike most other bacteria, *Ralstonia solanacearum* survives well in the soil. Once a greenhouse is contaminated with this organism, it is difficult to eliminate and poses a threat to many different crops. Symptoms include leaf wilting, discoloration of the vascular tissue, leaf yellowing and death of the plant.

Table 6- 2: Details of harmful bacteria against which protection is afforded by MENNO Florades

Bacteria	EPPO-Code	Potential infected plants	Additional information
Acidovorax avenae ssp. *cattleyae* (= *Pseudomonas cattleyae*)	ACVRAC	Potatoes, plantain	Causes bacterial fruit blotch, which can cause 100% loss of marketable fruit
Acidovorax	1ACVRG	Lettuce, fruits, vegetables, ornamentals, potatoes, tobacco, cereals	Genus of Proteobacteria. All species are aerobic.
Agrobacterium tumefaciens	AGRBTU	Fruit trees, grape vine, rhododendron	The DNA transmission capabilities of *Agrobacterium* have been vastly explored in biotechnology as means of inserting foreign genes into plants.
Clavibacter michiganensis	CORBMI	Vegetables, sunflower, ornamentals, tabacco, cereals	The bacterium is subject to quarantine and zero-tolerance importation policies in many nations. *Clavibacter michiganensis* subsp. *sepedonicus* is a high profile alien plant pathogen of A2 Quarantine status affecting only potatoes.
Clavibacter michiganensis ssp. *michiganensis*	CORBMI		
Clavibacter michiganensis ssp. *sepedonicus*	CORBSE		
Erwinia amylovora	ERWIAM	Fruits, vegetables, ornamentals, potatoes, tabacco, cereals	The disease is believed to be indigenous to North America, from where it spread to most of the rest of the world.
Erwinia carotovora pv.	ERWIAT		Both cause decay of potato stems and tubers. *E.*

Bacteria	EPPO-Code	Potential infected plants	Additional information
atroseptica			*carotovora pv. atroseptica* is usually associated with the blackleg disease of potato stems, in which the infection originates from the seed piece, whereas stem decay initiated by *E. carotovora pv. carotovora normally begins at a wound site in the aboveground portion of the plant.*
Erwinia carotovora pv. carotovora	ERWICA		
Pseudomonas lachrymans	PSDMLA	Potato, tomato	Pathogen is seed-borne and infects the cotyledons during germination
Pseudomonas solanacea-rum (= Ralstonia solanacea-rum)	RALSSO		Soilborne bacterial pathogen that is a the causal agent of brown rot of potato, bacterial wilt or southern wilt of tomato, tobacco, eggplant, and some ornamentals, and Moko disease of banana.
Pseudomonas syringae	PSDMSX		Exists as over 50 different pathovars.
Pseudomonas solanacea-rum (= Ralstonia solanacea-rum)	RALSSO	Potatoes, ornamentals (geranium), tobac-co,tomato	*R. solanacearum* is soil-borne pathogen. It colonises the xylem, causing bacterial wilt in a very wide range of potential host plants. Bacterial wilts of tomato, pepper, eggplant and Irish potato caused by *Ralstonia solanacearum* were among the first diseases that were proved to be caused by a bacterial pathogen.
Xanthomonas axonopodis pv. begoniae (= Xanthomonas cam-pestris pv. begoniae)	XANTBE	Begonias and hybrids	Causes Bacterial Leaf Spot. *X.campestris pv. begon-iae* can survive in dried leaves for up to one year and may survive on foliage for several months.
Xanthomonas campestris pv. pelargonii	XANTPE	Pelargoniums and hy-brids	Causes the bacterial blight of geranium which is the single most important disease of *Pelargonium* sp. It can cause disease in all cultivated pelargonium varie-ties. This disease is widespread in various states of the United States and in Europe, Australia, and Israel and may cause heavy losses, particularly where geranium cuttings are propagated on a large scale.

Fungi

Example: Botrytis

Source: Department of Crop Sciences. University of Illinois at Urbana-Champaign[2]

Botrytis blight or gray mold, one of the most common and destructive diseases of greenhouse-grown crops, is estimated to cause a greater economic loss of ornamentals and vegetables than any other disease. Botrytis blight causes damage on many fruits and vegetables and can be a serious problem during both short- and long-term cold storage and subsequent shipment of most types of horticultural commodities.

The causal fungus can invade and damage many plant parts including flowers, pedicels, stems, leaves, buds, fruits, bulbs, corms, tubers, and roots. With some exceptions, however, Botrytis blight mainly attacks tender tissues (flower petals, buds, or seedlings), weakened or injured tissues (such as stubs or bases left on stock plants after cuttings), and aging and dead tissues. Actively growing tissues, other than flower petals, are seldom invaded. Blight is the most common symptom, however, fruit, vegetable, tuber, stem, corm, and bulb rot and leaf spot or blotch are also symptoms of Botrytis infection.

There are some 50 species of *Botrytis*, accounting in part for the wide range of plants and plant parts affected. *Botrytis cinerea* has by far the largest host range of any species of *Botrytis*, It should be remem-

[2] http://web.aces.uiuc.edu/vista/pdf_pubs/623.PDF

bered that most ornamental plants, even if not officially recorded as hosts, are probably susceptible to one or more species of *Botrytis* under the right circumstances.

Botrytis cinerea causes blossom blight, bud rot, stem canker, stem and crown rot, cutting rot, leaf blight, and damping-off or seedling blight. Botrytis infection first appears as a water-soaking and browning regardless of the tissue affected. A conspicuous, tan to gray fuzzy mold (composed of many thousands of spores borne in grapelike clusters) develops on rotted tissue under humid conditions. Flag to roundish, black resting bodies (sclerotia) of the fungus can appear on infected and sporulating tissue as the plant or plant part dies.

Table 6- 3: Details of harmful fungi against which protection is afforded

Fungi	**EPPO-Code**	**Potential infected plants**	**Additional information**
Alternaria sp.	ALTESP	Fruits, vegetables, potato, ornamentals, tabacco, cereals	*Alternaria* species are major plant pathogens but also common allergens in humans, growing indoors and causing hay fever or hypersensitivity reactions that can lead to asthma.
Aspergillus sp.	ASPESP	Fruits, vegetables, ornamentals, tabacco, cereals, nuts, lawn	Consisting of several hundred mold species found in various climates worldwide.
Botrytis sp.	BOTRSP	Fruits, vegetables, potato, ornamentals, tabacco, cereals	*Botrytis cinerea* causes Grey mould and does not only infect plants, it also hosts several mycoviruses itself.
Botrytis cinerea	BOTRCI		
Cercospora beticola	CERCBE	*Beta* (esp. sugar beet)	Cercospora leaf spot caused by *C. beticola* is considered to be the most destructive foliar pathogen of sugarbeet in the world.
Chalara elegans	THIEBA	Tabacco	*Thielaviopsis basicola* (syn. *Chalara elegans*) causes the black root rot.The fungus can infect a wide range of hosts, including plants from at least 15 families, and can be found all over the world. It is a particular problem in bedding plants.
Colletotrichum sp.	COLLSP	Fruits, vegetables, potato, ornamentals, tabacco, cereals	Colletotrichum species with are known as anthracnose pathogens of a number of economically important hosts and was first describesd in Czech Republic in 1831.
Cylindrocladium scoparium (Anamorph from *Calonectria kyotensis*)	CALOKY	Ornamentals, plum	*Cylindrocladium scoparium* has become a widespread and major pathogene in *Rhododendron* spp. and *Azalea* spp. as well as in *Erica gracilis*, *Erica carnea, Calluna vulgaris* and *Gaultheria procumbens*.
Cylindrocladium spathiphylli	CYLDSQ	Ornamentals	It causes reddish-brown lesions on the roots which grow rapidly causing a total root collapse and later rot. Probably the most common disease affecting *Spathiphyllum* production.
Dactylium dendroides	DACYDE	Potato, ornamentals	*Dactylium dendroides* is the conidial state of *Hypomyces rosellus* and causes cobweb disease (can be caused by a number of different but related fungi). Cobweb disease has become common and a serious cause of crop loss not only in Europe but also in the USA and Australia.

Fungi	EPPO-Code	Potential infected plants	Additional information
Didymella bryoniae	DIDYBR	Cucurbitaceae	Causes gummy stem blight and black rot and can cause significant production losses when conditions are ideal for the spread of this fungal pathogen.
´Erikenpilz´	no EPPO-code available	Erica	As cryptosporiopsis-variaty specified; no teleomorph proved until now; located only in the root.
Erysiphe cichoracearum	ERYSCI	Cucurbitaceae, vegetables, tobacco, *Impatiens*	Causes powdery mildew disease of cucurbits and other crops.
Fusarium oxysporum (from Begonia elatior)	FUSAOX	Ornamentals, vegetables, cereals, potato, banana	Plant pathogenic *F. oxysporum* strains have a broad host range; individual isolates usually cause disease only on a narrow range of plant species. Some species produce mycotoxins in cereal crops (fumonisins and trichothecenes) that can affect human and animal health if they enter the food chain.
*Fusarium oxysporum f.*sp. *cyclaminis*	FUSAOX		
Fusarium solani var. coeruleum	FUSASC		
Fusarium sp.	FUSASP		
Helminthosporium solani	HELMSO	Potato	Known to cause Silver Scurf on potato. It is thought to be of greatest economic importance in areas that possess temperate climates where tubers stored for extended periods of time.
Mucor sp.	MUCOSP	Fruits, vegetables, potato, sugar beets, ornamentals, tobacco, cereals	Microbial genus of approximately 3000 species of moulds commonly found on plant surfaces, in rotten vegetable matter and soil.
Ophiostoma quercus	CERAPC	Oak	First described in 1926 from oak in the former Yugoslavia and has been implicated as a causal agent of oak decline in Central Europe.
Penicillium sp.	PENISP	Fruits, vegetables, potato, cereals	Affect the fruits and bulbs of plants. *Penicillium expansum* is one of the most prevalent post harvest rots that infect apples.
Peronospora hyoscyami f. sp. tabacina (*syn. Peronospora tabacina*)	PEROTA	Solanaceae (tobacco, eggplant, sweet pepper)	Causes Blue mold of tobacco and is one of the most economically important diseases of tobacco plant. It mostly spreads by distribution of infected transplants.
Phytophthora cinnamomi	PHYTCN	Erica, azalea, rhododendron	It is a soil-borne water mould which causes root rot (dieback). *P. cinnamomi* is one of the world's most invasive species and is present in over 70 countries from around the world.
Phytophthora infestans	PHYTIN	Fruits, vegetables, potato, ornamentals	The most destructive pathogen of solanaceous crop, such as tomato and prevalently potato.
Pythium aphanidermatum	PYTHAP	Vegetables, ornamentals	Soil borne pathogen which has a wide host range. Because it requires warmer temperatures, it is often seen in greenhouses. *Pythium aphanidermatum* conomically important in crops like corn, cotton, cereal crops, and high value horticultural crops, also in crops that are produced both in greenhouses and by soilless culture.
Pythium sp.	PYTHSP		*Pythium*-induced root rot is a common crop disease and is a very common problem in fields and greenhouses. Occurence of affected newly emerged or emerging seedlings is known as damping off.
Ramularia beticola	RAMUBE	Sugar beet	Ramularia leaf spot is one of the most important leaf diseases in sugar beets in northern European countries
Rhizoctonia solani	RHIZSO	Fruits, vegetables, potato, ornamentals, tabacco	First observed and named by Julius Kuhn in 1858; distant relative of the common edible mushroom, *Agaricus*.

Fungi	EPPO-Code	Potential infected plants	Additional information
Rhizopus sp.	RIZPSP	Fruits, vegetables, cereals, ornamentals, potato	*Rhizopus* is a cosmopolitan filamentous fungus found in soil, some species are plant pathogens (e.g. weak parasite on ripe fruit - peach, fig, strawberries, citrus, persimmon, pear, avocado, and melons).
Thielaviopsis basicola	THIEBA	Vegetables, ornamentals, potato, tabacco	*Can* be found in all regions of the world, especially in regions with cool climates.Black root rot can affect a wide range of woody and herbaceous plants.
Trichoderma harzianum Th2	TRCDHR	Fruits, vegetables, ornamentals, potato, tabacco cereals, nuts	***Trichoderma harzianum*** is a fungus and a fungicide. It is used for foliar application, seed treatment and soil treatment for suppression of various disease causing fungal pathogens. BUT ***Trichoderma harzianum*** **biotype TH2** causes the green mold desesase on white mushrooms (*Agaricus bisporus*) cultivation in many countries.
Trichoderma viride	TRCDVI		***Trichoderma viride*** is a fungus and a biofungicide. It is used for seed and soil treatment for suppression of various diseases caused by fungal pathogens. It is also a pathogen in its own right, causing green mould rot of onion.
Verticillium fungicola	VERTFU	Fruits, vegetables, ornamentals, potato	Causes dry bubble disease, an important fungal pathogens of the button mushroom, *Agaricus bisporus.*

Viruses
Example: Tobacco mosaic virus
Sources: Moorman, G. 2013[3]; Hayes, A.J., 2008[4]

Of the over 130 viruses known to infect ornamentals, *Tobacco mosaic virus* (TMV) is the most commonly detected virus. TMV, a member of the genus *Tobamovirus,* is a rigid rod-shaped virus approximately 18 nm in diameter and 300 nm in length. TMV has a very wide host range and is estimated to infect over 350 species of plants. Viral transmission occurs by mechanical means; by contact between plants or by workers physically moving the virus from plant to plant by touching infected plant material. Once inside the plant, the virus' protein coat is removed and the nucleic acid directs the plant cell to produce more viral RNA. TMV virions are exceptionally stable and are able to survive for months outside the host, such as on greenhouse benches, tools, and surfaces. Transmission has also been shown to occur during watering, where the watering can brushed against the plants, and during experimental sampling, if gloves are not changed regularly. Because of its economic importance it is vital for growers and storage owners to control this virus.

Symptoms of TMV on ornamentals include mosaic patterns on leaf tissue, flower color break, stunting, and leaf rugosity. TMV causes immense pecuniary in losses in the floriculture industry annually. Because of the intensity of production of ornamentals and the high plant density, a virus outbreak in a greenhouse can quickly spread and devastate entire crops, rendering them unsalable.

The mechanical nature of viral transmission leads to the risk of spread by cutting tools. Ingreenhouse situations with TMV-infected stock plants used for cuttings, it can be transferred easily from the stock plant to the cutting tool, and thus between infected and healthy stock plants. During vegetative propaga-

[3] http://extension.psu.edu/pests/plant-diseases/all-fact-sheets/tobacco-mosaic-virus-in-greenhouses

[4] Hayes, A.J. (2008): Disinfectants on cutting blades using tobacco mosaic virus on Petunia as a model. Thesis Ohio State University; https://kb.osu.edu/dspace/bitstream/handle/1811/35862/HAYES_AMANDA_THESIS.pdf

tion, multiple cuttings are taken from one mother stock plant and multiple stock plants are commonly used. Disinfesting tools is a critical process in preventing the spread of disease during this process.

Table 6- 4: Details of harmful virus/viroids against which protection is afforded (Tobamoviruses are marked with #)

Virus/Viroids (Species names)	Code used in Tests	EPPO-Code	Potential infected plants	Additional information
Arabis mosaic nepovirus	ArMV	ArMV00	Ornamentals, fruits, vegetables, tobacco, potato	First reported in *Arabis hirsuta*; from England
# Bell pepper mottle tobamovirus	BePMV	no EPPO-code available	Pepper	does not infect tomato, eggplant, or tobacco
Carnation mottle virus	CarMo	CARMOV0	Ornamentals, vegetables	First reported in *Dianthus* spp.; from the U.K.
*#Cucumber mosaic virus**	CMV	CMV000	Vegetables, ornamentals, tobacco, potato	First reported in *Cucumis sativus*; from the U.S.A., host range ca. 85 families
Cymbidium mosaic virus	CyMV	CYMMV0	Ornamentals, cucumber, rice	First reported in *Cymbidium* spp.; from California, U.S.A.
Melon necrotic spot carmovirus	MNSV	MNSV00	Melon, vegetables, tabacco	First reported in *Cucumis melo*; from Japan
#Odontoglossum ringspot virus	ORSV	ORSV00	Ornamentals (esp. orchids), tobacco, beets	First reported in *Odontoglossum grande*; from the U.S.A.
Pepino mosaic potexvirus	PepMV	PEPMV0	Tobacco, potato, tomato	First reported from Peru in Solanum muricatum
Pelargonium flower break virus	PFBV	PFBV00	Ornamentals	First reported in *Pelargonium zonale*; from the U.K.
*Pelargonium leaf curl virus**	PLCV	PLCV00	Ornamentals	First reported *in Pelargonium zonale*; from Germany
# Pepper mild mottle virus	PMMoV	PMMOV0	Sweet pepper, tobacco, Petunia	First reported in *Capsicum annuum*
Potato virus X	PVX	PVX000	Potato, tobacco, thorn apple, cabbage	First reported in *Solanum tuberosum*; from the U.K.
Potato virus Y	PVY	PVY000	Potato, tomato, tobacco, thorn apple	First reported in *Solanum tuberosum*; from the Netherlands
*Ribgrass mosaic virus**	RMV	RMV000	Ornamentals, fruits, vegetables, tobacco, eggplant	First reported in *Plantago lanceolata*; from New Jersey, U.S.A.
*Tomato black ring virus**	TBRV	TBRV00	Vegetables (esp. tomato, potato & beans), ornamentals, tobacco	First reported in *Lycopersicon esculentum*; from the U.K
#Tobacco mosaic tobamovirus (syn. *Tobacco mosaic virus*)	TMV	TMV000	Tobacco, vegetables, ornamentals, potato	First reported in *Nicotiana tabacum*; from Russia and the U.S.A.
#Tomato mosaic tobamovirus (syn. *Tomato mosaic virus*)	ToMV	TOMV00	Tomato, sweet pepper,	First reported in *Lycopersicon esculentum*; from Connecticut, U.S.A.
Tobacco streak virus	TSV	TSV000	Tobacco, vegetables, ornamentals, potato	First reported in *Nicotiana tabacum*; from Wisconsin, U.S.A.
Tomato spotted wilt tospovirus (syn. *Tomato spotted wilt virus*)	TSWV	TSWV00	Vegetables (esp. Solanaceae like tomato and potato), sunflower, ornamentals	First reported in *Lycopersicon esculentum*; from Australia; agricultural pest in Asia, America, Europe and Africa
*Zucchini yellow mosaic potyvirus**	ZYMV	ZYMV00	Cucurbitaceae	First reported in *Cucurbita pepo*; from Italy

Virus/Viroids (Species names)	Code used in Tests	EPPO-Code	Potential infected plants	Additional information
Chrysanthemum stunt viroid	CSVd	CSVD00	Chrysanthemums & argyranthemums	First described in *Chrysanthemum* from U.S.A.; highly mechanically transmissible
Potato spindle tuber viroid	PSTVd	PSTVD0	Solanaceae (esp. Potato, tomato & eggplant)	First reported in *Solanum tuberosum*; from North America

Information on application technique

Coarse spray

Usual spray equipment is being used for the coarse spraying. The coarse spray of MENNO Florades solution is directed to the surfaces, the thin layer of solution ahs to be dried (usually overnight) before reusing the surfaces.

Foam disinfection

To increase the spray monitoring, the wetting and adhesion and for a higher worker safety the applicant has developed the so called skumix® optimized for foam application of MENNO Florades. Skumix is an application unit producing foam from the mixture of MENNO Florades with water.

MENNO Florades is applied as homogeneous dense creamy foam onto the target surface. The technology can be placed with an assembly console on a 1.000 l water tank or 200 l barrel. Filling with 1.000 litres solution MENNO Florades (2 % = 20 l in 980 l water, applying 0.4 l/m²) is sufficient for up to 2.500 m².
The advantages of skumix® are recognizable: There is less odor, less fog, less user-exposure, a better spray monitoring by foam on treated areas, reduced of water volume entry, optimal wetting and adhesion due to stand and creeping properties of foam into profiles, cracks and interstices, highly variable for individual application requirements, e.g. manually guided foam lance, movable foam rods for roll table treatment or installed in crate washing facilities, etc.

Foaming is therefore ideal any kind of surfaces and machines or container. The foam is completely dried before reusing the equipment.

Figure 1: Warehouse disinfection (walls) with skumix techniques

Figure 2: Treatment of benches with Skumix

Figure 3: Tray washing machine: optimized contact of foam with treated trays

Watering

Watering of surfaces by can (pouring of aqueous solution or foam), or by automatic equipment.

Soaking

Small containers, boxes, transport container, or culture pots may be disinfected by soaking them in a solution of MENNO Florades. However, for economic gardening this kind of disinfection is hardly used any longer. Therefore this application technique is no longer applied for MENNO Florades.

Flooding

Flooding is only suitable for sealed plain, non-profiled hard surfaces using a very thin solution of Benzoic acid. Using concrete surfaces sealed with synthetic material (plastic) is a very modern system of flooding because the loss of water and fertilized culture medium is very low. It can be perfectly used for benzoic acid to disinfect the surface as well. MENNO Florades is building a very thin film and is completely drying on the surfaces overnight.

Profiled tables with water flood furrows (ebb-and-flow benches) are not suitable for flooding - the loss of benzoic acid is too high. This kind of tables will be foamed.

Dipping of small cutting tools

For propagation of potatoes the eyes have to be cut from the tuber. Also for cutting the roots of plants or any other propagation plant material knives and other small tools have to be used. To avoid infestation from one to the other plant or tuber, the tools are dipped for 3 minutes in a small container between each working step.

Application technique:
In none of the trials the test product was applied by foaming. According to the applicant, no changes in formulation or any additives or foaming agents were used to produce the foam. Therefore Germany decided already several years ago to extrapolate the efficacy data of trials with spraying or watering as application technique to the application by foaming. This technique was used for several years now in practice and there is no evidence for a reduced efficacy. On the contrary, foaming has the advantage that the product adheres better to uneven or vertical surfaces than a liquid. Therefore it is also easier to follow the necessary exposure times. No further trials are required.

"Flooding" was not part of the registration for MENNO FLORADES so far in Germany but it is considered to make no difference compared to watering or spraying with the same spray volume (8000 L/ha). The spray volume of 8000 L/ha intended for flooding allows only flooding of very plain standing areas like described above. The cMS should therefore verify, whether this kind of application technique is relevant for their country or not.

Abbreviations

Table 6- 5: Abbreviations used in this dossier

as	Active substance
BBA	Biologische Bundesanstalt für Land- und Forstwirtschaft
CVU	Colony-forming unit
DE	Germany
EPPO	European and Mediterranean Plant Protection Organisation
GEP	Good experimental practice

GLP	Good laboratory practice
JKI	Julius Kühn-Institute
n.t.	Not tested
n.st.	Not stated
RT-PCR	Real Time-Polymerase Chain Reaction
SL	Soluble concentrate
Trial ID	Trial identification
pv.	Pathovar

IIIA1 6.1 Efficacy data

Preliminary remarks to dossier structure and evaluation of efficacy

Dossier structure

6.1.1 - Preliminary range-finding tests:
Under this point tests are described dealing with efficacy of pests beyond the bactericidal, fungicidal, virucidal pests described under 6.1.2 and 6.1.3.

6.1.2 - Minimum effective dose:
In this chapter, mainly suspension and agar plate tests are presented. Taken the results of these tests into account, the final decision was made which concentration is effective enough against the pests to be included into the GAP.

6.1.3 - Efficacy tests
In the first place you will find the same suspension and agar plate tests as before, but in contrast to the ´Minimum effective dose tests´ analysis, the data are reduced to the relevant, practical concentration according to the GAP and compared to results with reference products (if available).
Subsequently practical oriented tests (on surfaces or small tools) complete the efficacy tests, arranged according to the type of pathogen.

Evaluation of trial reports
Tests were only included in the summary tables, if 3 of 3 replicates showed full control of the organism.
In case of suspension and agar plate tests only studies were used in which all three replications of the control showed growth. If there were irregularities in the controls (e.g. no growth in 1, 2 or 3 replicates), these trials were rejected as invalid.
In the more practical oriented test results lower efficacy was considered, since full control is not reachable – please see beneath some further explanations.

Evaluation of efficacy:

Tests with qualitative data: Suspension and agar plate tests as well as some other present qualtitative data, the evaluation of efficacy refers to the number of available trials for each tested time/concentration-combination, in which a complete disinfection was achieved. As a trigger of efficacy, the German authorities require complete (=100 %) efficacy whereas the applicant claims that under practical conditions this cannot always be achieved and claims that 85 % should be sufficient.

Tests with quantitative data: A complete inactivation/elimination of phytopathogenic bacteria, fungi, viruses and viroids with disinfectants is not achievable under practical conditions: In agricultural and horticultural production areas, the intended application sites of MENNO Florades, conditions are difficult, because of soil attachments, uneven surfaces etc. Therefore, the applicant consideres a disinfection rate of about 85% as adequate for the efficacy against plant diseases whereas the German authorities consider 100 % as successful disinfection.
Apart from this, the thorough mechanical cleaning of surfaces prior to application is highly recommended.

Comment on evaluation of efficacy:

Disinfection does not necessarily mean that all phytopathogenic propagules are killed or inactivated. But the propagules should be reduced to a level that does not allow infection of plants. Different trials on the same organism sometimes result in different concentrations/exposure times necessary for control. In this case always the higher concentration/longer exposure time is recommended for the use, to be on the safe side.

Guidelines and GEP:
Earlier trials were conducted according to the national German BBA-guideline 16-4 of the former 'Biologische Bundesanstalt für Land- und Forstwirtschaft', today part of the 'Julius Kühn-Institut' (JKI) or according to current scientific knowledge (e.g. the efficacy against viruses). The German guideline and the methodology for efficacy testing against viruses were included into the EPPO guideline PP 1/261, available since 2008. Therefore all trials followed nearly the same methodology.
Trials before and after implementation of GEP are presented. Table 6.7-1 gives an overview on the GEP status of the trials. The GEP certificates are presented in the BAD.

Organic material is a limiting factor in the efficacy of disinfectants. Therefore, the tests were performed with inclusion of organic matter ('with peat') and without inclusion ('without peat). Since the results of these two variants did not differ, only the former ones ('with peat') were presented for evaluation.
A test with floating mats was not included in the analytical evaluation, since no control variant was present and the experimental design did fit in no pattern: This study is described in the BAD only for its results regarding potential phytotoxicity.

For all efficacy tests (6.1.3) reference products were included in the assessment if being tested, however, for viruses and viroids no registered reference products has been (and still is) available. And the disinfectant used as reference against bacteria and fungi (MENNO TER forte) does not act virucidal.

For the practical effectiveness of tests concerning 'surfaces' also 'laboratory tests' were included, in which exemplary greenhouse materials were tested.
The practical effectiveness of tests with plants treated with MENNO Florades, are not included in the efficacy tests by now, since this application is not part of the GAP to this date. These trials are presented under point IIIA1 6.2.1 considering potential phytotoxic effects and partially under IIIA1 6.1.1.

IIIA1 6.1.1 Preliminary range-finding tests

Since its discovery, the active ingredient benzoic acid has been registered and used in various fields of applications. So far, the bactericidal, fungicidal and virucidal properties of benzoic acid are commonly known. Furthermore experimental trials have described the range of efficacy within and beyond bactericidal, fungicidal and virucidal properties.

Some more information is given in Appendix 3 of the BAD and is for information purposes only, not for evaluation or risk assessment:

- Control of nematodes
- Efficacy against bacterial harmful organisms
- Efficacy against fungi
- Efficacy against viruses

The results prove the broad range of susceptible harmful organisms.

IIIA1 6.1.2 Minimum effective dose tests (here: suspension tests)

Within this chapter, mainly the results of the suspension tests (and agar plate tests) are subsumed, having a stricter test design than the test conducted under more practical conditions.
Only in exceptional cases the application rate/ha is given in the test reports, because under the practical conditions not applicable and the concentration and exposure time to the spray solution is relevant. Therefore, all results are presented like that.

For disinfection in plant production for bacterial and fungal harmful organisms an EPPO guideline is available since 2008[5]. Most of the tests have been performed before implementation of this guideline and therefore were conducted according to the national German BBA-guideline 16-4 of the former 'Biologische Bundesanstalt für Land- und Forstwirtschaft', today part of the 'Julius Kühn-Institut' (JKI) or according to current scientific knowledge (e.g. the efficacy against viruses).

In all efficacy tests (laboratory tests and trials under practical conditions) different concentrations of MENNO Florades were used in combination with different exposure times. Therefore no separate minimum effective dose tests are required.

For a better overview most test results of Part A of the EPPO guideline PP 1/261 (suspension tests for assessment of bactericidal activity, tests with contaminated carriers for assessment of fungicide activity, and in-vitro testing for the assessment of efficacy against viruses and virus like organisms) are presented in this chapter. They are also summarised in chapter 6.1.3.

IIIA1 6.1.2.1 Control of bacteria

Material and methods

Against bacteria, 9 suspension and 1 agar plate trials with in total 23 results testing MENNO Florades 0.25 - 5 % are available. Presented are the results for testing with MENNO Florades 0.25 - 3 %, because it turned out that 1 - 2 % will be the aimed concentration for the intended uses.
In total 23 results with different bacteria species are available. In case of 21 results time and concentration was stated and for 2 results only the concentration was given (=supportive results). There was one Canadian trial, which was fully included in the evaluation, because all intended uses are indoor or greenhouse, thus the climatic conditions outside do not play a major role in the control of the pests.
Please regard that at time of test performance, no EPPO guideline was available (but German BBA guideline) and only very few contract laboratories are able to test the product under GLP conditions. However, German experts have performed the tests being specialized in this research area at university.

Table 6.1.2- 1: Bacteria: Trials for evaluation of the minimum effective dose

	Suspension trials	**Supportive trials***	**Thereof: GEP / Guideline**
Germany, Switzerland, UK, Canada (representative for all EPPO zones because of indoor use only)	9 tests with 21 results of different (sub-)species	1 agar plate test = 2 results with different (sub-)species	GEP: 3 results Guideline: 8 results
Total # of results	**21**	**2**	**3 GEP & Guideline**

[5] PP 1/261 (1), first approved in 2008-09.

* In the supportive trials, the disinfection time has not been reported.

In table 6.1.2-1 Germany, Switzerland, UK and Canada are named as origin for the presented trials. This is a mistake by copy and paste throughout the whole dRR. In total only three trials on efficacy and two trials on phytotoxicity were conducted in other countries than Germany (see table 6.7-1).

More details of these trials on material and methods and results are reported at the end of this chapter.

Results

In total 23 trials with different bacteria species are shown. In case of 21 trials time and concentration was stated (suspension tests) and for supportive 2 trials only the concentration was given (agar plate tests). A summary of the results of these tests with MENNO Florades against bacteria is presented in the following two tables.
The number of results, the percentage of trials with 100 % efficacy respectively, is shown. In case that time was stated, specified time periods were also taken into account. Organic material is often the limiting factor in context with efficacy of disinfectants. To evaluate the influence of this material, the tests were conducted with and without peat. Since the results were not actually different between testing with and without peat, only results with peat are summarized here.
For the suspension tests with bacteria no clear dose response is observed. For all tested concentration / time combinations, the lowest concentration together with the lowest exposure time results in complete disinfection. Already 0.4 or 0.5 % MENNO Florades achieved complete disinfection after 1 minute exposure.

Table 6.1.2- 2: Bacteria: Summarized results of suspension tests (Canadian trial = MEN-07-47)

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination (n.t. = not tested)					
		0.25 %	0.4 - 0.5 %	1 %	2 %	3 %	Time tested
MEN-07-37	*Agrobacterium tumefaciens*	n.t.	n.t.	1 min	1 min	n.t.	1, 3, 5 min
MEN-07-04[6]	*Clavibacter michiganensis*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-01	*Clavibacter michiganensis* ssp. *michiganensis*	5 min	5 min	5 min	n.t.	n.t.	5, 15, 30 min
MEN-07-47	*Clavibacter michiganensis* ssp. *michiganensis*	n.t.	5 min	5 min	5 min	n.t.	5, 15, 30 min
MEN-07-03	*Clavibacter michiganensis* ssp. *sepedonicus*	5 min	5 min	5 min	n.t.	n.t.	5, 15, 30 min
MEN-07-04	*Erwinia amylovora*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-04	*Erwinia carotovora pv. atroseptica*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-43	*Erwinia carotovora pv. atroseptica*	n.t.	n.t.	1 min	1 min	n.t.	1, 2, 3, 5 min
MEN-07-04	*Erwinia carotovora pv. carotovora*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-43	*Erwinia carotovora pv. carotovora*	n.t.	n.t.	1 min	1 min	n.t.	1, 2, 3, 5 min
MEN-07-04	*Pseudomonas lachrymans*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-04	*Pseudomonas putida*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-03	*Pseudomonas solanacearum (= Ralstonia solanacearum)*	5 min	5 min	5 min	n.t.	n.t.	5, 15, 30 min
MEN-07-04	*Pseudomonas syringae*	n.t.	n.t.	3 min	n.t.	n.t.	3 min

[6] Results for/of an untreated control were not stated.

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination (n.t. = not tested)					
		0.25 %	0.4 - 0.5 %	1 %	2 %	3 %	Time tested
MEN-07-35	Rifamycin-resistant strain of *Xanthomonas campestris pv. pelargonii* (Suspension test)	n.t.	n.t.	1 min	n.t.	1 min	1, 2, 3, 5 min
MEN-07-35	Rifamycin-resistant strain of *Xanthomonas campestris pv. pelargonii* (Smear onto RGH resp. YDC Agar)	n.t.	n.t.	1 min	n.t.	1 min	1, 2, 3, 5 min
MEN-07-04	*Xanthomonas campestris pv. begoniae*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-04	*Xanthomonas campestris pv. campestris*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-04	*Xanthomonas campestris pv. pelargonii*	n.t.	n.t.	3 min	n.t.	n.t.	3 min
MEN-07-05	*Xanthomonas campestris pv. pelargonii*	5 min	5 min	5 min	n.t.	n.t.	5 min, 4 h

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination (n.t. = not tested)					
		0.25 %	0.4 - 0.5 %	1 %	2 %	3 %	Time tested
MEN-07-40	*Xanthomonas campestris pv. pelargonii*	n.t.	1 min	1 min	1 min	n.t.	1, 2, 3 min
Number of results 21		4	6	21	5	2	
# of tests Thereof: Reaching 100 % efficacy within 1 min		n.t.	**1/1 (100 %)**	**6/6 (100 %)**	**4/4 (100 %)**	**2/2 (100 %)**	
# of tests Thereof: Reaching 100 % efficacy within 3 min		n.t.	**1/1 (100 %)**	**16/16 (100 %)**	**4/4 (100 %)**	**2/2 (100 %)**	
# of tests Thereof: Reaching 100 % efficacy within 5 min		4/4 (100 %)	**6/6 (100 %)**	**21/21 (100 %)**	**5/5 (100 %)**	**2/2 (100 %)**	

Table 6.1.2- 3: Bacteria: Supportive results, when concentration was stated only (agar plate tests)

Trial ID	Pathogen	Growth of Pest (Rating: Growth + / No growth – / not tested n.t.)					
		Results without peat[7]					Time tested
		0.1 %	0.4 % & 0.5 %	1 %	2 %	4 %	
MEN-07-50	*Erwinia carotovora*	+	n.t.	—	—	—	not stated
	Streptomyces scabies	n.t.	n.t.	n.t.	—	—	
Number of results 2		1	0	1	2	2	
# of tests Thereof reaching 100 % efficacy		0/1 (0 %)	- (-)	1/1 (100 %)	2/2 (100 %)	2/2 (100 %)	

Conclusions

All tests show that 1 % MENNO Florades is sufficient to control bacteria, regardless which time the bacteria are exposed to the product.
It is concluded that 3 to 5 minutes exposure time to 1 % MENNO Florades is sufficient for an effective control of bacterial harmful organisms.

[7] Results were not actually different between testing with and without peat. Therefore only results with peat are summarized here.

IIIA1 6.1.2.2 Fungal harmful organisms

Material and methods

Against fungi, 7 suspension- and 1 agar plate tests with in total 37 results testing MENNO Florades 0.1 – 11.11 % are available. Presented are the results for testing with MENNO Florades 0.1 - 3 %, because it turned out that 1-2 % will be the aimed concentration for the intended uses.
In total 37 results with different fungi species are shown. In case of 21 results time and concentration was stated (suspension tests) and for 16 results only the concentration was given (agar plate tests = supportive trials). There was one Canadian trial, which was fully included in the evaluation, because all intended uses are indoor or greenhouse, thus the climatic conditions outside do not play a major role in the control of the pests.
Please regard that at time of test performance, no EPPO guideline was available (but German BBA guideline) and only very few contract laboratories are able to test the product under GLP conditions. However, German experts have performed the tests being specialized in this research area at university.

Table 6.1.2- 4: Fungi: Trials for evaluation of the minimum effective dose

	Suspension trials	**Supportive trials***	**Thereof: GEP / Guideline**
Germany, Switzerland, UK, Canada (representative for all EPPO zones because of indoor use only)	7 tests with 21 results of different (sub-)species	2 agar plate tests = 16 results with different (sub-)species	GEP: 8 results Guideline: 15 results
Total # of results	**21**	**16**	**8 GEP & Guideline**

* In the supportive trials, the disinfection time has not been reported.

Results

As a result of the differing amount of trials per time/concentration-combination and the experimental design, no clear dose effect after treatment with MENNO Florades is observable. For 0.1 % MENNO Florades only one trial with stated time is available.
At equal incubation time and increasing MENNO Florades concentration results in increasing efficacy and extended incubation time did as well.

Table 6.1.2- 5: Fungi: Summarized results of suspension tests (Canadian trial = MEN-07-47)

Trial ID	**Pest**	**100 % efficacy reached at following concentration / time combination**				
		0.1 %	**0.4 & 0.5 %**	**1 %**	**2 %**	**Tested times**
MEN-07-44	'Erikenpilz' (unidentified pathogenic fungi on *Erica gracilis*)	n.t.	n.t.	60 min	60 min	60 min, 4 h, 16 h
MEN-07-40	*Alternaria* sp.	n.t.	16 h	4 h	60 min	60 min, 4 h, 16 h
MEN-07-40	*Botrytis cinerea*	n.t.	60 min	60 min	60 min	60 min, 4 h, 16 h
MEN-07-47	*Botrytis cinerea*	n.t.	> 5 min	< 5 min	< 5 min	Not specified
MEN-07-40	*Colletotrichum* sp.	60 min	n.t.	60 min	60 min	60 min, 4 h, 16 h
MEN-07-40	*Cylindrocladium scoparium*	n.t.	16 h	4 h	4 h	60 min, 4 h, 16 h
MEN-07-41	*Dactylium dendroides*	n.t.	n.t.	60 min	60 min	60 min, 4 h, 16 h
MEN-07-47	*Didymella bryoniae*	n.t.	< 5 min	< 5 min	< 5 min	Not specified
MEN-07-38	*Fusarium oxysporum*	n.t.	n.t.	16 h	4 h	30 min, 60 min, 4 h, 16 h
MEN-07-39	*Fusarium oxysporum f.*sp. *cyclaminis*	n.t.	n.t.	16 h	60 min	30 min, 60 min, 4 h, 16 h

Trial ID	Pest	100 % efficacy reached at following concentration / time combination				
		0.1 %	**0.4 & 0.5 %**	**1 %**	**2 %**	**Tested times**
MEN-07-40	*Fusarium oxysporum f.*sp. *cyclaminis*	n.t.	16 h	4 h	60 min	60 min, 4 h, 16 h
MEN-07-43	*Fusarium solani var. coeruleum*	n.t.	n.t.	60 min	60 min	60 min, 4 h, 16 h
MEN-07-47	*Fusarium* ssp.	n.t.	< 5 min	< 5 min	< 5 min	Not specified
MEN-07-43	*Helminthosporium solani*	n.t.	n.t.	60 min	60 min	60 min, 4 h, 16 h
MEN-07-40	*Mucor* sp.	n.t.	> 16 h	> 16 h	60 min	60 min, 4 h, 16 h
MEN-07-40	*Phytophthora cinnamomi*	n.t.	60 min	60 min	60 min	60 min, 4 h, 16 h
MEN-07-47	*Pythium aphanidermatum*	n.t.	< 5 min	< 5 min	< 5 min	Not specified
MEN-07-40	*Rhizoctonia solani*	n.t.	4 h	4 h	60 min	60 min, 4 h, 16 h
MEN-07-40	*Thielaviopsis basicola*	n.t.	16 h	4 h	60 min	60 min, 4 h, 16 h
MEN-07-41	*Trichoderma viride*	n.t.	n.t.	16 h	4 h	60 min, 4 h, 16 h
MEN-07-41	*Verticillium fungicola*	n.t.	n.t.	60 min	60 min	60 min, 4 h, 16 h
Number of results 21		0	12	21	21	
Thereof: Reaching 100 % efficacy within 60 min		1/1 (100 %)	6/12 (50 %)	12/21 (57 %)	**18/21 (86 %)**	
Thereof: Reaching 100 % efficacy within 4 hours		1/1 (100 %)	7/12 (58 %)	17/21 (81 %)	**21/21 (100 %)**	
Thereof: Reaching 100 % efficacy within 16 hours		**1/1 (100 %)**	**11/12 (92 %)**	**20/21 (95 %)**	**21/21 (100 %)**	

Total control (100 %) of all fungi tested has been achieved at 2 % MENNO Florades after 4 h exposure time. With exception of Mucor, fungal species can already be controlled at 1 % MENNO Florades after 16 hours exposure time.

The same results were achieved in the supportive tests were concentration was stated, but not the exposure time:

Table 6.1.2- 6: Fungi: Supportive results, when concentration was stated only (agar plate tests)

Trial ID	Pest	Growth of Pest (Rating: Growth + / No growth — / not tested n.t.)					
		Results without peat[8]					Time tested
		0.1 %	**0.4 & 0.5 %**	**1 & 1.1 %**	**2 %**	**4 %**	
MEN-07-50	*Alternaria alternata*	+	n.t.	—	—	—	Not stated
MEN-07-50	*Alternaria solani*	+	n.t.	+	—	—	Not stated
MEN-07-50	*Cercospora beticola*	+	n.t.	—	—	—	Not stated
MEN-07-50	*Colletotrichum coccodes*	+	n.t.	—	n.t.	n.t.	Not stated
MEN-07-50	*Helminthosporium solani*	+	n.t.	+	n.t.	n.t.	Not stated
MEN-07-50	*Phytophthora infestans*	+	n.t.	—	—	—	Not stated
MEN-07-50	*Pythium ultimatum*	+	n.t.	—	—	—	Not stated
MEN-07-50	*Ramularia beticola*	+	n.t.	—	—	—	Not stated
MEN-07-50	*Rhizoctonia solani (AG2-2 IIIB)*	+	n.t.	—	—	—	Not stated
MEN-07-50	*Rhizoctonia solani (AG3),*	+	n.t.	—	—	—	Not stated
MEN-07-24	*Trichoderma harzianum*-Th2 (Mycelial growth)	n.t.	+	—	n.t.	n.t.	Not stated
MEN-07-24	*Trichoderma harzianum*-Th2 (Spore germination)	n.t.	+	—	n.t.	n.t.	Not stated

[8] Results were not actually different between testing with and without peat. Therefore only results with peat are summarized here.

Trial ID	Pest	Growth of Pest (Rating: Growth + / No growth — / not tested n.t.)					
		Results without peat[8]					Time tested
		0.1 %	**0.4 & 0.5 %**	**1 & 1.1 %**	**2 %**	**4 %**	
MEN-07-24	*Verticillium fungicola* (Mycelial growth)	n.t.	—	—	n.t.	n.t.	Not stated
MEN-07-24	*Verticillium fungicola* (Spore germination)	n.t.	—	—	n.t.	n.t.	Not stated
Number of results 14		10	4	14	8	8	
# of results Thereof reaching 100 % efficacy		0/10 (0 %)	2/4 (50 %)	**12/14** **(86 %)**	**8/8** **(100 %)**	**8/8** **(100 %)**	

Total control (100 %) of all fungi tested has been achieved at 2 % MENNO Florades after 4 h exposure time. However, a lot of species fungi can already be controlled at 1 % MENNO Florades after 16 hours exposure time.

Conclusions

Total control (100 %) of all fungi has been achieved at 2 % MENNO Florades after 4 hours exposure, but the bulk of species may also be controlled at 1 % after 16 hours exposure. Based on these results, following rates are proposed:

- Control at 1 % MENNO Florades: 16 hours disinfection
- Control at 2 % MENNO Florades: 4 hours disinfection

IIIA1 6.1.2.3 Viruses and viroids

Material and methods

Against viruses and viroids, total of 5 plant juice inocculum trials testing MENNO Florades in concentrations of 1 – 5 % are available. Only the test results with MENNO Florades max. 4 % are presented, because these were obtained as the aimed concentration range for the intended uses.
Results for the application of the remaining concentrations for all pathogens can be found in the detailed tables in the BAD. There was one Canadian trial, which was fully included in the evaluation, because all intended uses are indoor or greenhouse, thus the climatic conditions outside do not play a major role in the control of the pests.
For evaluation of viruses and viroids a total of 9 results are available, with 8 results presenting concentration and time of the disinfection that were fully used for evaluation. One further result is available from Canada, where only the concentration was given, but not the timing of disinfection (=supportive results).

Please regard that at time of test performance, no EPPO guideline was available and tests were performed by German experts who are specialized in this research area at university, therefore, no GEP test is available.

Table 6.1.2- 7: Viruses and viroids: Trials with for evaluation of the minimum effective dose

	Inocculum tests on plants	Supportive trials	Thereof: GEP / Guideline
Germany, Switzerland, UK, Canada (representative for all EPPO	5 tests with 8 results of different (sub-)species	1 test = 1 result of one species	GEP: 0 results Guideline: No guideline available at time of test performance

zones because only indoor uses are intended)			
Total # of results	**8**	**1**	**0 GEP**

Results

The trial results show a clear dose effect after treatment with MENNO Florades. For all concentration / time combinations it is clearly visible that with the same incubation time an increasing MENNO Florades concentration results in increasing efficacy. Also a longer incubation time results in increasing efficacy.

The trials without stated incubation time confirm the exception of some virus types. Here only MENNO Florades concentration of 4 % is sufficient for disinfection. However it has to be mentioned that in case of the Pepino mosaic Virus the results are inconsistent. In trials where time and concentration was stated, this virus is already inactivated after 10 seconds with a MENNO Florades concentration of 4 % compared to the needed 16 hours in the trial where only the concentration was stated.

Table 6.1.2- 8: Viruses and viroids: Summary of results (inoculum tests)

Trial ID	**Pathogen**	**100 % efficacy reached at following concentration / time combination Rating: i = no effect, incomplete or no virus inactivation; exposure time needed for disinfection (s = seconds; m = minutes; h = hour) n.t. = not tested**				
		1 %	**2 %**	**3 %**	**4 %**	**Time tested**
MEN-07-18	*Bell pepper mottle tobamovirus (BPeMV) - Tobamovirus*	i	i	16 h	30 s	10 s, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-17	*Chrysanthemum stunt viroid*	n.t.	1 min	30 s	n.t.	10 s, 30 s, 1 min
MEN-07-18	*Melon necrotic spot carmovirus*	i	2 min	30 s	10 s	10 s, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-16	*Pepino mosaic virus*	i	8 h	30 s	10 s	10 s, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-18	*Pepper mild mottle tobamovirus (PMMoV) - Tobamovirus*	i	i	16 h	30 s	10 s, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-15	*Potato spindle tuber viroid*	i	1 min	10 s	n.t.	10 s, 30 s, 1 min
MEN-07-20	*Tobacco streak virus*	i	i	i	5 min	30 s, 1, 2, 4, 5, 10, 30 min[9]
MEN-07-20	*Tobacco streak virus*	7 h	16 h	n.t.	n.t.	1, 7, 16 h
MEN-07-18	*Zucchini yellow mosaic potyvirus*	i	1 h	10 s	10 s	10 s, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-18	*Zucchini yellow mosaic potyvirus*	i	8 h	30 s	10 s	10 s, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
Number of results 10		9	10	9	7	
# of tests Thereof: Reaching 100 % efficacy within 3 min		0/9 (0 %)	3/10 (30 %)	6/9 (75 %)	**6/7** **(86 %)**	
# of tests Thereof: Reaching 100 % efficacy within 60 min		0/9 (0 %)	4/10 (40 %)	6/9 (75 %)	**7/7** **(100 %)**	
# of tests Thereof: Reaching 100 % efficacy within 4 hours		0/9 (0 %)	4/10 (40 %)	6/9 (75 %)	**7/7** **(100 %)**	
# of tests Thereof: Reaching 100 % efficacy within 16 hours		1/9 (11 %)	7/10 (70 %)	**8/9** **(89 %)**	**7/7** **(100 %)**	

Two supportive results are available when time tested is not stated:

[9] Not all concentration-time-combinations were tested. For details see 6.1.3/20.

Table 6.1.2- 9: Viruses and viroids: Supportive results, when only concentration was stated (Test from Canada)

Trial ID	Pest	100 % efficacy reached at following concentration / time combination Rating: c effect, complete virus inactivation i no effect, incomplete virus inactivation			
		1 %	2 %	4 %	Time tested
MEN-07-47	*Pepino mosaic Virus*	i	i	c	not stated
MEN-07-47	*Tomato mosaic tobamovirus*	i	i	c	not stated
Number of results 2		2	2	2	
# of tests Thereof reaching 100 % efficacy		0/2 (0 %)	0/2 (0 %)	2/2 (100 %)	

Conclusions

Full inactivation (100 %) of viruses and viroids is achieved at 4 % MENNO Florades, if the pests are exposed 1 hour at least to the test substance. However, some viruses are easier to inactivate than other and (in example) 2 % at 16 hours exposure time could be sufficient. Further tests (i.e. surface tests) show sufficient inactivation even at 1 %. These tests are presented under 6.1.3. It was decided to provide minimum concentration in combination of exposure time for the inactivation of viruses:

- inactivation of viruses and viroids is difficult: 4 % (max. 16 h)
- inactivation of viruses and viroids is medium difficult: 2 % (max. 16 h)
- inactivation of viruses and viroids is easy: 1 % (max. 16 h)

Please regard: The above mentioned timing is maximum to unify the uses and will be applied for in the application. In the label, shorter times will be recommended, which reflect the results in more detail.

IIIA1 6.1.2.4 Overall conclusion

MENNO Florades with benzoic acid as active ingredient is a suitable tool for disinfection. The results presented in this dossier support following concentrations:

For control of bacterial harmful organisms 3 minutes at 1 % are sufficient. However, since they are often combined for control of fungal harmful organisms, prolonged exposure is more suitable.

For control of fungal harmful organisms 1 % concentration combined with a prolonged exposure time may already be sufficient for some species. At 2 % after 4 hours, 100 % of the tested fungi were controlled.

Virus and viroids need somehow higher concentrations and prolonged exposure time for being inactivated. More details are provided under point 6.1.3.

In addition to that and to enhance the effectiveness, it is recommended to clean any material very thoroughly before disinfection.

Conclusion:
Bacteria/ Suspension tests:
Control of all tested bacteria was given after 3 to 5 minutes exposure time to 1% MENNO Florades (table 6.1.2-2).

Fungi/ Tests with contaminated carriers:
Results of tests with contaminated carriers are shown in table 6.1.2-5 (declared as suspension tests by the applicant). Control of all tested fungi was given at the latest after 16 h exposure time to 1% MENNO Florades (except *Mucor* sp.) and 4 h exposure time to 2% MENNO Florades, respectively.

Viruses and virus like organisms/ In vitro tests:
Concentration and exposure times necessary for inactivation depend very much on the viruses and viroids tested (see table 6.1.2-8 for in vitro tests). Further information is given under point 6.1.3.

IIIA1 6.1.3 Efficacy tests

Within this chapter, you will find a summary of all the tests which have been conducted under the GAP conditions as defined before under the conclusion of chapter 6.1.2. This does not exclude that surveys of the suspensions tests (bacteria, fungi) or inoculum tests in plants (viruses) (and partly also of the tests) have to be repeated. However, the tables are reduced to the concentrations as proposed in the GAP and the results of the suspension tests are assorted to the intended GAP concentration/time combination.
Since in one or the other test report only the results for lower concentrations have been reported than the intended concentration of the GAP, the results for lower concentrations were also included.

Material and methods

For disinfection an EPPO guideline is available only since 2008[10]. Most tests have been performed before implementation of this guideline and therefore were conducted according to the national German BBA-guideline 16-4 of the former 'Biologische Bundesanstalt für Land- und Forstwirtschaft', today part of the 'Julius Kühn-Institut' (JKI) or according to current scientific knowledge (e.g. the efficacy against viruses).

Tested reference products will be described in the following table. In more recent tests either no reference product is used or in some cases MENNO TER forte with the active ingredient didecyldimethylammonium chloride, which according to Commission Directive 2009/70/EC is added to Annex I of 91/414/EEC on January 1, 2010. Since MENNO TER forte is not efficient against viruses and no registered disinfectant against viruses is available, no reference products were tested in this context. MENNO Florades is and was at the time of writing the only disinfectant authorised as plant protection product.

Table 6.1.3- 1: Overview of reference product used in efficacy trials

Reference product		Active ingredient
Environ		Biphenyl-2-ol, Chlorophene
Ethanol		Ethanol 70 %
Formaldehyde		Formaldehyde 2 %
MENNO TER forte		Didecyldimethylammoniumchlorid
Venno Oxygen		Anorganic Oxygen-releaser
Sanosil		Hydrogen peroxide
Unspecified reference products	1	Sodium Hypochlorite
	2	Quaternary ammonium[11] + Isopropyl-OH
	3	various (no details stated)

[10] PP 1/261 (1), Efficacy evaluation of plant protection products, Disinfection in plant production. First approved in 2008-09.
[11] Quaternary ammonium (didecyldimethyl ammonium chloride)

	4	H_2O_2 + Peracetic Acid
	5	H_2O_2 + Peracetic Acid
	6	Quaternary[12] ammonium
	7	Polyhydrochloride
	8	Potassium peroxomonosulphate

IIIA1 6.1.3.1 Control of bacterial harmful organisms

Only in exceptional cases the application rate/ha is given in the test reports, because under the practical conditions not applicable and the concentration and exposure time to the spray solution is relevant. Therefore, all results are presented accordingly.

Intended GAP for Bacterial harmful organisms

Crop and/or situation (crop destination / purpose of crop)	**F G or I**	**Application techniques**		**Maximum desinfection concentration (time)**
		Method / Kind	Max. number (min. interval between applications) a) per use b) per crop/ season	
Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Directed coarse spray or foaming (lathering)	a) 1 b) not applicable	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Watering	a) 1 b) not applicable	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Flooding	a) 1 b) not applicable	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Dipping	a) 1 b) not applicable	4 % - 3 min No direct treatment of plants, soil or substrates. Only for disinfection.

Material and methods

Mainly suspension tests are available with bacteria, because in the practice viruses are more difficult to control. Concentrations of MENNO Florades being effective against viruses are also effective against bacteria. Besides the suspension tests a limited number of results are available when MENNO Florades has been tested under more practical conditions.

Table 6.1.3- 2: Bacteria: Available trials for evaluation of the efficacy

	Suspension tests	**Practical tests**	**Thereof: GEP / Guideline**

[12] Quaternary ammonium [n-alkyl (60% C14, 30% C16, 5%C12, 5% C18) dimethyl benzyl ammonium chloride, and n-alkyl (68% C12, 32% C14) dimethyl ethylbenzyl ammonium chloride]

Germany, Switzerland, UK, Canada (relevant for all EPPO zones)	6 tests with 16 results of different (sub-)species	Surfaces*: 2 tests with 2 results of different (sub-)species Small tools**: 2 tests with 2 results of different (sub-)species	GEP: 3 results Guideline: 8 results
Total # of results	**16**	**4**	**3 GEP & Guideline**

*"Surfaces" are understood as e.g. trays, benches, tables, containers, room walls, equipment, machines
**'small tools" are understood as e.g. knives or other cutting tools

Results

Suspension tests: In contrast to the ´Minimum effective dose tests´ analysis, the data are reduced to the relevant, practical concentration and compared to results with reference products. Designated application scenarios are assigned to the results of the different categories of exposure times.

Table 6.1.3- 3: Bacteria: Summarized results of suspension tests with MENNO Florades

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination (n.t. not tested)[13]			
		1 %	2 %	Ref. product	Time tested
MEN-07-37	*Agrobacterium tumefaciens*	1 min	1 min	1 min	1, 3, 5 min
MEN-07-04[14]	*Clavibacter michiganensis*	3 min	n.t.	n.t.	3 min
MEN-07-01	*Clavibacter michiganensis* ssp. *michiganensis*	5 min	n.t.	n.t.	5, 15, 30 min
MEN-07-47	*Clavibacter michiganensis* ssp. *michiganensis*	5 min	5 min	n.t.	5, 15, 30 min
MEN-07-03	*Clavibacter michiganensis* ssp. *sepedonicus*	5 min	n.t.	n.t.	5, 15, 30 min
MEN-07-04	*Erwinia amylovora*	3 min	n.t.	n.t.	3 min
MEN-07-04	*Erwinia carotovora pv. atroseptica*	3 min	n.t.	n.t.	3 min
MEN-07-43	*Erwinia carotovora pv. atroseptica*	1 min	1 min	1 min	1, 2, 3, 5 min
MEN-07-04	*Erwinia carotovora pv. carotovora*	3 min	n.t.	n.t.	3 min
MEN-07-43	*Erwinia carotovora pv. carotovora*	1 min	1 min	1 min	1, 2, 3, 5 min
MEN-07-04	*Pseudomonas lachrymans*	3 min	n.t.	n.t.	3 min
MEN-07-04	*Pseudomonas putida*	3 min	n.t.	n.t.	3 min
MEN-07-03	*Pseudomonas solanacearum (= Ralstonia solanacearum)*	5 min	n.t.	n.t.	5, 15, 30 min
MEN-07-04	*Pseudomonas syringae*	3 min	n.t.	n.t.	3 min
MEN-07-35	Rifamycin-resistant strain of *Xanthomonas campestris pv. Pelargonii* (Suspension test)	1 min	n.t.	n.t.	1, 2, 3, 5 min
MEN-07-35	Rifamycin-resistant strain of *Xanthomonas campestris pv. pelargonii* (Smear onto RGH resp. YDC Agar)	1 min	n.t.	n.t.	1, 2, 3, 5 min
MEN-07-04	*Xanthomonas campestris pv. begoniae*	3 min	n.t.	n.t.	3 min
MEN-07-04	*Xanthomonas campestris pv. campestris*	3 min	n.t.	n.t.	3 min
MEN-07-04	*Xanthomonas campestris pv. pelargonii*	3 min	n.t.	n.t.	3 min
MEN-07-05	*Xanthomonas campestris pv. pelargonii*	5 min	n.t.	5 min	5 min, 4 h
MEN-07-40	*Xanthomonas campestris pv. pelargonii*	1 min	1 min	1 min	1, 2, 3 min

[13] Results were not actually different between testing with and without peat. Therefore only results with peat are reported here.
[14] Results for/of an untreated control were not stated.

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination (n.t. not tested)[13]			
		1 %	2 %	Ref. product	Time tested
Number of results 21		21	5		
# of tests Thereof: Reaching 100 % efficacy within 3 min		**16/16** **(100 %)**	**4/4** **(100 %)**	**4/4** **(100 %)**	
# of tests Thereof: Reaching 100 % efficacy within 5 min		**21/21** **(100 %)**	**5/5** **(100 %)**	**5/5** **(100 %)**	

Two trials conducted under more practical conditions are available. They support the results of the suspension tests on bacteria. 1 – 2 % concentrated MENNO Florades are sufficient to control bacteria. With exception of the disinfection of rubber (ru) and polyethylene (pe) surfaces an exposure time of 15 to 30 minutes was sufficient for various materials.

Table 6.1.3- 4: Bacteria: Results from tests on surfaces

* The efficacy was sufficient on surfaces with two exceptions: polyethylene & rubber.

Trial ID	Pathogen	Evaluation of efficacy Growth of Pest (Rating: Growth + / No growth — / not tested n.t.)			
		MENNO Florades		Ref. product Formaldehyde	Control (water)
		1 %	2 %	2 %	
MEN-07-42 GEP: no DE 2000 Germ carrier test	Pseudomonas solanacearum (= Ralstonia solanacearum)	15 min: — 30 min: — 60 min: —	15 min: — 30 min: — 60 min: —	15 min: — 30 min: — 60 min: —	Growth in all controls
MEN-07-47 GEP: no, CAN 2004 Disinfection of contaminated greenhouse surfaces	In this trial disinfectants were applied using a spray bottle until surface coupons were completely covered and then allowed to dry (15-30 minutes for fast drying conditions, 45-60 minutes for slow-drying conditions). Twelve surfaces have been tested: al = aluminum; co = concrete; cu = copper; ga = galvanized tin; gl = glass; pc = polycarbonate; pe = polyethylene; PVC = polyvinylchloride; ru = rubber; ss = stainless steel; st = steel; wo = wood.				
Results: 45-60 min = SLOW DRYING	C.michiganensis ssp. Michiganensis	60 min: —	60 min: —	Not tested	Growth in all controls
Results: 15 - 30 min = FAST DRYING	C.michiganensis ssp. Michiganensis	30 min: + pe, ru*	30 min: —	Not tested	Growth in all controls
Number of results 2		3	2	1	
# of results Thereof: Reaching at least 85 % efficacy		**2 /2** **(67 %)**	**3 /3** **(100 %)**	1 / 1 (100 %)	

Additionally, two results are available showing the effectiveness of MENNO-Florades for the use on small tools. Full efficacy against bacteria is reached within 3 minutes, tested either at 1 % or 1.5 %.

Table 6.1.3- 5: Bacteria: Summarized results of efficacy tests on small tools

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination		
		MENNO Florades		Time tested
		1 %	1.5 %	
MEN-07-12	E. amylovora (1st trial, 16.03.1998)	1 min	Not tested	1, 5, 30 min
MEN-07-12	E. amylovora (2nd trial, 19.03.1998)	1 min	Not tested	1, 5, 30 min
MEN-07-12	E. amylovora (3rd trial), 24.03.1998	1 min	Not tested	1, 5, 30 min
MEN-07-06	X. campestris pv. pelargonii	Not tested	2 min*	2 min

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination		
		MENNO Florades		Time tested
		1 %	1.5 %	
Number of results 4		3	1	
# of results Thereof: Reaching 100 % efficacy within 3 min		3/3 (100 %)	1/1 (99 %)*	

*1 % infected plants were observed

Summary of trials and conclusion

The suspension tests have shown that the complete efficacy is usually reached at 1 % within 3 minutes or 5 minutes, depending on the minimum tested disinfection time in the tests. The trials performed in the practice were not conducted with samplings after 3 or 5 minutes, but 15 to 60 minutes. These data were taken as minimum disinfection time for the tested pathogens.

Table 6.1.3- 6: Summary of trials with bacteria

Bacteria species tested	Test type	Results from testing		Minimum recommended concentration and exposure time for disinfection of fungi species	
		1%	2%	1%	2%
Agrobacterium tumefaciens	Suspension	1 min	1 min	1 min	1 min
Clavibacter michiganensis	Suspension	3 min	n.t.	5 min	5 min
Clavibacter michiganensis	Suspension	5 min	n.t.		
ssp. *michiganensis*	Suspension	5 min	5 min		
ssp. *sepedonicus*	Suspension	5 min	n.t.		
Erwinia amylovora	Suspension	3 min	n.t.	3 min	3 min
Erwinia carotovora pv. atroseptica	Suspension	3 min	n.t.	3 min	3 min
Erwinia carotovora pv. atroseptica	Suspension	1 min	1 min		
Erwinia carotovora pv. carotovora	Suspension	3 min	n.t.	3 min	3 min
Erwinia carotovora pv. carotovora	Suspension	1 min	1 min		
Pseudomonas lachrymans	Suspension	3 min	n.t.	3 min	3 min
Pseudomonas putida	Suspension	3 min	n.t.	3 min	3 min
Pseudomonas syringae	Suspension	3 min	n.t.	3 min	3 min
Pseudomonas solanacearum	Suspension	5 min	n.t.	15 min	15 min
= Ralstonia solanacearum	Germ carrier test	15 min	15 min		
*Xanthomonas campestris pv. pelargonii**	Suspension	1 min	n.t.	1 min	1 min
	Smear onto RGH resp. YDC Agar)	1 min	n.t.		
Xanthomonas campestris pv. begoniae	Suspension	3 min	n.t.	3 min	3 min
Xanthomonas campestris pv. campestris	Suspension	3 min	n.t.	3 min	3 min
Xanthomonas campestris pv. pelargonii	Suspension	3 min	n.t.	5 min	5 min
Xanthomonas campestris pv. pelargonii	Suspension	5 min	n.t.		
Xanthomonas campestris pv. pelargonii	Suspension	1 min	1 min		
C.michiganensis ssp. michiganensis	Disinfection of contaminated greenhouse surfaces	60 min	30 min	60 min	30 min

*Rifamycin-resistant strain

To reduce the number of uses in the application, and according to the practice, bacteria and fungal harmful organisms are usually disinfected at the same time. Therefore, a maximum disinfected time of 16

hours is applied for the 1 % solution and 4 hours for the 2 % solution of MENNO Florades, which are the necessary to control the fungal harmful organisms.

When only bacteria are to be controlled, shorter times will be recommended in the label, which reflect the results in more detail.

IIIA1 6.1.3.2 Control of fungal harmful organisms

Only in exceptional cases the application rate/ha is given in the test reports, because under the practical conditions not applicable and the concentration and exposure time to the spray solution is relevant. Therefore, all results are presented accordingly.

Intended GAP for Fungal harmful organisms

Crop and/or situation (crop destination / purpose of crop)	**F G or I**	**Application techniques**		**Maximum desinfection concentration (time)**
		Method / Kind	Max. number (min. interval between applications) a) per use b) per crop/ season	
Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Directed coarse spray or foaming (lathering)	a) 1 b) not applicable	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Watering	a) 1 b) not applicable	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Flooding	a) 1 b) not applicable	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Dipping	a) 1 b) not applicable	4 % - 3 min No direct treatment of plants, soil or substrates. Only for disinfection.

Material and methods

Mainly suspension tests are available with fungi. Besides the suspension tests a limited number of results are available when MENNO Florades has been tested under more practical conditions.

Table 6.1.3- 7: Fungi: Available trials for evaluation of the efficacy

	Suspension tests	**Practical tests**	**Thereof: GEP / Guideline**
Germany, Switzerland, UK, Canada (relevant for all EPPO zones because only indoor or greenhouse uses are intended)	7 tests with 21 results of different (sub-)species	Surfaces*: 3 tests with 7 results of different (sub-)species	GEP: 8 results Guideline: 15 results

Total # of results	**21**	**7**	**8 GEP & Guideline**

*"Surfaces" are understood as e.g. trays, benches, tables, containers, room walls, equipment, machines
**'small tools" are understood as e.g. knives or other cutting tools

Results

Sixteen hours of exposure to 1 % MENNO Florades result in complete disinfection in 95 % of the trials. MENNO Florades at a concentration of 2 % is sufficient for complete disinfection in all trials with an exposure time of 4 hours. The reference product shows comparable results: a concentration of 1 % is sufficient for complete disinfection after 4 hours of exposure in 90 % of the trials and 4 hours of exposure to 2 % reference product result in complete disinfection in 100 % of the trials.

Table 6.1.3- 8: Fungi: Summarized results of suspension tests

Trial ID	**Pest**	**100 % efficacy reached at following concentration / time combination Growth of Pest (Rating: Growth + / No growth — / not tested n.t.)[15]**				
		MENNO Florades		**Reference product**		**Tested times**
		1 %	**2 %**	**1 %**	**2 %**	
MEN-07-44	'Erikenpilz' (unidentified pathogenic fungi on *Erica gracilis*)	60 min	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-40	*Alternaria* sp.	4 h	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-40	*Botrytis cinerea*	60 min	60 min	4 h	n.t.	60 min, 4 h, 16 h
MEN-07-47[16]	*Botrytis cinerea*	> 5 min	< 5 min	> 5 min	< 5 min	Not specified
MEN-07-40	*Colletotrichum* sp.	60 min	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-40	*Cylindrocladium scoparium*	4 h	4 h	+	n.t.	60 min, 4 h, 16 h
MEN-07-41	*Dactylium dendroides*	60 min	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-47	*Didymella bryoniae*	< 5 min	< 5 min	> 30 min	> 5 min	Not specified
MEN-07-38	*Fusarium oxysporum*	16 h	4 h	30 min	n.t.	30 min, 60 min, 4 h, 16 h
MEN-07-39	*Fusarium oxysporum f.*sp. *cyclaminis*	16 h	60 min	60 min	n.t.	30 min, 60 min, 4 h, 16 h
MEN-07-40	*Fusarium oxysporum f.*sp. *cyclaminis*	4 h	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-43	*Fusarium solani var. coeruleum*	60 min	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-47	*Fusarium* ssp.	< 5 min	< 5 min	< 5 min	< 5 min	Not specified
MEN-07-43	*Helminthosporium solani*	60 min	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-40	*Mucor* sp.	> 16 h	60 min	+	n.t.	60 min, 4 h, 16 h
MEN-07-40	*Phytophthora cinnamomi*	60 min	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-47	*Pythium aphanidermatum*	< 5 min	< 5 min	< 5 min	< 5 min	Not specified
MEN-07-40	*Rhizoctonia solani*	4 h	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-40	*Thielaviopsis basicola*	4 h	60 min	60 min	n.t.	60 min, 4 h, 16 h
MEN-07-41	*Trichoderma viride*	16 h	4 h	4 h	n.t.	60 min, 4 h, 16 h
MEN-07-41	*Verticillium fungicola*	60 min	60 min	4 h	n.t.	60 min, 4 h, 16 h
Number of results 21		21	21	21	4	Field of application
# of tests Thereof: Reaching 100 % efficacy within 4 hours		Not intended for the GAP	**21/21 (100 %)**	--	4/4 (100 %)	Intended use: Treatment of surfaces
# of tests Thereof: Reaching 100 % efficacy within 16 hours		**20/21 (95 %)**	**21/21 (100 %)**	19/21 (90 %)	4/4 (100 %)	

[15] Results were not actually different between testing with and without peat. Only results with peat are summarized here.
[16] Eight reference products were tested in MEN-07-47. In this table only the most efficient was chosen.

These results are confirmed by tests performed under more practical conditions. They as well showed that full control of fungal harmful organisms is achieved at 1 – 2 % MENNO-Florades.

Table 6.1.3- 9: Fungi: Results from tests on surfaces

Trial ID	**Pathogen**	**Evaluation of efficacy Growth of Pest (Rating: Growth + / No growth — / not tested n.t.)**			
		MENNO Florades		**Ref. product MENNO TER forte**	**Control**
		1 %	**1.5 or 2 %**	**1 %**	
MEN-07-07 GEP: Yes, DE 1995 Disinfection of trays GEP : No	*Cylindrocladium spathiphylli*	+ (19 % infested plants, i.e. less than 85 % efficacy)	Not tested	— (6 % infested plants, i.e. 94 % efficacy)	Infestation in 73 % of controls
MEN-07-07 GEP: Yes, DE 1995 Disinfection of growing containers GEP: No	*Cylindrocladium spathiphylli*	—	Not tested	— (8 % infested plants, i.e. 92 % efficacy)	Infestation in 50 % of controls[17]
MEN-07-47 GEP: no, CH 1998 Disinfection of contaminated greenhouse surfaces	In this trial disinfectants were applied using a spray bottle until surface coupons were completely covered and then allowed to dry (45-60 minutes for slow-drying conditions). Twelve surfaces have been tested. al = aluminum; co = concrete; cu = copper; ga = galvanized tin; gl = glass; pc = polycarbonate; pe = polyethylene; PVC = polyvinylchloride; ru = rubber; ss = stainless steel; st = steel; wo = wood. + with abbreviations designates incomplete disinfection on surfaces indicated.				
Results: SLOW DRYING	B. cinerea	—	—	Not tested	Growth in all controls
	D. bryoniae	—	—	Not tested	Growth in all controls
	Fusarium sp.	—	—	Not tested	Growth in all controls
	P. aphanidermatum	—	—	Not tested	Growth in all controls
	P. aphanidermatum	—	—	Not tested	Growth in all controls
Number of results 7		7	5	2	
# of results Thereof: Reaching at least 85 % efficacy		**6 / 7** **(86 %)**	**5 / 5** **(100 %)**	2 / 2 (100 %)	

* There was also data on fast drying (15-30 min). The efficacy was not sufficient on all surfaces in case of fast drying conditions.

Summary of trials and conclusion

Total control of fungi has been achieved at 2 % MENNO Florades after 4 hours exposure, but the bulk of species (exception: Mucor sp.) may also be controlled at 1 % after 16 hours exposure. However, these are maximum disinfection times and less exposure may also lead to full control of some species.

Table 6.1.3- 10: Summary of trials with fungi

Fungi species tested	**Test type**	**Results from testing**	**Minimum recommended concentration and exposure time for disinfection of fungi species**

[17] According to the BBA-guideline 16-4 and the EPPO-guideline PP 1/261surfaces or equipment must be contaminated to such a degree that a sufficient number of plants (preferably at least 30 %) in the untreated, contaminated control become infected.

		1%	2%	1%	2%
unidentified pathogenic fungi on *Erica gracilis*	1 suspension test	60 min	60 min	1 h	1 h
Botrytis cinerea	1 disinfection test performed on greenhouse surfaces and 2 suspension tests	< 60 min 60 min < 5 min	< 60 min 60 min < 5 min	1 h	1 h
Colletotrichum sp.	1 suspension test	60 min	60 min	1 h	1 h
Didymella bryoniae	1 disinfection test performed on greenhouse surfaces, 1 suspension test	< 60 min < 5 min	< 60 min < 5 min	1 h	1 h
Dactylium dendroides	1 suspension test	60 min	60 min	1 h	1 h
Helminthosporium solani	1 suspension test	60 min	60 min	1 h	1 h
Pythium aphanidermatum	2 disinfection tests performed on greenhouse surfaces, 1 suspension test	< 60 min < 5 min	< 60 min < 5 min	1 h	1 h
Phytophthora cinnamomi	1 suspension test	60 min	60 min	1 h	1 h
Verticillium fungicola	1 suspension test	60 min	60 min	1 h	1 h
Alternaria sp.	1 suspension test	4 h	60 min	4 h	1 h
Rhizoctonia solani	1 suspension test	4 h	60 min	4 h	1 h
Thielaviopsis basicola	1 suspension test	4 h	60 min	4 h	1 h
Cylindrocladium spathiphylli	1 disinfection test with trays, 1 disinfection test with containers	> 60 min < 60 min	Not tested Not tested	16 h	4 h
Cylindrocladium scoparium	1 suspension test	4 h	4 h	See *C. spathiphylli*	See *C. spathiphylli*
Trichoderma viride	1 suspension test	16 h	4 h	16 h	4 h
Fusarium oxysporum	4 suspension tests	60 min 4 h 16 h 16 h	60 min 60 min 60 min 4 h	16 h	4 h
Fusarium sp.	1 disinfection test performed on greenhouse surfaces, 1 suspension test	< 60 min < 5 min	< 60 min < 5 min	See *Fusarium oxysporum*	See *Fusarium oxysporum*
Mucor sp.	1 suspension test	> 16 h	60 min	16 h	4 h

IIIA1 6.1.3.3 Control of viruses and viroids

Only in exceptional cases the application rate/ha is given in the test reports, because under the practical conditions not applicable and the concentration and exposure time to the spray solution is relevant. Therefore, all results are presented accordingly.

Intended GAP for viruses and viroids (other than tobamoviruses)

Crop and/or situation (crop destination / purpose of crop)	**F G or I**	**Application techniques**		**Maximum desinfection concentration (time)**
		Method / Kind	Max. number (min. interval between applications) a) per use b) per crop/ season	

Crop and/or situation (crop destination / purpose of crop)	F G or I	Application techniques		Maximum desinfection concentration (time)
		Method / Kind	Max. number (min. interval between applications) a) per use b) per crop/ season	
Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Directed coarse spray or foaming (lathering)	a) 1 b) not applicable	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Watering	a) 1 b) not applicable	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Flooding	a) 1 b) not applicable	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Dipping	a) 1 b) not applicable	4 % - 3 min No direct treatment of plants, soil or substrates. Only for disinfection.

Material and methods

Usually, viruses and viroids are more difficult to control than bacteria or fungi. Therefore, a lot of more tests have been conducted under more practical conditions than the inoculum tests on plants. In total, 31 results are available for viruses and viroids.

Table 6.1.3- 11: Viruses and viroids: Available trials for evaluation of the efficacy

	Inoculum tests on plants	Practical tests	Thereof: GEP / Guideline
Germany, Switzerland, UK (relevant for all EPPO zones)	4 tests with 8 results of different (sub-)species	Surfaces*: 3 tests with 9 results of different (sub-)species Small tools**: 9 tests with 14 results of different (sub-)species	GEP: 0 results Guideline: No guideline at time of test performance
Total # of results	**8**	**23**	**0 GEP**

*"Surfaces" are understood as e.g. trays, benches, tables, containers, room walls, equipment, machines
**'small tools" are understood as e.g. knives or other cutting tools

The supportive trials, reporting only the disinfection concentration but not the disinfection time have not been repeated here. Please refer to the chapter 6.1.2.

Results

Data from inoculums tests have been already presented under 6.1.2. The results of these tests have shown that inactivation concentration and exposure depends very much on virus species/type. The practical tests are presented in the following:

- **Efficacy of MENNO Florades on surfaces:**

Table 6.1.3- 12: Viruses and viroids: Efficacy in tests on surfaces

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination Rating: i no effect, incomplete or no virus inactivation; exposure time needed for disinfection (s = seconds; min = minutes; h = hour) n.t. = not tested			
		MENNO Florades			Tested times
		1 %	2 %	4 %	
MEN-07-21	*Arabis mosaic nepovirus*	n.t.	5 min	Not stated or tested, full inactivation achieved at 2 % 5 minutes.	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-21	*Cymbidium mosaic potex-virus*	n.st.	30 min	Not stated or tested, full inactivation achieved at 2 % 30 minutes.	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-13	*Cymbidium mosaic virus*	4 h	4 h	4 h	30 min, 1, 2, 3, 4, 8, 12, 14 h
MEN-07-21	*Pelargonium flower break carmovirus*	16 h	Not stated or tested, full inactivation achieved at 1 % 16 hours.	Not stated or tested, full inactivation achieved at 1 % 16 hours.	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-21	*Pelargonium leaf curl tombusvirus*	10 s	Not tested, full inactivation already achieved at 1 % 10 seconds	Not tested, full inactivation achieved at 1 % 10 seconds	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-21	*Pelargonium line pattern virus*	n.st.	1 min	Not stated or tested, full inactivation achieved at 2 % 1 min.	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-21	*Pepino mosaic potexvirus*	n.st.	8 h	Not stated or tested, full inactivation achieved at 2 % 8 hours	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-20	*Tobacco streak virus*	n.t.	30 min	Not stated or tested, full inactivation achieved at 2 % 30 min.	5, 30 min, 1, 5 h
MEN-07-21	*Tobacco mosaic tobamovirus*	i	i	16 h **	10 s, 1, 5 min, 1, 4, 16 h
MEN-07-21	*Tomato spotted wilt tospovirus*	4 h	Not stated or tested, full inactivation achieved at 1 % 4 hours.	Not stated or tested, full inactivation achieved at 1 % 4 hours.	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
Number of results 10		5	10	10	
# of results Thereof: Reaching 100 % efficacy within 4 hours		3/5 (60 %)	**8/10** **(80 %)**	**8/10** **(80 %)**	
# of results Thereof: Reaching 100 % efficacy within 16 hours		4/5 (80 %)	**9/10** **(90 %)**	**10/10** **(90 %)**	

* = 4 hours not tested ** only effective if tables are rinsed with water before

- **Efficacy of MENNO Florades on tools:**

Table 6.1.3- 13: Viruses and viroids: Summary of efficacy in test with on tools

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination Rating: i no effect, incomplete or no virus inactivation; exposure time needed for disinfection (s = seconds; min = minutes; h = hour) n.t. = not tested			
		MENNO Florades			Tested times
		1 %	2 %	4 %	

Trial ID	Pathogen	100 % efficacy reached at following concentration / time combination Rating: i no effect, incomplete or no virus inactivation; exposure time needed for disinfection (s = seconds; min = minutes; h = hour) n.t. = not tested			
		MENNO Florades			Tested times
		1 %	2 %	4 %	
MEN-07-21	*Arabis mosaic nepovirus*	i	5 min	30 s	10 s to 5 min (no more specified)
MEN-07-18	*Bell Pepper mottle Virus*	i	i	30 s	10, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-17	*Chrysanthemum stunt viroid*	n.t.	1 min	n.t.	10 s, 30 s, 1 min
MEN-07-21	*Cymbidium mosaic potex-virus*	i	i	30 s	10 s to 5 min (no more specified)
MEN-07-13	*Cymbidium mosaic virus*	i	i	30 s	30 s, 1, 2, 4, 5, 6, 10, 30 min
MEN-07-18	*Melon necrotic spot virus*	i	30 s	10 s	10, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-13	*Odontoglossum ring spot virus*	i	i	30 s	30 s, 1, 2, 4, 5, 6, 10, 30 min
MEN-07-21	*Odontoglossum ringspot tobamovirus*	i	i	30 s	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-21	*Pelargonium flower break carmovirus*	i	i	30 s	10 s to 5 min (no more specified)
MEN-07-21	*Pelargonium leaf curl tombusvirus*	< 10 s	30 s	30 s	10 s to 5 min (no more specified)
MEN-07-21	*Pepino mosaic potexvirus*	i	i	30 s	10 s to 5 min (no more specified)
MEN-07-16	*Pepino mosaic virus*	i	4 min	30 s	10, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-15	*Potato spindle tuber viroid*	i	1 min	n.t.	10 s, 30 s, 1 min
MEN-07-34	*Potato spindle tuber viroid*	2 min	n.t.	n.t.	2, 5, 10 min
MEN-07-20	*Tobacco streak virus*	n.t.	10 min	3 min	1, 3, 5, 10 min
MEN-07-04	*Tobacco mosaic tobamovirus*	i	i	3 min	3 min
MEN-07-21	*Tobacco mosaic tobamovirus*	i	i	5 min[18]	10, 30 s, 1-6, 10, 30 min, 1-4, 8, 14, 16 h
MEN-07-21	*Tomato spotted wilt tospovirus*	< 10 s	30 s	30 s	10 s to 5 min (no more specified)
MEN-07-18	*Zucchini yellow mosaic virus (on cucumber)*	i	1 min	30 s	10, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
MEN-07-18	*Zucchini yellow mosaic virus (on pumpkin)*	i	30 s	30 s	10, 30 s, 1, 2, 4, 5, 10, 30 min, 1, 8, 16 h
Number of results 20		18	19	18	
# of results Thereof: Reaching 100 % efficacy within 3 min		3/18 (23 %)	7/19 (37 %)	**17/17[19] (100 %)**	
# of results Thereof: Reaching 100 % efficacy within 5 min		3/18 (23 %)	9/19 (47 %)	**18/18 (100 %)**	

Summary of trials and conclusion

According to the following overview, generally 1 % concentration of Menno Florades should be combined with at least 16 hours disinfection time, 2 % with 8 hours and 4 % with 1 hours for surfaces and 3

[18] Incubation time less than 5 min was not possible.

[19] Please see footnote 21. In one of the tests an incubation time less than 5 minutes was not possible, therefore this test cannot be regarded.

minutes for small tools. There are few exceptions, i.e. need an extended time at 4 %, this should be stated on the label.

Please regard: The above mentioned timing are representing the minimum time for disinfection and will be recommended in the label, whereas in the uses for product application maximum times will be defined to unify the uses.

A proposal for classification of the viruses and viroids is made under point 6.1.3.4 (conclusion). The proposal is based on the following table.

Table 6.1.3- 14: Summary of trials with viruses and viroids

Pathogen	Trial ID tot = test on tool sf = surface test it = inoculum test	Results from testing i = incomplete (max. testing time) n.t. = not tested, n.st. = not stated			Minimum recommended concentration and exposure time for inactivation of virus and viroid species		
		1 %	2 %	4 %	1 %	2 %	4 %
Arabis mosaic nepovirus	MEN-07-21, sf	n.t.	5 min	2 % 5 min.	Not tested	1 hour	1 hour for surfaces, 30 min for tools
	MEN-07-21, tot	i (5 min)	5 min	30 s			
Bell Pepper mottle Virus	MEN-07-18, it	i (16 h)	i (16 h)	30 s	--	--	1 hour for surfaces, 30 min for tools
	MEN-07-18 , tot	i (16 h)	i (16 h)	30 s			
Chrysanthemum stunt viroid	MEN-07-17 , tot	n.t.	1 min	2 % 1 min.	--	1 hour	1 hour for surfaces, 30 min for tools
	MEN-07-17 , it	n.t.	1 min	30 s at 3 %			
Cymbidium mosaic virus	MEN-07-21 , sf	n.st.	30 min	2 % 30 min.	4 hours	4 hours	4 hours for surfaces, 30 min for tools
	MEN-07-21 , tot	i (5 min)	i (5 min)	30 s			
	MEN-07-13 , sf	4 h	4 h	4 h			
	MEN-07-13 , tot	i (30 min)	i (30 min)	30 s			
Melon necrotic spot carmovirus	MEN-07-18 , it	i (16 h)	2 min	10 s	--	1 hour	1 hour for surfaces, 30 min for tools
	MEN-07-18 , tot	i (16 h)	30 s	10 s			
Odontoglossum ringspot tobamovirus	MEN-07-13 , tot	i (30 min)	i (30 min)	30 s	--	--	1 hour for surfaces, 30 min for tools
	MEN-07-21 , tot	i (16 h)	i (16 h)	30 s			
Pelargonium flower break carmovirus	MEN-07-21 , sf	16 h	1 % 16 hours.	1 % 16 hours.	16 hours	8 hours	1 hour for surfaces, 30 min for tools
	MEN-07-21 , tot	i (5 min)	i	30 s			
Pelargonium leaf curl tombusvirus	MEN-07-21 , sf	10 s	1 % 10 seconds	1 % 10 seconds	1 hour	1 hour	1 hour for surfaces, 30 min for tools
	MEN-07-21 , tot	< 10 s	30 s	30 s			
Pelargonium line pattern virus	MEN-07-21 , sf	n.st.	1 min	2 % 1 min.	--	1 hour	1 hour for surfaces, 30 min for tools
Pepino mosaic potexvirus	MEN-07-21 , sf	n.st.	8 h	2 % 8 hours	--	8 hours	1 hour for surfaces, 30 min for tools
	MEN-07-21 , tot	i (5 min)	i (5 min)	30 s			
	MEN-07-16 , tot	i (16 h)	4 min	30 s			
	MEN-07-16 , it	i (16 h)	8 h	10 s			
Pepper mild mottle tobamovirus (PMMoV) - Tobamovirus	MEN-07-18 , it	i (16 h)	i (16 h)	30 s	--	--	1 hour for surfaces, 30 min for tools

Pathogen	Trial ID tot = test on tool sf = surface test it = inoculum test	Results from testing i = incomplete (max. testing time) n.t. = not tested, n.st. = not stated			Minimum recommended concentration and exposure time for inactivation of virus and viroid species		
		1 %	2 %	4 %	1 %	2 %	4 %
Potato spindle tuber viroid	MEN-07-34 , tot	2 min	n.t.	n.t.	1 hour	1 hour	1 hour for surfaces, 30 min for tools
	MEN-07-15 , tot	i (1 min)	1 min	n.t.			
	MEN-07-15 , it	i (1 min)	1 min	10 s at 3 %			
Tobacco mosaic tobamovirus	MEN-07-04 , tot	i (3 min)	i (3 min)	3 min	--	--	16 hours for surfaces, 30 min for tools
	MEN-07-21 , sf	i (16 h)	i (16 h)	16 h **			
	MEN-07-21 , tot	i (16 h)	i (16 h)	5 min[20]			
Tobacco streak virus	MEN-07-20 , sf	n.t.	30 min	2 % 30 min.	16 hours	16 hours	1 hour for surfaces, 30 min for tools
	MEN-07-20 , tot	n.t.	10 min	3 min			
	MEN-07-20 , it	i (30 min)	i (30 min)	5 min			
	MEN-07-20 , it	7 h	16 h	n.t.			
Tomato spotted wilt tospovirus	MEN-07-21 , sf	4 h	1 % 4 hours.	1 % 4 hours.	4 hours	1 hour	1 hour for surfaces, 30 min for tools
	MEN-07-21 , tot	< 10 s	30 s	30 s			
Zucchini yellow mosaic potyvirus	MEN-07-18 , it	i (16 h)	1 h	10 s	--	8 hours	1 hour for surfaces, 30 min for tools
	MEN-07-18 , it	i (16 h)	8 h	10 s			
	MEN-07-18 , tot	i (16 h)	1 min	30 s			
	MEN-07-18 , tot	i (16 h)	30 s	30 s			

** only effective if tables are rinsed with water before

Table 6.1.3-14: In the right column the exposure time for tools must be 3 min instead of 30 min. MEN-07-21 is a publication of MEN-07-13 and other results. It should not be counted twice for CyMV and ORSV. For CyMV the shortest times for inactivation on surfaces were 4 h at 1% and 30 min at 2% and 4% instead of 4 h at 2 or 4%. For ORSV the shortest time for inactivation on surfaces according to MEN-07-13 were 14 h at 2% and 30 min at 4%.

IIIA1 6.1.3.4 Overall conclusion

Bacteria:

Against bacteria, the suspension tests have shown that the complete efficacy is usually reached at 1 % within 3 minutes or 5 minutes, depending on the minimum tested disinfection time in the tests. The trials performed in the practice were not conducted with samplings after 3 or 5 minutes, but 15 to 60 minutes. These data were taken as minimum disinfection time for the tested pathogens.

To reduce the number of uses, and according to the practice, bacteria and fungi are usually disinfected at the same time. Therefore, a maximum disinfected time of 16 hours is applied for the 1 % solution and 4 hours for the 2 % solution of MENNO Florades.

Fungi:

Total control of fungi has been achieved at 2 % MENNO Florades after 4 hours exposure, but the bulk of species (exception: Mucor sp.) may also be controlled at 1 % after 16 hours exposure. Based on these results, following rates are proposed:

[20] Incubation time less than 5 min was not possible.

- Control at 1 % MENNO Florades: 16 hours disinfection OR
- Control at 2 % MENNO Florades: 4 hours disinfection

Viruses and viroids:

For the control of viruses and viroides generally 1 % concentration of Menno Florades should be combined with at least 4 hours disinfection time, 2 % with 8 hours and 4 % with 1 hour for surfaces and 3 minutes for small tools. There are few exceptions, i.e. need an extended time at 4 %, this should be stated on the label. A proposal was made to classify the viruses and viroids and to group them into the above mentioned scheme:

Table 6.1.3- 15: Classification of viruses and viroids

Pathogen	Minimum recommended concentration and exposure time for inactivation of virus and viroid species		
	1 %	**2 %**	**4 %**
Viruses and viroids: Easy to inactivate (maximum for the product application: 1 %, max. 16 hours)			
Pelargonium leaf curl tombusvirus	1 hour	1 hour	1 hour
Potato spindle tuber viroid	1 hour	1 hour	1 hour
Arabis mosaic nepovirus	Not tested	1 hour	1 hour
Chrysanthemum stunt viroid	Not tested	1 hour	1 hour
Pelargonium line pattern virus	Not tested	1 hour	1 hour
Tomato spotted wilt tospovirus	4 hours	1 hour	1 hour
Cymbidium mosaic virus	4 hours	4 hours	4 hours
Viruses and viroids: Not easy to inactivate (maximum for the product application: 2 %, max. 16 hours)			
Melon necrotic spot carmovirus	No incativation within 16 h	1 hour	1 hour
Pepino mosaic potexvirus	No incativation within 16 h	8 hours	1 hour
Zucchini yellow mosaic potyvirus	No incativation within 16 h	8 hours	1 hour
Pelargonium flower break carmovirus	16 hours	8 hours	1 hour

Pathogen	Minimum recommended concentration and exposure time for inactivation of virus and viroid species		
	1 %	2 %	4 %
Viruses and viroids: Difficult to inactivate (maximum for the product application: 4 %, max 16 hours)			
Tobacco streak virus	16 hours	16 hours	1 hour
Bell Pepper mottle Virus	No incativation within 16 h	No incativation within 16 h	1 hour
Odontoglossum ringspot tobamovirus	No incativation within 16 h	No incativation within 16 h	1 hour
Pepper mild mottle tobamovirus	No incativation within 16 h	No incativation within 16 h	1 hour
Tobacco mosaic tobamovirus	No incativation within 16 h	No incativation within 16 h	16 hours

Label proposal:

For disinfection: No direct treatment of plants or plant products

Thoroughly wash all surfaces and equipment to remove all deposits and organic material before treatment. Dilute MENNO Florades® with water at the required rates according to target organism(s) as set out in the table.

Table 6.1.2- 10: Proposed minimum MENNO Florades concentrations against bacterial, fungal and viral diseases

Application area	Application technique	Pests	Dilution	Minimum time for efficient disinfection	Maximum time (as applied for the product application)**
Protected rooms (Greenhouse, Indoor) in agriculture, horticulture and floriculture, disinfection of surfaces, tools and culture vessels/containers, no direct treatment on plants/crops	Directed coarse spray, foaming (lathering), watering (pouring of aqueous solution or foam), flooding	Viruses and viroids easy to inactivate*	1 %	4 hours	16 hours
		Viruses and viroids easy and not easy to inactivate*	2 %	8 hours	16 hours
		All viruses and viroids with exception of Tobacco mosaic tobamovirus*	4 %	1 hour	16 hours
		Tobacco mosaic tobamovirus	4 %	16 hours	16 hours
		Fungi plus bacteria with exception of Mucor	1 %	16 hours	16 hours
		All fungi plus bacteria	2 %	4 hours	16 hours
		Bacteria only	1 % OR 2 %	1 hour OR 0.5 hours	16 hours
Small tools (cutter, knives, secateurs etc.)	Dipping (replace dip daily)	Viruses, viroides, fungi, bacteria	4 %	3 min	3 min

* Please see list of virusses beneath

** This column is not thought for the label.

Diseases controlled

Fungi (including permanent mould): *Alternaria*, *Aspergillus*, *Botrytis*, *Cercospora*, *Chalara*, *Colletotrichum*, *Cylindrocladium*, *Dactylium*, *Didymella*, *Erysiphe*, *Fusarium*, *Helminthosporium*, *Mucor*, *Ophiostoma*, *Peronospora*, *Pythium*, *Phytophthora*, *Ramularia*, *Rhizoctonia*, *Rhizopus*, *Thielaviopsis*, *Trichoderma*, *Verticillium*, etc.

Bakteria: *Acidovorax*, *Agrobacterium*, *Clavibacter*, *Erwinia*, *Pseudomonas*, *Ralstonia*, *Xanthomonas*, etc

Virusses and Viroids:

Easy to inactivate	**Not easy to inactivate**	**Difficult to inactivate**
Pelargonium leaf curl tombusvirus	Melon necrotic spot carmovirus	Tobacco streak virus
Potato spindle tuber viroid	Pepino mosaic potexvirus	Bell Pepper mottle Virus
Arabis mosaic nepovirus	Zucchini yellow mosaic potyvirus	Odontoglossum ringspot tobamovirus
Chrysanthemum stunt viroid	Pelargonium flower break carmovirus	Pepper mild mottle tobamovirus
Pelargonium line pattern virus		Tobacco mosaic tobamovirus
Tomato spotted wilt tospovirus		
Cymbidium mosaic virus		

Conclusion:

In general, disinfection depends on the combination of the concentration of the disinfectant and the exposure time. A higher concentration generally allows a reduced exposure time and vice versa. This allows adaption of the used concentrations and exposure times to the practical background. In the production of cuttings for propagation, for example, knives must be disinfected repeatedly in a short time span. Disinfection of tables on the other hand can possibly be done overnight.
MENNO Florades was tested against various plant pathogens of different crops in horticulture and agriculture. Therefore the use of the disinfectant in these areas can be justified.

Bacteria/surfaces

Suspension tests on bacteria showed complete control after 3-5 minutes of exposure to 1% MENNO Florades. A test from Canada on disinfection of contaminated greenhouse surfaces showed insufficient control of *Clavibacter michiganensis* ssp. *michiganensis* under fast drying conditions on polyethylene and rubber after an exposure time of 30 minutes at 1%. Control was achieved after 30 minutes at 2% and under slow drying conditions at 60 min/1% and 60 min/2%. This trial is considered only as supportive because it was not carried out by one of the European member states.
According to the GAP-table for EU (except Germany) a concentration of 1% (max. 16h) or 2% (max. 4h) for disinfection against bacteria and fungi is necessary. The wording “max. 16h” and “max 4h” should be understood like control will be achieved at the latest after 16h and 4h, respectively. No disadvantages for efficacy are expected if a longer exposure time is used. The trial results on bacteria fit all within the concentrations and exposure times in the GAP-table and are therefore accepted. Advice may be given in the instructions for use, that the exposure time can be further reduced if disinfection is intended only against bacteria. But it should be kept in mind that in most cases only one or two trials were performed on the same species. Therefore it might be risky to reduce the exposure time to the minimum given in the trial results like in the label proposal above. The decision should be up to the member states.

Fungi/surfaces

Disinfection against fungi was completed at the latest after 16 hours of exposure to 1% MENNO Florades (except *Mucor* sp.) or 4 hours/2% of the disinfectant. In trial MEN-07-07 against *Cylindrocladium spathiphyllum* complete disinfection was not achieved. In this trial contaminated trays were roughly cleaned and afterwards dipped for 4 hours in a 1% solution of MENNO Florades. Thorough cleaning followed by a longer exposure time might have led to complete disinfection. Therefore the negative result under worse conditions should not be overrated. The claim for disinfection after 16h (at the latest) at 1% or 4h (at the latest) at 2% is sufficiently supported by trials.

Viruses and virus like organisms/surfaces

The Tobacco mosaic tobamovirus (TMV) turned out to be the most difficult virus to inactivate among the tested organisms. Only after thorough cleaning the virus could be controlled by 4% MENNO Florades and an exposure time of 16 hours. For other viruses/viroids disinfection could already be achieved at lower concentrations and/or exposure times. A classification of the viral pathogens according to the dif-

ficulty for their inactivation as intended for Germany is possible (see GAP-table for Germany) as well as advice on reduced concentrations/exposure times in the instructions for use. But it should be kept in mind that in most cases only one trial per virus/viroid was performed. Therefore it might be risky to reduce the exposure time to the minimum given in the trial results like in the label proposal above. The decision on a classification of viruses for treatment with different concentrations and/or additional advice on concentrations/exposure times in the instructions should be up to the member states.

Bacteria, fungi, viruses and viroids/small tools:

Only a short time exposure is suitable for disinfection of small tools. Disinfection of small tools was successfull for all tested pathogens at 3 min exposure to 4% MENNO Florades (tab. 6.1.3-5 and 6.1.3-13). These tests included TMV which is difficult to inactivate and can therefore be considered as the worst case. The claim for disinfection of small tools according to the GAP-table (3min/4%) is supported by the trials.

Reference products:

In most countries disinfectants were not registered as plant protection products but belonged to biocides. Therefore nearly no reference products were available. Information on standards is given in table 6.1.3-1. In trials with reference products the efficacy between MENNO Florades and the reference were generally comparable.

IIIA1 6.1.4 Effects on yield and quality

The objective of the application of MENNO Florades is primilary to improve the plant quality by improving hygienic standards. Although the intended use of MENNO Florades does not content direct treatment of plants, plant parts or plant products so far, a future extension of the intended use may include the treatment of potato tubers. Therefore the effectiveness of MENNO Florades as a fungicide and bacteriocide against *Helminthosporium solani*, *Colletotrichum coccodes*, *Rhizoctonia solani* and *Erwinia spp.* in potato was examined. Results of this examination are partly described under the following points in order to demonstrate the effects of MENNO Florades on the qualitity (starch content, size fraction of the harvested potatoes and taste and flavour of previously treated potatoes) and the yield of potatoes (field emergence and yield after planting of previously disinfected and afterwards stored potato tubers). **These trials are also relevant for the treatment of the storage rooms and boxes/containers for potatoes.**

IIIA1 6.1.4.1 Impact on the quality of plants and plant products

Although plants or plant products are not directly treated, the use as fungicide and bacteriocide within a future extension of the intended use may contain the treatment of potato tubers. In this context the effect on the ingredient ´starch´, the size fraction of the harvested potatoes and taste and flavour of previously treated potatoes was examined. Furthermore within another trial the effect of treatment of potato tubers on their taste and flavour was examined. Finally the effect on the sprout development of treated potato tubers was examined within 5 trials. A summary of the observations is presented in table 6.1.4- 1.

In one trial (MEN-07-64) possible effects of a treatment of potato tubers with MENNO Florades to starch content and the size fraction of the harvested potatoes of the subsequent harvest were determined. This trial has also been used to evaluate possible effects of a treatment of potato tubers with MENNO Florades before storage and later planting to the yield (refer to IIIA1 6.1.4.3)

Table 6.1.4- 1: Effects of a treatment of potato tubers with MENNO Florades (MEN-07-64, Eckendorf)

Trial IDLoca-		

tion		Control	MENNO Florades	Reference products			
				Monceren liquid	Monceren Plus	Proradix WG	Dithane Ultra Spiess
Starch content [%]	**[%]**	19.9	18.4	19.4	19.3	18.1	19.8
Size fraction of the harvested potatoes	small	3	2	3	1	1	1
	medium	55	53	47	29	49	32
	tall	42	45	51	69	50	67

There is no indication that a treatment of potato tubers has an effect of ingredients like starch. Although the starch content after treatment with MENNO Florades appeared slightly lower compared to the control, there were no significant differences between all treatments and the control. Therefore MENNO Florades is comparable to reference products.
Furthermore the sorting of yield tubers resulted in an equal uniform distribution of size comparing the yield of the seeding tubers treated with MENNO Florades with the control, whereas treatment with some of the reference products resulted in a shifting between the size fractions. Therefore a treatment with MENNO Florades shows comparable or even better results than the reference products.

In a further trial (MEN-07-46) a possible effect of a treatment of potato tubers with MENNO Florades on their taste and flavour were determined. This trial has also been used to evaluate possible phytotoxic effects on emergence and crop development of tuber samples planted in the field (refer to IIIA1 6.2.1.3). In order to record any effects of the treatments on the taste or flavour of the potatoes, boiled potatoes of the three treatments were tested in pairs (untreated/MF tasted together, untreated/Imazil tasted together and MF/Imazil tasted together). All comparisons were tested blindly and were given grades varying from 1 – 10 (1 = bad taste, 10 = excellent taste) for taste or flavour and if necessary an additional remark was made.
The treatment with MENNO Florades prior to storage did not cause a significant difference in taste or flavour of tubers after storage.

IIIA1 6.1.4.2 Effects on the processing procedure

The objective of the application of MENNO Florades is to improve the plant quality by improving hygienic standards. MENNO Florades is not intended to be used for direct treatment of plants or plant products. Therefore no effects on the processing procedure are examined so far.

IIIA1 6.1.4.3 Effects on the yield of treated plants and plant products

Although plants or plant products are not directly treated, the use as fungicide and bacteriocide within a future extension of the intended use may contain the treatment of potato tubers. In this context effect of a treatment with MENNO Florades on the field emergence after planting and the yield was examined.

IIIA1 6.1.4.3.1 Effects on the field emergence of treated tubers

In 6 trials possible effects on the field emergence of treated potato tubers was determined. On different location in Germany and the Netherlands commercially grown varieties were tested for their field emergence after treatment with different concentration of MENNO Florades and storage before planting in the fields.
Depending on the location of the trial and the application rate the field emergence from potato tubers effects from a direct MENNO Florades treatment vary. The percentage of emerged sprouts is between 81.5 to 95.1 % after MENNO Florades treatment and between 91.3 to 97 % after treatment with the reference products. In the trials 07-57 and 07-63 the field emergence in the control and after MENNO Florades showed comparable results. In the trials 07-46 and 07-56 the emergence after MENNO Florades treatment is even higher compared to the control. In trial 07-62 the field emergence was affected in one trial side, whereas in the other location only a slight negative effect after a MENNO Florades treatment was observed. In trial 07-64 in all locations the field emergence is lower after MENNO Florades treatment of the tubers. However, the same effect was observed after treatment with the reference product, which has – in contrast to MENNO Florades – authorization for the direct treatment of tubers.

A summary of quality observations is presented in table 6.1.4- 2.

Table 6.1.4- 2: Effect of tuber treatments before storage on the field emergence after planting

Trial ID	Location	Variety	Year	Field emergence [%]											
					Water		MENNO Florades						Reference products		
				Control	600 ml/t	750 ml/t	800 mL/ha	1600 mL/ha*	200 mL/t, ULV	400 mL/t, ULV	400 mL/t, two component nozzle	500 ml/t	Monceren liquid	Imazil	MENNO ter forte
MEN-07-46	Dijkveld-Stol	Lady Christl	2003/2004	93	--	--	--	--	--	--	--	91	--	98	--
	Leyten			95	--	--	--	--	--	--	--	98	--	98	--
	Naaktgeboren			90	--	--	--	--	--	--	--	91	--	95	--
	PPO			95	--	--	--	--	--	--	--	97	--	97	--
	Dijkveld-Stol		2004/2005	91	--	--	--	--	--	--	--	97	--	95	--
	Dekkers			87	--	--	--	--	--	--	--	96	--	97	--
	Koetsenruiter			93	--	--	--	--	--	--	--	96	--	97	--
	Leyten			90	--	--	--	--	--	--	--	95	--	99	--
MEN-07-56	not stated	Cilena	2002	83		90	--	--	95	92	--	--	--	--	--
	not stated	Cilena	2002	78	83	--	--	--	87	94	--	--	--	--	92
MEN-07-57	Dethlingen	Cilena	2003	97	--	--	--	--	95	91	95	--	--	--	--
MEN-07-62	Dürrenmungenau	Quarta	2002	97	--	--	70	--	--	--	--	--	86	--	--
	Eckendorf	Kuras	2002	99	--	--	93	--	--	--	--	--	96	--	--
MEN-07-63	Gersthofen	Agria	2003	100	--	--	--	98	--	--	--	--	100	--	--
	Dürrenmungenau	Marabel	2003	100	--	--	--	99	--	--	--	--	99	--	--
	Eckendorf	Fasan	2003	97	--	--	--	93	--	--	--	--	97	--	--
MEN-07-64	Wittislingen	Karlena	2005	98	--	--	--	89	--	--	--	--	93	--	--
	Dürrenmungenau	Laura	2005	97	--	--	--	82	--	--	--	--	74	--	--
	Eckendorf	Fasan	2005	98	--	--	--	71	--	--	--	--	85	--	--
Number of results				19	1	1	2	6	3	3	1	8	5	8	1
Mean				93.6	83.0	90.0	81.5	88.7	92.3	92.3	95.0	95.1	91.3	97.0	92.0

IIIA1 6.1.4.3.2 Effects on the yield of previously treated and stored tubers

In 4 trials possible effects of a treatment of potato tubers with MENNO Florades before storage and later planting to the yield were determined.
A summary of quality observations is presented in table 6.1.4- 3.

Table 6.1.4- 3: Summary: the effect of MENNO Florades treatments on on relative yield of potatoes

Trial ID	Location	Variety	Year	Control	Evaluation							
					Percentage of control [%]							
					MENNO Florades					Reference products		
				Yield [dt/ha]	800 mL/ha	1600 mL/ha*	200 mL/t, ULV	400 mL/t, ULV	400 mL/t, two compo-nent nozzle	Monceren liquid	Monceren Plus	Proradix
MEN-07-57	Dethlingen	Cilena	2003	543	--	--	98.5	89.5	93.5	--	--	--
MEN-07-62	Gersthofen	Agria	2002	634	97.0	101	--	--	--	103	104	97
	Dür-renmungenau	Quarta	2002	422	73.0	--	--	--	--	90	90	87
	Eckendorf	Kuras	2002	455	95.0	--	--	--	--	102	88	99
MEN-07-63	Gersthofen	Agria	2003	552	--	100.0	--	--	--	98	102	--
	Dür-renmungenau	Marabel	2003	456	--	100.0	--	--	--	93	99	--
	Eckendorf	Fasan	2003	570	--	99.0	--	--	--	101	105	--
MEN-07-64	Eckendorf	Fasan	2005	483	--	99.4	--	--	--	97.5	64.8	101.9
Number of results 8					3	5	1	1	1	7	7	4
Mean					88.3	99.9	98.5	89.5	93.5	97.8	93.3	96.2

* = based on the assumption that 2.8 tons of potato tubers are planted per hectar (Indication of the amount of seed and planting treatment means and maximum seed or seedlings per hectare, BVL: http://www.bvl.bund.de/DE/04_Pflanzenschutzmittel/03_Antragsteller/04_Zulassungsverfahren/03_Wirksamkeit_Anwendung/psm_wirksamk_anwend_aufw_saatgutbeh_basepage.html), the given concentration of 800 mL/ha is equivalent to an application rate of 286 mL/t potatoes (1600 mL/ha ≙ 571 mL/ha)

Tubers treated with MENNO Florades and planted after storage showed comparable yield of potatoes. Only in one location of trial 07-62 the yield was strongly affected by the treatment of the starting material (tubers used for planting) with MENNO Florades (application rate 800 mL/ha), whereas on two other locations the same application rate showed results comparable to the control. This sporadic effect was also observed (but less significant) for the reference products at the same location (Eckendorf). Additionally, a treatment with "Monceren Plus" caused reduced yield in the trials 07-64 and 07-62 (location Eckendorf), wheras in another locations even positive effects were observed.
It is concluded that these effects occurred in all products and thus were not significant for Menno-Florades.

Effects on yield and quality: Not relevant for the uses according to the GAP-table as no direct application to plants is intended.

IIIA1 6.2 Adverse effects

IIIA1 6.2.1 Phytotoxicity to host crop

In principle, phytotoxicity is not been expected, because there is no direct treatment of plants or plant products or soil foreseen. Additionally, no signs of phytotoxicity have been reported in floriculture during the years since introduction of MENNO Florades in 1998. No signs of phytotoxicity have been observed during efficacy tests against bacteria, fungi, viruses and viroids.

Nevertheless during some efficacy tests, the whole plants were sprayed to determine the effects of inadvertently contact. Furthermore phytotoxicity of MENNO Florades to vegetables, ornamentals and mushrooms was determined within phytotoxicity trials. In addition in supportive trials effects of a direct treatment of potato tubers on the sprout emergence were examined.

Results of the studies are summarised in tables 6.2- 3 to 6.2- 8.

Table 6.2- 1: Number of phytotoxicity trials

Country	Phytotoxicity trials				
	1996	**1997**	**1998**	**1999**	**total**
Denmark	--	--	--	1	**1**
Germany	1	1	2	--	**4**
Netherlands	--	--	--	--	--
total	**1**	**1**	**2**	**1**	**5**

Table 6.2- 2: Number of trials with phytotoxicity assessment (others then phytotoxicity trials)

Country	Phytotoxological assessment within efficacy trials (vegetables and ornamentals)								Other trials (in potatoes)				
	1995	**1996**	**1998**	**1999**	**2000**	**2001**	**2004**	**total**	**2002**	**2003**	**2004**	**2005**	**total**
Denmark	--	--	--	--	--	--	--	--	--	--	--	--	--
Germany	2	1	1	1	3	1	**1**	**10**	2	1	1	1	**5**
Netherlands	--	--	--	--	--	--	--	--	--	1	--	1	**2**
total	**2**	**1**	**1**	**1**	**3**	**1**	**1**	**10**	**2**	**2**	**1**	**2**	**7**

10 trials were carried out on vegetables and ornamentals and 7 trials in potatoes in Denmark, Germany and the Netherlands from 1995-2005 (please refer to tables 6.2- 5 to 6.2- 7) on a wide range of commercially grown varieties, which were also used to demonstrate efficacy of the formulation compared to registered reference products.

In the following summaries of the results of trials about phytotoxicity and efficacy trials with phytotoxological aspects are presented separately. In case of adverse effects details are presented in additional tables. Furthermore the trials dealing with potatoes are presented separately from the trials with vegetables.

IIIA1 6.2.1.1 Effects reported in phytotoxicity trials

In total 5 phytotoxicological trials were carried out on ornamentals in Denmark and Germany from 1996-1999 (please refer to table 6.2- 1). Detailed information about the phytotoxicity symptoms in trial 07-52 are presented in the additional table 6.2- 4.

Table 6.2- 3: Phytotoxicity on ornamentals reported in phytotoxicity tests

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
MEN-07-51 1998b	Orchids	Blossom tolerance (Directly onto the leaves)	1, 2 & 5 %	No damage (independent of the blossom stage)
MEN-07-52 1998c	Orchids (Phalaenopsis & Miltonia)	Tissue tolerance (shoot segment, shoot and root)	1, 2 & 5 % 10 %	"Very high tolerance" "Does not cause any damage" Necrotic development (refer to table 6.2- 4)
MEN-07-53 1999	*Viola cornuta*	Growing tables were treated and the plants were placed on the table	1 % 2 % 4 %	Not phytotoxic, "No phytotoxic symptoms were found on leaves, shoots or flowers. Also the roots were normal and healthy."
MEN-07-54 1997	*Erica gracilis*	Soaking of the standing area. Disinfection 3 days before planting	not stated	Not phytotoxic
MEN-07-58 1996	*Adiantum cuniatum* „Fritz Luthi"	Plants were put on treated fleece mats 2.5 – 3 hours after disinfection	1 %	Not phytotoxic (EWRS scale: 1)
	Begonia boweri „Tiger"			
	Ficus pumila			
	Hypoestes phyllostachya			
	Peperomia columbiana			
	Peperomia sp. "Pixi variegata"			
	Pilea cadiere			
	Pteris cretica „Mayi"			
	Rosa Hybrid „Typ Botz"			

Table 6.2- 4: Plant tolerance of shoots and shoots with roots out of *Phalaenopsis* and *Miltonia* tissue cultures to the disinfectant MENNO Florades (refer to study 07-52)

Exposure time	Menno Florades concentration for treating									
	Shoot					Shoot with root				
	0 %	1 %	2 %	5 %	10 %	0 %	1 %	2 %	5 %	10 %
10 sec	+	+	+	+	-	+	+	+	+	-
20 sec	+	+	+	+	-	+	+	+	+	-
10 min	+	+	+	+	-	+	+	+	+	-

+ = plant tolerant
- = not plant tolerant

IIIA1 6.2.1.2 Effects reported in efficacy tests

Within 10 efficacy trials in total phytotoxological assessment was done on vegetables and ornamentals in Germany from 1995-2004 (please refer to tables 6.2- 5 and 6.2- 6).

Table 6.2- 5: Phytotoxicity on vegetables reported in efficacy tests:

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
MEN-07-15 2000	*Lycopersicum esculentum*	Contaminated knives were used for cutting after disinfection	< 5 %	High tolerance "The disinfectant does not cause any damages on the plants upon direct

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
				contact"
MEN-07-21 2000	*Chenopodium quinoa*	Applied on plant	< 5 %	High tolerance
	Cucumis sativus	Applied on plant	< 5 %	High tolerance
	Datura stramonium	Applied on plant	< 5 %	High tolerance
	*Herbaceous plants (*not specified)	Applied on plant	up to 4 %	High tolerance
	Orchids (*Phalaenopsis & Miltonia*)	Directly onto the leaves Directly onto the blossoms	up to 10 % > 5 %	"No damage" "Tolerance"
	Orchids (*Phalaenopsis & Miltonia*)			
	Nicotiana benthamiana	Applied on plant	< 5 %	High tolerance
	Nicotiana clevelandii	Applied on plant	< 5 %	High tolerance
	Nicotiana tabacum	Applied on plant	< 5 %	High tolerance
MEN-07-49 2001	*Nicotiana tabacum*	Applied on plant	1 & 1.5 %	Not phytotoxic "No differences"

Table 6.2- 6: Phytotoxicity on ornamentals reported in efficacy tests:

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
MEN-07-04 1995	Pelargoniums	Dipped with their stalks into solution	1, 2, 4, 8%	Not phytotoxic "No differences to the water control"
	Pelargoniums	Pots made of pressed peat were pre-swollen with MENNO Florades	1 %	Not phytotoxic "Negative effects on the plants could not be perceived"
	Poinsettias	Dipped with their stalks into solution	1, 2, 4, 8%	Not phytotoxic "No differences to the water control"
	Poinsettias	Pots made of pressed peat were pre-swollen with MENNO Florades	1 %	Not phytotoxic "Negative effects on the plants could not be perceived"
MEN-07-06 1996	*Pelargonium* „Grand Prix"	Knives were used for cutting after disinfection	1.5 & 3 %	Not phytotoxic "No reactions of incompatibility after applying the test agent could be observed"
MEN-07-07 1995	*Spathiphyllum* sp.	Disinfection of contaminated standing areas and growing containers	1 %	Not phytotoxic "The test agent did not cause any sign of a plant damaging effect"
MEN-07-13 1998	*Phalaenopsis*	Directly onto the leaves	1, 2, 4, 5, 6, 8 & 10 %	Not phytotoxic "The disinfectant does not cause any damages on the leaf blades"
MEN-07-21 2000	*Impatiens*	Applied on plant	< 5 %	High tolerance
	Miltonia sp.	Applied on plant	10 %	Not phytotoxic
	Phalaenopsis	Watering of the sand-bed / nursery plants Directly onto the leaves	up to 5 % 10 %	Not phytotoxic
	Pelargonium zonale	Applied on plant	< 5 %	High tolerance

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
	Peperomia columbiana	Applied on plant	< 5 %	High tolerance
MEN-07-59 1999	*Begonia* sp.	Applied on plant	1 %	"Slight necrosis, leaf marginal; necrosises appeared in all treatments but with less often"
MEN-07-60 2004	*Pelargonium* „Grand Prix"	Applied on plant	1 % 2 & 3 %	"Rarely very small lesions at the leaf marginal" "More frequent and severe lesions at the leaf marginal, affecting the ornamental value significantly" "Flowers more or less damaged depending on the MENNO Florades concentration"
	Begonia "Netja Dark"	Applied on plant	 1 % 2 % 3 %	In general more sensitive compared to *Pelargonium* „Grand Prix" "Rarely very small lesions on the leaf marginal" "Symptoms similar to 3 % MENNO Florades but on a smaller scale" "Severe burns at the leaf marginal, occasional lesions at the lamina especionally at injuries" "Flowers more or less damaged depending on the MENNO Florades concentration"

IIIA1 6.2.1.3 Potato trials with phytotoxological assessment

In total 7 trials were carried out on vegetables (potatoes) in Germany and the Netherlands from 1995-2005 (please refer to table 6.2- 7). These trials were also used for preliminary range finding under IIIA1 6.1.1. Detailed information about the phytotoxicity symptoms in trials 07-62 and 07-64 are presented in the additional table 6.2- 8.

Table 6.2- 7: Phytotoxicity on potato reported in phytotoxicity tests:

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
MEN-07-11 2003	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	50 %	Not phytotoxic (No phytotoxic effects on the sprouts)
MEN-07-46 2005	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	50 %	Not phytotoxic (No significant negative effect on emergence and crop development)
MEN-07-56 2002	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	200 ml/t 400 ml/t*	Not phytotoxic (No significant negative effect on emergence and crop development)
MEN-07-57 2003	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	200 ml/t 400 ml/t*	Not phytotoxic (No significant negative effect on emergence)

Trial ID	Plant species	Experimental design	Tested concentration	Phytotoxicity
MEN-07-62 2003	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	800 ml/ha 1600 ml/ha*	Slightly phytotoxic (Reduced emergence of sprouts (refer to table 6.2- 7)
MEN-07-63 2003	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	1600 ml/ha*	Not phytotoxic (No significant negative effect on emergence)
MEN-07-64 2003	*Potato (Solanum tuberosum)*	Applied on tubers before storage and subsequent planting in the field.	1600 ml/ha*	Slightly phytotoxic (Reduced emergence of sprouts) (refer to table 6.2- 7)

* = application rate

Table 6.2- 8: Effect of tuber treatments with MENNO Florades on the later sprout emergence of potatoes)

	MEN-07-62		MEN-07-64		
Trial location	**Dürrenmungenau**	**Eckendorf**	**Wittislingen**	**Dürrenmungenau**	**Eckendorf**
Year	**2002**	**2002**	**2005**	**2005**	**2005**
Treatment	**Sprout emergence [%]**				
Control	97	99	98	97	98
MENNO Florades	70	93	89	82	71
Monceren liquid	86	96	95	74	85
Monceren Plus	97	98	97	66	1
Proradix WG	87	94	-	-	87

Conclusions

A general statement concerning phytotoxicity cannot be given because of the different raising conditions and the innumerable species of ornamental plants.

Unintentional splashes on adjacent plants in greenhouses during treatment may lead to temporary spots of discolouration on leaves and blossoms, but this will only happen accidentally. Phytotoxicity was only reported rarely on some species. So the shoots of orchidees were affected after treatment with 10 % MENNO Florades. However, this concentration is 2.5-fold higher than the highest intended concentration. In any case it is recommended to perform a tolerance test with some nursery plants before treating the whole culture, especially in the case of produce ready for sale. Pelargonium and Elatiorbegonia showed lesions at the leaf marginal already after application of lower MENNO Florades concentrations, whereby in general Elatiorbegonia was more sensitive compared to Pelargonium. Anyhow the intended uses do not content the direct application on plants. In case of disinfection procedures close to existing cultures, a narrower spray spurt should be used.

MENNO Florades is not intended to be used for direct treatment of plants or plant products. Nevertheless when treating surfaces, on which plants in pots are placed (especially ebb-flood benches, fleece mats) and culture vessels, intake via the roots is possible. Because of the low concentration of benzoic acid, no phytotoxic effect will occur. However, if freshly potted plants with dry root balls are dipped directly into puddles of MENNO Florades, or placed on fleece mats saturated with MENNO Florades, alcohol-burning at the roots was thought to be possible, but no effects were observed during testing.

If knives are treated before graft, the intake via the cut surface is possible. However, the low concentration of benzoic acid will not cause any phytotoxic effects. Tests with treated knives have not shown any phytotoxic effects at the treated plants.

If benzoic acid is incorporated into plants, normal metabolism and excretion in plants will take place, because benzoic acid is a natural component of plants.

However, in the instructions for use it is recommended to perform a tolerance test with some nursery plants before treating surfaces, equipment or tools which may have direct contact to plants. This precaution is sufficient to detect possible phytotoxic effects in advance, when applying MENNO Florades to new plant species.

Regarding the treatment of potato tubers general statement concerning phytotoxicity cannot be given. In most of the trials no negative effects were observed. In some trial sites the treatment of potato tubers affected the subsequent emergence of the sprouts at high concentrations (50 % product in solution with water), which are not relevant for the current use on boxes, containers and storage rooms (refer to table 6.2- 8). Additionally the storage rooms will be well dried before storage of the tubers. For a future extension of the intended uses (including the direct treatment of potato tubers), these results have to be reconsidered.

Phytotoxicity: No direct application of MENNO Florades to plants is intended. Therefore direct contact to the disinfectant is limited to residues directly after disinfection or unintended contact with plants when disinfection is carried out close to them. The use of the disinfectant according to the GAP (no direct application to the plants) is unlikely to cause phytotoxicity while direct application to the plants may cause undesired effects. As a measure of precaution it is recommended in the instructions for use to perform a small scale tolerance test with plants which might have contact to disinfected material.

IIIA1 6.2.2 Adverse effects on health of host animals

No EC data requirement

IIIA1 6.2.3 Adverse effects on site of application

The wear resistance against contact with MENNO Florades off exemplary surfaces was tested in two trials (KIIIA-6.2.3/01 was part of an efficacy test). Surfaces typically used in floriculture, horticulture and agriculture for standing areas, machinery and equipment were treated several times in different concentrations with MENNO Florades.

Dossier No.	**KIIIA-6.2.3/01**
Report:	Röhmeyer (2003) Testing of tin surfaces for resistence to the plant protection product MENNO Florades (German title: Prüfung der Oberflächen auf Beständigkeit gegen das Pflanzenschutzmittel MENNO Florades)
Previous evaluation:	Submitted for the purpose of renewal
Owner:	MENNO CHEMIE-VERTRIEB GmbH.
Report No.	**MEN-07-55** (3837PR30330)
Test facility:	Institute for Material Control of TÜV Nord e.V.
Report date:	October 14, 2003
Dates of work	October 2003
Test substance:	MENNO Florades 9% SL
Test medium:	Aqueous solution of MENNO Florades: 1%, 2 % and 3 %
Test objects:	3 tins varnished with: Dipping varnish

Spraying varnish
Powder varnish

1 Galvanized tin
1 V_2A-tin

Guideline:
GLP: No
Published: No

I MATERIALS AND METHODS

Sections of tin (ca. 10 x 10 mm) were wetted through dipping inti the test medium. Then they were stored with the varnished side facing upwards and additionally applied with one drop of the test medium. After 24 h, the test object was washed off with water and visually rated after drying. This procedure was repeated 5 times.

II RESULTS AND DISCUSSION

Table 6.2- 9: Results of testing of varnished surfaces for resistance to the plant protection product MENNO Florades

Surface	Concentration of the test medium	Findings				
		1x wetted	2x wetted	3x wetted	4x wetted	5x wetted
Tin with Dipping varnish	1 %	n.f.	n.f.	n.f.	n.f.	n.f.
	2 %	n.f.	n.f.	n.f.	n.f.	n.f.
	3 %	n.f.	n.f.	n.f.	n.f.	n.f.
Tin with Spraying varnish	1 %	n.f.	n.f.	n.f.	n.f.	n.f.
	2 %	n.f.	n.f.	n.f.	n.f.	n.f.
	3 %	n.f.	n.f.	n.f.	n.f.	g.r.
Tin with Powder varnish	1 %	n.f.	n.f.	n.f.	n.f.	n.f.
	2 %	n.f.	n.f.	n.f.	n.f.	n.f.
	3 %	n.f.	n.f.	n.f.	n.f.	n.f.
Galvanized tin	1 %	n.f.	g.r.	g.r.	g.r.	g.r.
	2 %	n.f.	g.r.	g.r.	g.r.	g.r.
	3 %	n.f.	g.r.	g.r.	g.r.	g.r.
V_2A-tin	1 %	n.f.	n.f.	n.f.	n.f.	n.f.
	2 %	n.f.	n.f.	n.f.	stained surface	stained surface
	3 %	n.f.	n.f.	n.f.	stained surface	stained surface

n.f.: no findings
g.r.: glossreduction

Röhmeyer (2003)

III RESULTS (summarizied by reviewer)

In this study treatments of artificially infested greenhouse surface materials did not result in corrosion neither of varnished tin nor on galvanized tin or V_2A-tin. The observed effects were gloss reduction in case of galvanized tin (if treated more than once) and a stained surface in case of V_2A-tin (if treated more than three times). The varnished tins were not affected at all.

Dossier No.	**KIIIA-6.2.3/02**
Report:	Harding, M.W. and Howard, R.J. (2003) Evaluation of MENNO-Floradestm for Efficacy Against Selected Bacterial, Fungal and Viral Pathogens of Greenhouse Vegetable Crops.
Previous evalua-	Submitted for the purpose of renewal

tion:	
Owner:	MENNO CHEMIE-VERTRIEB GmbH.
Report No.	**MEN-07-47** (3837PR30330)
Test facility:	Institute for Material Control of TÜV Nord e.V.
Report date:	October 14, 2003
Dates of work	October 2003
Test substance:	MENNO Florades 9% SL
Test medium:	Aqueous solution of MENNO Florades: 1%, 2 % and 3 %
Test objects:	3 tins varnished with: Dipping varnish Spraying varnish Powder varnish
	1 Galvanized tin
	1 V_2A-tin
Guideline:	
GLP:	No
Published:	No

Executive summary

Nine chemical disinfectants, including MENNO-Florades™ (MENNO Chemie-Vertrieb GMBH, Norderstedt, Germany), with the active ingredient benzoic acid, were tested for efficacy against seven pathogens (four fungi, one bacterium, two viruses) of greenhouse vegetables. Measurements were taken from treatments of artificially infested greenhouse surface materials and, where possible, from axenic in vitro trials. Results of in vitro trials showed that MENNO-Florades™ caused complete mortality of bacteria and fungi, while results against viruses varied.

Disinfestation of surfaces revealed that surface characteristics including porosity and hydrophobicity could negatively impact the activity of chemical disinfectants. Additionally, rapid drying and increased organic load can reduce disinfectant efficacy. Greenhouse surfaces included metals (copper, aluminium, steel, stainless steel, galvanized tin), polymers (polyethylene, polycarbonate, polyvinylchloride), glass, wood, rubber, and concrete.

Disinfectants were also rated for corrosive or damaging effects on greenhouse surfaces, and human and environmental health and safety hazards. Corrosion analyses showed that copper, steel and galvanized metal were sensitive to corrosion by exposure to an undiluted concentration of the product.

The negative control (sterile, double-distilled water) had no detectable negative effect on the growth or survival of phytopathogenic microbes and did no damage, or insignificant damage to surfaces.

Information on environmental toxicity and personal health and safety hazards available from labels and MSDSs indicated that MENNO-FLORADES™ was one of the least hazardous chemical disinfectants.

I MATERIALS AND METHODS

Structural damage from chemical disinfectants was measured gravimetrically and visually. For quantitative assessment of surface corrosion, small (approximately 1-cm x 4-cm) surface corrosion coupons were cut from raw material and weighed to the nearest tenth or hundredth of a milligram. An acute exposure was simulated using a set of corrosion coupons that was immersed 24-hours in one of each of the chemical disinfectants. One set underwent an ‘acute exposure’ (to an undiluted sample of the disinfectant stock formulation), and one set was exposed ‘chronically’ to a sample at the manufacturer’s recommended dilution. The chronic exposure involved 4 repeated cycles of immersion followed by air-drying over a period of 3 days. The coupons from both experiments were rinsed with distilled water three times, air-dried and

weighed. An additional chronic exposure was simulated using a larger (approximately 6-inch x 6-inch) sample of each surface to which a drop of each disinfectant, at the manufacturer's recommended dilution, was added and allowed to dry. This was repeated on the same spot of each surface three times. After 4 treatments, the surfaces were examined for etching, corrosion, pitting, scoring, hardening etc. using a binocular dissecting light microscope.

II RESULTS

The potential for corrosion or damage due to chemical exposure was estimated by exposing small coupons of common greenhouse materials (plastics, metals, wood and concrete) to each disinfectant. The first experiment involved a chronic exposure of each disinfectant at the manufacturer's recommended dilution. No significant differences were detected gravimetrically or visually in the chronic exposure trial. A second experiment was done to simulate an acute exposure to a concentrated dose of each disinfectant. The results for each disinfectant against each material are summarized in Table 6.2- 10. Visual microscopic characterization of surface damages was qualitatively recorded for each disinfectant against each surface material. Polyethylene, polycarbonate, glass, PVC, wood and concrete were not noticeably damaged by any chemical tested. Rubber coupons were left hardened and/or cracked by some chemicals and metals showed an array of reactions (refer to Table 6.2- 11).

Table 6.2- 10: Corrosive or damaging effects of chemical disinfectants on surface coupons.

	% Weight Change of Surface Coupon										
	PE	**PC**	**GL**	**RU**	**PVC**	**CO**	**WO**	**AL**	**ST**	**SS**	**GA**
MENNO Florades	**0**	**0.05**	**0**	**0.69**	**0.04**	**0.18***	**-3.02**	**0.05**	**0.43***	**0**	**8.57***
Water	± 0.6	± 0.11	± 0.01	± 0.32	± 0	± 0.01	± 3.10	± 0.01	± 0.02	± 0	± 0.02

PE = polyethylene; PC = polycarbonate; GL = glass; RU = rubber; PVC = polyvinylchloride; CO = copper; WO = wood; AL = aluminum; ST = steel; SS = stainless steel; GA = galvanized tin.
* Indicates a statistically significant change in weight.

Table 6.2- 11: Qualitative visual characterization of damage to surface coupons after exposure to chemical disinfectants.

	Rubber	**Copper**	**Aluminium**	**Steel**	**Stainless**	**Galvanized**
MENNO Florades	-	du	co, du	co	-	co
Water	-	-	-	-	-	-

'-' indicates no detectable damage
For rubber: ha = hardening; cr = cracking;
For metals: rx = reactive, co = corrosive; di = discoloration; du = dulling of finish; de = deterioration; pi = pitting; in = major incompatibility; et = etching; pe = peeling; fl = flaking; bl = blistering

Harding, M.W. and Howard, R.J. (2003)

Overall Conclusions

The intended uses contain application on surfaces of storage rooms, buildings, machine halls and greenhouses, furthermore equipment (containers and cultivation vessels, tables) and tools (e.g. knifes, secateurs).
Since containers and cultivation vessels for ornamentals and vegetables are normally made of plastic (e.g. Polyethylene), no negative effect is expected.

The corrosion of copper concerns e.g. tables in greenhouses. Since the corrosion effect is not intense (minor change of weight, refer to table 6.2- 11), the effect is negligible. The pure light metal aluminum has a naturally dull silver-gray appearance because of a rapidly forming thin oxide layer. This impenetrable oxide layer (about 0.05 µm) makes pure aluminum highly resistant to further corrosion.
Since knifes, secateurs etc. are made of stainless steel, acute exposure to MENNO Florades will not affect these tools.
Storage rooms are normally made of concrete and wood which are not affected by MENNO Florades.
Since MENNO Florades (or the contained acids respectively) causes corrosion to conventional steel, surfaces with obstructed steel should be controlled regularly after application.

Copper, steel and galvanized metal were sensitive to corrosion after four treatments with the undiluted concentrate, which can easily be explained by the activity of the acids in MENNO Florades. However, since the intended use does not contain the application of the undiluted concentrate and the materials will not have contact to the solution for 24 hours, the conditions within the studies can be rated as a worst case scenario.

IIIA1 6.2.4 Adverse effects on beneficial organisms (other than bees)

No signs of impact on beneficial and other non-target organisms have been reported since the introduction of MENNO Florades as disinfectant in 1998. Beneficial organisms in this special case are defined as microorganisms intentionally applied by the user (e.g. *Bacillus thuringensis*-preparations against pests). Use of such beneficial organisms and disinfectants at the same time obviously is not good agricultural practice.

Risk assessment for bees and other non-target arthropods:
No risk is identified, because no direct treatment of plants or plant products or on soil is itended and the application only takes place in protected rooms (storage rooms, machine halls, greenhouses).

Risk assessment for soil organisms:
With respect to the common construction of facilities in horticulture and agriculture, the PECsoil value calculated from a rate reaching soil of 28800 g Benzoic acid/ ha does not play a role for eco-toxicological risk assessment and was not considered further.

- This worst case calculation assumes that the total amount of application solution (max. 320 L of a 4% solution per hectare) will enter the soil below the greenhouse. Since most glasshouses, machine halls and other protected areas in professional agriculture and horticulture are built with a solid foundation (e.g. concrete), this scenario is very unlikely.
- Taken into account greenhouses on bare soil, but constructed as permanent buildings, the soil below is usually very compact and shows a lack of organic matter (substrate for soil organisms). Thus the site is unsuitable for soil dwellers (soil macro-organisms), but not for soil micro-organisms.

Soil macro-organisms: The PECsoil value calculated from a rate reaching soil of 28.8 g Benzoic acid/ ha plays a role for organisms that are located in the soil around the greenhouse. In this case, the emission from greenhouse was considered with 0.1%, as suggested for the risk assessment in surface water. Thus, only the maximal/ initial PECsoil of 0.038 mg Benzoic acid / kg soil was taken into account for the risk towards soil non-target earthworms and macro-organisms.

Soil micro-organism: The full rate was considered for risk assessment, because it is assumed that soil microorganisms occur even under unfavourable conditions in compacted bare soil in greenhouses.
For soil microcorganisms the full rate was considered to be relevant, because

Table 6.2- 12: Summary of PEC_{soil} calculations for the active substance Benzoic acid

Benzoic acid	*0% crop interception* PEC initial [mg a.i./kg soil at 5 cm]
Rate reaching soil: 28800 g Benzoic acid /ha (Assuming that the total amount of application solution (max. 320 L of a 4% solution per hectare) will enter the soil below the closed structure – scenario is considered unlikely and was not addressed for birds & mammals, aquatic species, non-target arthropods and soil-dwelling macro-organisms, but for soil microorganisms.	38.4
Rate reaching soil: 28.8 g Benzoic acid / ha (0.1% deposition rate from the worst case application of 28800 g a.i./ha in closed structures)	0.038

Table 6.2- 13: Toxicity/exposure ratios for earthworms and other soil non-target macro-organisms.

Test substance	Species	Test type	Endpoint [mg a.s./kg soil d.w.]	Initial/ maximal PEC_{soil} [mg a.i./kg soil dw]	TER	TER risk assessment trigger
Benzoic acid	*Eisenia fetida*	Acute	*Not required / No effect observed*			
		Long term	NOEC = 384	(Rate reaching soil: 28.8 g Benzoic acid /ha) 0.038	10105	5
Benzoic acid	*Folsomia candida*	Acute	*Not required / No effect observed*			
		Long term	NOEC = 143	(Rate reaching soil: 28.8 g Benzoic acid /ha) 0.038	3763	5

Table 6.2- 14: Effects on soil micro-organisms

Test	Duration	Concentration	Results	Reference
Nitrogen transformation	28 days	192 mg Benzoic acid/ kg soil DW corresponding to 5 times the maximum application rate	No effects > 25%	New data on the active substance (KIIA-8.10.1/01)

The trigger values laid down in Annex VI were not exceeded, indicating that MENNO Florades and the active substance Benzoic acid does not pose a risk to soil macro- and microorganisms.

Study summaries:

Dossier No.:	**KIIIA1-6.2.4/01**
Report:	Winkelmann, G. (2013): Benzoic acid - Earthworm (*Eisenia fetida*), Effects on Reproduction according to OECD-Test Guideline 222, Version dated 23 Nov 2004
Previous evaluation:	Submitted for the purpose of renewal
Owner:	MENNO Chemie-Vertrieb GmbH
Report date:	22. November 2013
Published:	No

Test facility: Dr.U.Noack-Laboratorien, Käthe-Paulus-Str.1, D-31157 Sarstedt
Report No.: Project-No. 130611DH / Study-No. RBR15572
Dates of work: August 21th to October 16th, 2013
Test substance: Benzoic acid
Guideline: OECD Guideline222 (Verison dated 23 Nov 2004)
Deviations: Food was given on day 0 instead on day 1 due to good experience with this procedure. The soil moisture slightly deviated by more than 10 % from the initial value in the test item concentrations 48 to 384 mg Benzoic acid/kg soil dry weight. These deviations are considered to have no impact on the quality and integrity of the study.
GLP: Yes, certified by Staatliches Gewerbeaufsichtsamt Hildesheim, Germany

Executive Summary

Effects of Benzoic acid (Batch no. BCBK2035V) on mortality, biomass and the reproductive potential of the earthworm species Eisenia fetida (Annelida, Lumbricidae) were determined according to the Guideline OECD 222 (2004) from August 21th to October 16th, 2013 at DR.U.NOACK-LABORATORIEN in 31157 Sarstedt, Germany. The study was conducted under static conditions over 8 weeks with the test item concentrations 24 - 48 - 96 - 192 - 384 mg Benzoic acid/kg soil dry weight, which were mixed into artificial soil containing 5 % peat and a control using untreated artificial soil. 80 test organisms were inserted into 8 control replicates and 40 test organisms were divided into 4 replicates for each treatment (10 earthworms per replicate). They had an individual body weight between 0.33 and 0.60 g at experimental starting.

After 28 days of exposure in soil, no evident earthworm mortalities (< 10%) as well as no pathological symptoms or changes in the behaviour of adult earthworms were observed in all treatments. In all test item concentrations the biomass increases of the adult earthworms were not statistically significantly different compared to the control after the first 28 days. After further four weeks the reproduction rate (average number of juveniles produced) was 58 in the control and ranged between 61 and 83 in the test item concentrations. Compared to the control, the reproduction rates were not statistically significantly different in the test item concentrations 24 to 384 mg Benzoic acid/kg soil dry weight.

Overall, the NOEC of the test item concerning mortality, biomass and reproduction of earthworms was determined to be 384 mg Benzoic acid/kg soil dry weight and the LOEC was determined to be > 384 mg Benzoic acid/kg soil dry weight. EC50-values for biomass and reproduction were not calculated since no reduction of body weight and reproduction occurred at the application rates.
All validity criteria recommended by the test guideline were fulfilled.

Table 6.2- 15: Mortality after 28 days, behaviour changes and effects on reproduction of adult earthworms in [%] after 28 days of exposure

Application rate [mg Benzoic acid/kg soil dry weight]	Mean Mortality (%)	Behavioural changes besides mortality	Mean body weight change of earthworms (%)	Reproduction rate Mean number of juveniles after 8 weeks
Control	0	None	21.7 ± 6.29	58 ± 14.5
24	2.5	None	21.4 ± 3.14	61 ± 8.81
48	2.5	None	25.9 ± 9.73	78 ± 30.6
96	5.0	None	26.5 ± 5.92	61 ± 14.0
192	0	None	31.0 ± 6.57	72 ± 24.6

384	0	None	23.1 ± 6.66	83 ± 30.5

I MATERIALS AND METHODS

A. MATERIALS

1.	**Test Material:**	Benzoic acid
	Description:	Crystalline, white
	Lot/batch #:	BCBK2035V
	Concentration/Purity:	99.8 %
	Stability of test compound:	Expiry date: 2016-07-01
	Storage conditions_	Room temperature, protected from light, in original container
2.	**Vehicle and/or control:**	Quartz sand
	Application of the test item:	The test item was treated with a mortar, the respective test item amounts were weighed out for the test item concentrations and blended thoroughly with quartz sand (10 g per replicate). Afterwards the test item - quartz sand mixture was given to the artificial soil. Demineralised water was added to adjust the humidity of the artificial soil to a moisture of 40 - 60 % of the maximum water holding capacity.
3.	**Test animals (Species)**	*Eisenia fetida* (Annelida, Lumbricidae)
	Age:	2-12 months
	Mean weight:	0.33 to 0.60 g
	Source:	Own breeding (20 ± 2 °C, fed with dried litter)
	Synchronisation	Earthworms of homogeneous age and body weight were used in the definitive test. Synchronisation of the population was achieved by placing adult earthworms into breeding boxes and removing the adults after 4 weeks. Offspring from the remaining cocoons reached the adult age after 2 months at the earliest.
	Acclimation period:	2 days
	Animals per test concentration:	10 earthworms per test item concentration
	Artificial soil components:	Artificial soil with a reduced peat content was used to simulate worst-case conditions. The soil consisted of the following components: 5 % peat, air dried and finely ground 20 % Kaolin, kaolinite content > 30 % 74 % Air dried quartz sand (sand with > 50 % particle size of 0.05 - 0.2 mm) 0.30 % Calcium carbonate (CaCO3) to achieve a pH of 6.0 ±0.5
	Number of replicates:	8 replicates per control and 4 replicates per test item concentration
	Test container:	Round plastic boxes (PE, food grade) with an inner diameter of 15.0 cm corresponding to a bottom surface area of 177 cm^2 and a height of 14.0 cm contained about 600 g soil dry weight. Transparent and perforated lids enabled sufficient gas exchange as well as light input and prevented the test substrate from drying.
	Feeding:	The earthworms were fed with cattle manure during the first 4 weeks. At test start and at day 28 the food was carefully mixed into the soil, on the other days the food was placed on the soil surface. The cattle manure was delivered by LEHR- UND FORSCHUNGSGUT RUTHE, Schäferberg 1, 31157 Sarstedt, Germany

Day	Amount of food [g] Cattle manure
0	5
7, 14, 21, 28	5
35, 42, 49	–

Untreated variant: Artificial soil moistened with demineralised water without test or reference item was used as control medium.

Reference Item: Carbendazim

4. **Environmental conditions**

Temperature: 20 ± 2 °C

pH: 6.0 ± 0.5

Humidity (Moisture content of the soil): 40 - 60 % of the maximum water holding capacity.

Moistening: Throughout the test the replicates were weighed weekly. Evaporated water was added to maintain the soil moisture which should not deviate by more than 10 % of the initial value at the end of the test.

Day	Amount of additional demineralised water [mL]
0	–
7, 14, 21, 28	5
35, 42, 49	-

Water capacity: Assessed during experiment (Result: WHC_{max} of artificial soil = 40.6 g/100 g DW]

Photoperiod 16 h light (400 - 800 lx)

B. STUDY DESIGN AND METHODS:

1. **In-life dates** 2013-08-21– 2013-10-16
2. **Experimental design** At experimental starting earthworms were washed in dechlorinated tap water, dabbed dry gently on paper towels. The homogeneity of the population was checked by weighing the earthworms. After confirmation of homogeneity, groups of 10 earthworms (chosen by a randomized procedure) were weighed and introduced to each test vessel. Feeding was carried out with 5 g cattle manure during the first 4 weeks as described above. At starting and experimental completion, pH-value and moisture content of the test medium were determined in every treatment and control from pooled samples of all replicates. These measurements were done according to the Standard Operation Procedures of the test facility.Water content of the test container was checked weekly by weighing. The weight loss was replenished with the appropriate amount of demineralised water. The body weight of the adult earthworms was individually determined at day 0 and at day 28 for each test container. After the first four weeks adult earthworms were removed. Mortality and morphological changes of the adult earthworms were recorded for each

test container. After further four weeks, the number of offspring hatched from the cocoons was counted for each test container.

Test concentrations: 24 - 48 - 96 - 192 - 384 mg Benzoic acid/kg soil dry weight

Chemical analysis: No chemical analysis; Environmental parameters were assessed with standard methods.

Test duration: 8 weeks

3. **Observations:**

Environmental parameters:
pH-value, maximum water holding capacity, moisture content

Adult earthworms:
body weight
Mortality and morphological changes:

A) no obvious pathological symptoms
B) no reaction to touching
C) no negative phototactical reaction
D) spontaneous segmentation and separation
E) spasmodic winding
F) yellow excretion from the oral aperture
G) ulcer and skin bleedings
H) dead earthworms

Offspring:
Number of offspring hatched

4. Statistics: The arithmetic mean and NOEC were determined. EC values of adult mortality were not calculated since no evident earthworm mortality occurred. One Way Analysis of Variance (ANOVA) was carried out for the determination of statistically significant differences compared to the control. A Normality Test and an Equal Variance Test were conducted prior to running the ANOVA. P-values for both Normality and Equal Variance Test are 0.05. The α-value for ANOVA test (acceptable probability of incorrectly concluding that there is a difference) is $\alpha = 0.05$. EC values for biomass and reproduction were not calculated since no reduction of body weight and reproduction occurred at the application rates.

II RESULTS AND DISCUSSION

Under the conditions of this study, Benzoic acid did not induce evident mortality, pathological symptoms or changes of the behaviour of adult earthworms after 28 days of exposure at all tested concentrations. The biomass increase of the adult earthworms throughout the first 28 days was not statistically significantly different compared to the control at all test item concentrations. After eight weeks of exposure the earthworm reproduction did not statistically significantly differ from the control in all the test item concentrations.

Table 6.2- 16: Summary of All Observed Effects on Adult Earthworms in the Tested Application Rates

Effects		Benzoic acid				
[mg Benzoic acid/kg soil dry weight]	Control	24	48	96	192	384
Mean mortality of adult earthworms [%] after 28 d	0	2.5	2.5	5.0	0	0
Behavioural changes of adult earthworms after 28 d	None	None	None	None	None	None
Mean body weight change of adult earthworms after 28 d	21.7 ± 6.29	21.4 ± 3.14	25.9 ± 9.73	26.5 ± 5.92	31.0 ± 6.57	23.1 ± 6.66

Summary of effects compared to the control	-	No significant effects	No significant effects	No significant effects	No significant effects	No significant effects

Table 6.2- 17: Summary of All Observed Effects on Reproduction in the Tested Application Rates

Effects		Benzoic acid				
[mg Benzoic acid/kg soil dry weight]	Control	24	48	96	192	384
Mean number of juveniles	58 ± 14.5	61 ± 8.81	78 ± 30.6	61 ± 14.0	72 ± 24.6	83 ± 30.5
Percentage compared to the control	-	105	134	105	124	143
Summary of effects compared to the control	-	No significant effects	No significant effects	No significant effects	No significant effects	No significant effects

Table 6.2- 18 NOEC, LOEC and EC50-values

Endpoint	[mg Benzoic acid/kg soil dry weight]
$NOEC_{mortality,\ biomass,\ reproduction}$	384
$LOEC_{mortality,\ biomass,\ reproduction}$	> 384
EC_{50} of mortality, biomass, reproduction (95 % Confidence Interval)	Not determined

All validity criteria were fulfilled:

- The adult mortality in the control group did not exceed 10 % after the first four weeks of the definitive test.
- The average number of juveniles in the control group was higher than 30 per replicate.
- The coefficient of variation calculated for the reproduction of the control was lower than 30 % at the end of the test.

III CONCLUSIONS

The No Observed Effect Concentration (NOEC) for Benzoic acid summarizing the endpoints mortality, body weight and reproduction of *Eisenia fetida* after 8 weeks of exposure in artificial soil was determined to be 384 mg Benzoic acid/kg soil dry weight.
The LOEC was determined to be > 384 mg Benzoic acid/kg soil dry weight. The EC*50* for reproduction and biomass was not determined since no reduction of body weight and reproduction occurred.

(Winkelmann, G., 2013)

Dossier No.:	**KIIIA1-6.2.4/02**
Report:	Bruhnke, C. (2013): Benzoic acid - Collembolan (*Folsomia candida*) Reproduction Test in Soil, acc. to OECD 232 (2009), Verison dated 2009 *Calculation of NOEC- and LOEC-values and statistical analysis of mortality (stepdown trend test) was done by Becker, E.-M. (DHD-Consulting GmbH)*
Previous evaluation:	Submitted for the purpose of renewal
Owner:	MENNO Chemie-Vertrieb GmbH
Report date:	02.12.2013
Published:	No
Test facility:	Dr.U. Noack-Laboratorien, Käthe-Paulus-Str.1, D-31157 Sarstedt
Report No.:	Project-No. 130611DH / Study-No. ICR15572
Dates of work:	September 19th to October 25h, 2013
Test substance:	Benzoic acid
Guideline:	OECD 232 (September 2009) Guideline for Testing Chemicals: Collembolan Reproduction Test in Soil
Deviations:	From the guideline: Due to organizational reasons, the soil moisture and addition of food was on day 13 instead on day 14 of the study. Due to technical reasons during the adaption phase, the temperature decreased to 17.5°C (total time < 18°C = about 3 hours). Due to technical reasons during the exposure phase, the temperature decreased to 16°C (total time < 18°C = about 65 hours). At the test item rate 143 mg/kg DW the soil moisture was slightly outside of the demanded range of 40 - 60% of WHC. At test start the soil moisture was 62.7% and decreased to 61.0% until day 13. At test end the soil moisture was 58.4%. From the study plan: Test conditions (temperature and soil moisture): See deviations described under "DEVIATIONS FROM THE GUIDELINE". The juveniles were separated from the remaining eggs after two days instead of three days. The results of the control support that these deviations have no impact on quality and integrity of the study as the control replicates were subject to the same test conditions (excluding to the test item rate 143 mg/kg DW, with slightly increased soil moisture (application method 1)) and fulfil the validity criteria. It is assumed that the slightly increased soil moisture at the test item rate 143 mg/kg DW had no impact on quality and integrity of the study.
GLP:	Yes, certified by Staatliches Gewerbeaufsichtsamt Hildesheim, Germany

Executive Summary

The effects of Benzoic acid on the reproduction of *Folsomia candida* in artificial soil were determined in a laboratory study (OECD 232). The aim of the test was to determine the effects of the test item on mortality and reproduction of *Folsomia candida* in artificial soil (5 % peat) by cutaneous and alimentary uptake.

The pre-tests revealed that the solubility of the test item was only reached when buffer solutions were used. Since it is not clarified whether buffer solutions can be used according to the guideline it was decided to incorporate the test item as test item - quartz sand mixture once at experimental starting into the artificial soil with the test item rates of 4.20 - 7.56 - 13.6 - 24.5 - 44.1 - 79.4 - 143 - 257 mg/kg DW (factor 1.8). For this, the test item was blended with quartz sand (1% of the entire soil (DW) amount per rate) and the test item - quartz sand mixture was mixed into the soil. As control artificial soil with an additional amount of 1% quartz sand but without test item was used.

Furthermore, for comparability purposes the test item rates 13.6 - 44.1 - 143 - 257 mg/kg DW including a control were tested in parallel using buffer solution of pH 7 (NaOH 0.1 mol/L + KH_2PO_4 0.1 mol/L) as solvent for the test item. At experimental starting a respective aliquot of the test item buffer stock solution was mixed into the soil for each application rate. As control artificial soil with buffer solution without test item was used.
After application, ten juvenile *Folsomia candida* (10 days old) were placed onto the artificial soil of each replicate. 8 replicates for the controls and 4 replicates for the test item rates were tested. During exposure, springtails were fed with granulated organic dry yeast. After 28 days, adult mortality and reproduction were assessed.

Table 6.2- 19: Mortality after 28 days, behaviour modifications or pathological symptoms and effects on reproduction of *Folsomia candida* in different application types

Application rate [mg Benzoic acid/kg soil dry weight]	Test Item mixed with Quartz Sand			Test Item dissolved in Buffer pH 7		
	Mean Mortality (%)	Behaviour modifications or pathological symptoms	Reproduction rate Mean number of juveniles after 8 weeks	Mean Mortality (%)	Behavioural changes besides mortality	Reproduction rate Mean number of juveniles after 8 weeks
Control	15.0 ± 10.7	None	641 ± 94.6	6.25 ± 10.6	None	704 ± 33.9
4.20	15.0 ± 12.9	None	639 ± 91.3	--	None	--
7.56	22.5 ± 20.6	None	632 ± 141	--	None	--
13.6	2.50 ± 5.00	None	614 ± 76.7	17.5 ± 17.1	None	722 ± 48.0
24.5	0.00 ± 0.00	None	660 ± 28.0	--	None	--
44.1	35.0 ± 17.3	None	724 ± 28.6	7.50 ± 15.0	None	668 ± 63.8
79.4	7.50 ± 9.57	None	647 ± 46.0	--	None	--
143	5.00 ± 10.0	None	721 ± 47.2	5.00 ± 5.77	None	677 ± 59.7
257	40.0 ± 33.7	None	696 ± 24.1	40.0 ± 8.16	None	594 ± 53.8

Reproduction:

Application method 1: Test item mixed with quartz sand

EC_{10}-, EC_{20}- and EC_{50}-value could not be calculated and were determined to be > 257 mg/kg DW as mean inhibition of reproduction at all test item rates was ≤ 4.21%. No statistically significant inhibition of reproduction could be observed up to a test item rate of 257 mg/kg DW (ANOVA, p = 0.05).

Application method 2: Test item dissolved in buffer pH 7

EC_{20}- and EC_{50}-value could not be calculated as mean inhibition of reproduction at all test item rates was ≤ 15.6%. They were determined to be > 257 mg/kg DW, each. EC_{10}-value was determined to be 200 mg/kg (CI[21]: 132 - > 257 mg/kg). A statistically significant inhibition of reproduction could be observed at the test item rate 257 mg/kg DW (ANOVA, DUNNETT'S METHOD, p = 0.05).

Mortality:

The contract laboratory was not able to fix an endpoint for mortality because of missing statistical programs, therefore the reviewer/monitor (Eva-Maria Becker, DHD-Consulting GmbH, Hildesheim) used the raw data to for evaluation. Following results have been achieved:

Comparison of the two test methods: **No statistical differences between both application methods were observed**.

[21] Confidence Interval

Mortality: Taken into account mortality data from the application method with quartz sand, no trend is observable for the tested concentration range and no significant differences were observed between the tested concentrations and the control. From the application method with quartz sand it can be assumed that there is no effect on mortality of collembola at the tested concentration level.

Taken into account mortality data from the application method with buffer solution, the NOEC has to be set to 143 mg/kg DW.

Considering reproduction data and the mortality, a significant effect was observed at a concentration level of 257 mg/kg bw**. Hence, the NOEC is determined 143 mg Benzoic acid/kg bw.**

I MATERIALS AND METHODS

A. MATERIALS

1. **Test Material:** Benzoic acid
   Description: Crystalline, white
   Lot/batch #: BCBK2035V
   Concentration/Purity: 99.8 %
   Stability of test compound: Expiry date: 2016-07-01
   Storage conditions_ Room temperature, protected from light, in original container
2. **Vehicle and/or control:** quartz sand / buffer solution
   Application of the test item:

Method 1: Application of the test item with quartz sand
The test item was treated with a mortar, the respective test item amounts were weighed out for each test item rate and blended thoroughly with quartz sand (1% of the entire soil (DW) amount per rate). Afterwards, the test item - quartz sand mixture was mixed carefully into the soil with a mixer to ensure a homogenous distribution of the test item for at least 3 minutes. 30 g soil wet weight was filled without compression into each replicate vessel.
Control: 53 mL demineralised water was added to 427 g soil (374 g DW) adjusted to 30% maximum water holding capacity (WHCmax) to obtain a soil moisture of about 60% WHCmax and additionally, 3.7 g quartz sand (DW) was added.
Test item: For each test item rate, a respective amount of test item was mixed with 2.8 g quartz sand and the mixture was added to 360 g soil (281 g DW) adjusted to about 60% WHCmax to obtain the required test item rate.

Method 2: Application of the test item with buffer solution
The test item was treated with a mortar. For a stock solution of 200 mL 368.9 mg test item was weighed out and dissolved in buffer solution of pH-value 7 (NaOH 0.1 mol/L + KH_2PO_4 0.1 mol/L) by treating the mixture with ultra sound at 30°C for 30 minutes. The preparation of the test item rates was conducted as follows:
Control: 53 mL buffer solution of pH value 7 was added to 427 g soil (374 g DW) adjusted to 30% WHCmax to obtain a soil moisture of about 60% WHCmax.
Test item: A total amount of 39 mL (aliquot of the stock solu-

		tion plus buffer solution of pH 7 (excluding the highest test item rate) was added to 321 g soil (281 g DW) adjusted to about 30% WHCmax to obtain the required test item rate and a soil moisture of about 60% WHCmax. After application, the test medium was thoroughly mixed for at least 3 minutes with a blender to ensure a homogenous distribution of the test item and the water. 30 g soil wet weight was filled without compression into each replicate vessel.
3.	**Test animals (Species)**	*Folsomia candida* WILLEM (Mandibulata, Antennata, Apterigota, Collembola)
	Age:	10 days
	Mean weight:	Not stated, springtails of homogeneous age and size were used
	Source:	Own breeding
	Culture and Conditions (during Breeding)	Culture: Folsomia candida was bred at the test facility in covered polyethylene flasks (h = ca. 3 - 16 cm, Ø = ca. 5 - 6 cm) on artificial soil containing 89% w/w calcium sulphate dihydrate (DW) and 11% w/w powdered activated charcoal (DW). Conditions during breeding: Temperature of approximately 20°C and darkness
	Acclimation period:	The springtails were adapted 1 day to test conditions
	Animals per test concentration:	10 juvenile springtails per replicate
	Number of replicates:	8 replicates per control and 4 replicates per test item concentration
	Artificial soil components:	Artificial soil was used as test medium. It consisted of the following components: 5% peat, air dried and finely ground (2 mm) 20% kaolin clay, kaolinite content > 30% 74% air dried quartz sand (sand with > 50% particles size of 0.05 to 0.20 mm) 0.1 - 1% calcium carbonate ($CaCO_3$) to adjust the pH value to 6.0 ± 0.5
	Test container:	Glass beakers with a volume of 100 mL (inner Ø = 4.3 cm) were used and covered with PARAFILM.
	Feeding:	Springtails were fed with 5 mg granulated dry yeast per replicate at test start and with 9 mg granulated dry yeast per replicate after 13 days.
	Untreated variant:	Refer to application of the test item
	Reference Item:	Boric Acid (50 - 100 - 200 - 400 mg/kg DW)
4.	**Environmental conditions**	
	Temperature:	nominal: 20 ± 2 °C / actual: 17.5 – 20 °C
	pH:	6.0
	Humidity (Moisture content of the soil):	nominal: 40-60 % of WHCmax / actual: 54.4 - 62.7% of WHCmax
	Moistening:	Soil moisture was determined at experimental starting (day 0), Day 13 and experimental end (day 28). After 13 days the soil moisture was determined in 2 replicates per treatment. It was not necessary to re-moisten the replicates as the soil moisture deviated < 2% from the initial value.
	Water capacity:	WHCmax: 46.9 g H_2O/100 g DW

Photoperiod	12 h light (400 – 800 lx)

B. STUDY DESIGN AND METHODS:

1.	**In-life dates**	2013-09-19– 2013-10-25
2.	**Experimental design**	At experimental starting 10 juvenile springtails per replicate were inserted into each replicate with an exhauster by a randomized procedure. Care was taken not to damage the springtails. The maximum water holding capacity and the soil moisture (acc. to ISO11268-2) were determined prior to experimental starting. At the start and at the end of the test, pH-value (acc. to DIN19684) and moisture content of the test medium were determined in additional replicates for each treatment. On day 13, moisture content of the test medium was determined for each test item rate and control out of additional replicates. It was not necessary to re-moisten the test medium. After 28 days of exposure, the test medium was poured into bellaplast boxes (9.5x9.5x6 cm) and watered with dechlorinated tap water. After gentle stirring of the suspension with a spatula, black ink was added to the water to improve the contrast. Due to their water repellent cuticle, springtails drifted to the water surface. Adults were counted twice on day 28. The highest counted number of adults was taken into evaluation. On day 28, pictures of the water surface were prepared using appropriate equipment. On the digital picture juvenile springtails were counted at PC. Missing adult springtails were counted as dead due to rapid degradation.
	Range Finding Test (non-GLP)	A preliminary NON-GLP range finding test was performed with 4 test item rates (1, 10, 100 and 1000 mg/kg DW).
	Test concentrations:	Method 1: Application of the test item with quartz sand 4.20 - 7.56 - 13.6 - 24.5 - 44.1 - 79.4 - 143 - 257 mg/kg DW (factor 1.8) Method 2: Application of the test item with buffer solution 13.6 - 44.1 - 143 - 257 mg/kg DW (factor 1.8)
	Chemical analysis:	No chemical analysis; Environmental parameters were assessed with standard methods.
	Test duration:	28 d
3.	**Observations:**	Environmental parameters: pH-value, maximum water holding capacity, moisture content Springtails: Number of alive adult springtails and juveniles
4.	**Statistics:**	NOEC/LOEC: Mortality Statistical evaluation of the mortality data was not conducted. According to OECD 54 a step-down trend test is indicated. This software was not available at DR.U.NOACK-LABORATORIEN. NOEC/LOEC: Reproduction Significant differences compared to the control were determined using ANOVA (application method 1) and ANOVA DUNNETT'S METHOD (application method 2). A Normality Test

and an Equal Variance Test were conducted prior to ANOVA.

Calculation of LC/ECx-values is explained in results part below.

II RESULTS AND DISCUSSION

Table 6.2- 20: Mortality and Reproduction of Folsomia candida (Test Item mixed with Quartz Sand)

Test item	Benzoic acid				
Test system	*Folsomia candida*				
Exposure	Artificial soil				
	Mortality after 28 Days [%] ± SD	Corrected Mortality after 28 Days [%]	Reproduction [offspring] ± SD	CV [%]	Reduction of Reproduction [%]
Control	15.0 ± 10.7	-	641 ± 94.6	14.8	-
Benzoic acid [mg/kg DW]					
4.20	15.0 ± 12.9	0.00	639 ± 91.3	14.3	0.31
7.56	22.5 ± 20.6	8.82	632 ± 141	22.3	1.40
13.6	2.50 ± 5.00	-14.7	614 ± 76.7	12.5	4.21
24.5	0.00 ± 0.00	-17.6	660 ± 28.0	4.24	-2.96
44.1	35.0 ± 17.3	23.5	724 ± 28.6	3.95	-12.9
79.4	7.50 ± 9.57	-8.82	647 ± 46.0	7.11	-0.94
143	5.00 ± 10.0	-11.8	721 ± 47.2	6.55	-12.5
257	40.0 ± 33.7	29.4	696 ± 24.1	3.46	-8.58

Mortality		Reproduction	
LC_{50}-value (CI 95%)	> 257 mg benzoic acid/kg DW (-)	EC_{50}-value (CI 95%)	> 257 mg benzoic acid/kg DW (-)
LC_{20}-value (CI 95%)	1)	EC_{20}-value (CI 95%)	> 257 mg benzoic acid/kg DW (-)
LC_{10}-value (CI 95%)	1)	EC_{10}-value (CI 95%)	> 257 mg benzoic acid/kg DW (-)
NOEC	2)	NOEC	257 mg benzoic acid/kg DW
LOEC	2)	LOEC	> 257 mg benzoic acid/kg DW

SD = Standard Deviation
CV = Coefficient of Variation
DW = Dry Weight
CI = Confidence Interval
1) = Not calculable due to the fluctuating results within the concentration range.
2) = Not determined as suitable statistic software according to OECD 54 was not available.
-) = Not calculable

Table 6.2- 21: Mortality and Reproduction of Folsomia candida (Test Item dissolved in Buffer pH 7)

Test item	Benzoic acid				
Test system	*Folsomia candida*				
Exposure	Artificial soil				
	Mortality after 28 Days [%] ± SD	Corrected Mortality after 28 Days [%]	Reproduction [offspring] ± SD	CV [%]	Reduction of Reproduction [%]
Control	6.25 ± 10.6	-	704 ± 33.9	4.82	-
Benzoic acid [mg/kg DW]					
13.6	17.5 ± 17.1	12.0	722 ± 48.0	6.65	-2.56
44.1	7.50 ± 15.0	1.33	668 ± 63.8	9.55	5.11
143	5.00 ± 5.77	-1.33	677 ± 59.7	8.82	3.84
257	40.0 ± 8.16	36.0	594 ± 53.8*	9.06	15.6

Mortality		Reproduction	
LC_{50}-value (CI 95%)	> 257 mg benzoic acid/kg DW (-)	EC_{50}-value	> 257 mg benzoic acid/kg DW (-)
LC_{20}-value (CI 95%)	225 mg benzoic acid/kg DW (-)	EC_{20}-value (CI 95%)	> 257 mg benzoic acid/kg DW (-)
LC_{10}-value (CI 95%)	186 mg benzoic acid/kg DW (-)	EC_{10}-value (CI 95%)	200 mg benzoic acid/kg DW (132 - > 257 mg/kg DW)

NOEC	**1)**	**NOER**	**143 mg benzoic acid/kg DW**
LOEC	1)	LOER	257 mg benzoic acid/kg DW

SD = Standard Deviation
CV = Coefficient of Variation
DW = Dry Weight
CI = Confidence Interval
*) = Statistically significant inhibition of reproduction compared to the control (ANOVA, DUNNETT'S METHOD, p = 0.05).
1) = Not determined as suitable software according to OECD 54 was not available.
-) = Not calcuable

Validity criteria:

- The mean adult mortality in the control group should be ≤ 20%. In this study, it was 15.0% (quartz sand control) and 6.25% (buffer control).
- The reproduction rate in the control should be ≥ 100 per replicate. In this study, the mean reproduction rate in the control was 641 juveniles (test item mixed with quartz sand) and 704 juveniles (test item dissolved in buffer pH 7).
- The coefficient of variation of the reproduction rate should be ≤ 30% in control group. In this study, the coefficient of variation was 14.8% (test item mixed with quartz sand) and 4.82% (test item dissolved in buffer pH 7).

Since the validity criteria were fulfilled, the study is considered to be valid.

III CONCLUSIONS

Mortality:

A statistical analysis of the mortality data was not conducted. According to OECD 54 it is indicated to use stepdown trend tests (e.g. Jonkheere, Cochran-Armitage) for the statistical evaluation. This software was not available at the DR.U.NOACK-LABORATORIEN.

Application method 1: Test item mixed with quartz sand

The LC_{50}-value could not be calculated as mean corrected mortality of all test item rates was ≤ 29.4% and was determined to be > 257 mg/kg DW. The LC_{10}- and LC_{20}-value could not be calculated due to the fluctuating mortality results within the concentration range.

Application method 2: Test item dissolved in buffer pH 7

The LC_{50}-value could not be calculated as mean corrected mortality of all test item rates was ≤ 36.0%. The LC_{10}- was determined to be 186 mg/kg DW and the LC_{20}-value 225 mg/kg DW.

Reproduction:

Application method 1: Test item mixed with quartz sand

EC_{10}-, EC_{20}- and EC_{50}-value could not be calculated and were determined to be > 257 mg/kg DW as mean inhibition of reproduction at all test item rates was ≤ 4.21%. No statistically significant inhibition of reproduction could be observed up to a test item rate of 257 mg/kg DW (ANOVA, p = 0.05).

Application method 2: Test item dissolved in buffer pH 7

EC_{20}- and EC_{50}-value could not be calculated as mean inhibition of reproduction at all test item rates was ≤ 15.6%. They were determined to be > 257 mg/kg DW, each. EC_{10}-value was determined to be 200 mg/kg (Confidence interval: 132 - > 257 mg/kg). A statistically significant inhibition of reproduction could be observed at the test item rate 257 mg/kg DW (ANOVA, DUNNETT'S METHOD, p = 0.05).

(Bruhnke, C., 2013)

Reviewers comment (Eva-Maria Becker, DHD-Consulting GmbH, Hildesheim, Germany):

1. Intention 1

Because of uncertainties with respect to solubility of Benzoic acid, the abovementioned study was performed with two application types.

A) Test item mixed with quartz for application
B) Test item dissolved in buffer pH 7 for application

The first intention is to test whether there is a significant difference between the both application methods.

2. Intention 2

In the original study, a statistical evaluation of mortality data was not performed, because the software was not available at the laboratory. The second intension is to perform proper statistical analysis of mortality data according to OECD 54.

3. Methods(according to OECD 54)

- Intention 1: To test whether there is a significant difference between the both application methods, a **paired t-test** was performed for the 5 concentrations tested with both methods.
- Intention 2: Taken into account the decision tree for quantal data as presented in OECD 54, a **step-down trend test** has to be performed for mortality data. OECD 54 indicates that a **Shapiro-Wilk test** (Shapiro and Wilk 1965) of normality should be performed, if parametric tests are being considered for use. This test was performed on both mortality data sets prior to statistical analysis. Furthermore OECD 54 indicates, if the data are not normally distributed, then either a normalising transformation should be sought or a non-parametric analysis should be done. Since mortality data were not normally distributed, two **non-parameteric tests** were used: The step-down trend test after **Jonckheere-Terpstra** as recommended in OECD 54 and the closely related **Kruskal-Wallis** test to investigate whether there are significant differences between treatments and control.

  Statistical analysis was performed with R software[22].

4. Results

Intention 1: The paired t-test indicates that there are no statistical differences between both application methods.

Intention 2:

- Result of Jonckheere-Terpstra for mortality data obtained with the application method in quartz sand: No trend among data.
- Result of Kruskal-Wallis for mortality data obtained with the application method in quartz sand: No significant difference between treatments and control.
- Result of Jonckheere-Terpstra for mortality data obtained with the application method in buffer solution: After removing the highest concentration (257 mg/kg) the trend was not significant. Hence, NOEC = 143 mg/kg DW
- Result of Kruskal-Wallis mortality data obtained with the application method in buffer solution: Significant difference between the highest concentration and the control treatment. Hence, NOEC = 143 mg/kg DW

[22] http://www.r-project.org/

5. Conclusions

Intention 1: **No statistical differences between both application methods were observed**.

Intention 2: Taken into account mortality data from the application method with quartz sand, no trend is observable for the tested concentration range and no significant differences were observed between the tested concentrations and the control. From the application method with quartz sand it can be assumed that there is no effect on mortality of collembola at the tested concentration level.

Taken into account mortality data from the application method with buffer solution, the NOEC has to be set to 143 mg/kg DW.

Considering reproduction data (see summary), a significant effect was observed at a concentration level of 257 mg/kg bw**. Hence, the NOEC is determined 143 mg Benzoic acid/kg bw.**

(Becker, E.-M., 2013)

Dossier No.:	**KIIA-6.04/03**
Report:	Winkelmann, G. (2013): Benzoic acid - Soil Micro-Organisms: Nitrogen Transformation Test according to OECD-Test Guideline 216, Version dated 21 January 2000
Previous evaluation:	Submitted for the purpose of renewal
Owner:	MENNO Chemie-Vertrieb GmbH
Report date:	Draft 12/2013
Published:	No
Test facility:	Dr.U. Noack-Laboratorien, Käthe-Paulus-Str.1, D-31157 Sarstedt
Report No.:	Project-No. 130611DH / Study-No. TBN15572
Dates of work:	August 23th to October 9th, 2013
Test substance:	Benzoic acid
Guideline:	OECD Guideline 216 (Verison dated 21 Jan 2000)
Deviations:	The soil was stored at 6 ± 2 °C instead of 4 ± 2 °C due to organisational reasons. This deviation is considered to have no impact on the quality and integrity of the study.
GLP:	Yes, certified by Staatliches Gewerbeaufsichtsamt Hildesheim, Germany

Executive Summary

The effects of Benzoic acid (batch no. BCBK2035V) on the metabolic activity of soil micro-organisms were determined according to OECD Guideline 216 (2000) at DR.U.NOACK-LABORATORIEN, 31157 Sarstedt, Germany, from 2013-09-10 to 2013-10-09, with a definitive exposure phase from 2013-09-10 to 2013-10-08.

The test item was incorporated at a maximum concentration of 38.4 mg/kg soil dry weight corresponding to a maximum application rate of 28.8 kg Benzoic acid/ha and 192 mg/kg soil dry weight corresponding to 5 times maximum application rate of 144 kg Benzoic acid/ha. The conversion from kg/ha to mg/kg is

based on a soil density of 1.5 g/cm³ and a soil layer of 5 cm. Untreated silty sand soil was tested as control.
The effects of the test item on the metabolic activity of the nitrogen-N formation rate (nitrate) were measured on the day of treatment (day 0) and subsequently after 7, 14 and 28 days.
Benzoic acid did not affect the microbial nitrate formation rate (differences < 25 %) after 7, 14 and 28 days when applied at 38.4 mg/kg dw soil and 192 mg/kg dw soil. The obtained results indicate that Benzoic acid is not expected to cause any long term detrimental effects on nitrogen turnover in soil under normal conditions.

Table 6.2- 22: Inhibition of Inorganic-N-Formation Rates

Nitrate-N Formation Rate			
Test item concentration [mg/kg soil dry weight]	Inhibition [%] compared to control		
	7 d	14 d	28 d
38.4	18	14	1
192	18	7	7

positive values = inhibition negative values = increase

I. MATERIALS AND METHODS

A. MATERIALS

1. **Test Material:** Benzoic acid
   Description: Crystalline, white
   Lot/batch: BCBK2035V
   Concentration/Purity: 99.8 %
   Stability of test compound: Expiry date: 2016-07-01

2. **Vehicle and/or control:** quartz sand

3. **Test animals (Species):** Soil microflora
   Replicates: 3 replicates per test concentration and control
   Test vessel: Plastic boxes (volume 1.0 L, food grade) with perforated tops to enable gas exchange.
   Test soil: A field fresh, silty sand soil was used in the study. The soil met the requirements of the test guideline.
   Nominal soil parameters were:
   Sand content 50 - 75 %
   pH value 5.5 - 7.5
   Organic carbon content 0.5 - 1.5 %
   Microbial biomass (expressed as carbon content) at least 1 % of the total soil organic carbon.
   The amount of total inorganic nitrogen was determined at test start.
   Origin: LUFA SPEYER, Obere Langgasse 40, 67346 Speyer, Germany,
   Site and Coordinates: Offenbach, Rheinland-Pfalz, Germany, R-439683; H-5449554, Sampling date: 2013-08-13
   Soil history between 2009 - 2013: no culture, no fertilisation, no crop

protection

Soil parameter:

Parameter			**LUFA-soil 2.3** Batch-No. F2.33313
sampling depth*			ca. 20 cm
pH value*			6.0 ± 0.9
Dry weight (DW) before application [g/100 g soil]			86.4
Maximum water holding capacity* [g/100 g DW]			36.2 ± 2.0
Particle size distribution acc. to DIN*			
Sand:			
2.0 - 0.63	mm	[%]	2.1 ± 0.6
0.63 - 0.2	mm	[%]	30.1 ± 0.1
0.2 - 0.063	mm	[%]	25.4 ± 2.0
Silt:			
0.063 - 0.02	mm	[%]	20.2 ± 2.1
0.02 - 0.006	mm	[%]	11.4 ± 1.0
0.006 - 0.002	mm	[%]	5.1 ± 0.1
Clay:			
< 0.002	mm	[%]	5.9 ± 2.5
Organic carbon content [%][1)]			0.72
Microbial biomass [%] of total organic carbon[2)]			3.0
Nitrate-N [mg NO_3-N/kg DW]			8.43
Ammonium-N [mg NH_4-N/kg DW]			< LOQ
Total inorganic Nitrogen [mg/kg DW][2)]			8.43
Cation exchange capacity [meq/100 g]*			6.9 ± 1.0
Soil texture*			silty sand#

*) data provided by LUFA SPEYER

#) acc. to German DIN classification

1) data determined by INSTITUT KOLDINGEN GMBH

2) determined on day 0

LOQ = Limit of quantification

Soil storage:

The soil was stored for 4 days in the dark at 6 ± 2 °C. Subsequently, the soil was pre-incubated at room temperature (13 - 22 °C) for 21 days before experimental starting.

Handling of the soil:

<u>At LUFA Speyer:</u>

The soil was manually cleared of large objects and then sieved to a particle size of up to 2 mm. The maximal water holding capacity and the pH value were determined.

<u>At test facility:</u>

The soil moisture content was determined. The soil was adjusted to about 45 % of its maximal water holding capacity with demineralised water. Drying out of the soil was prevented by moistening with demineralised water as necessary.

Amendment of organic carbon content:

The soil was checked for a detectable microbial biomass (result in terms of percentage of total organic carbon).The soil amounts were amended with powdered lucerne-green-grass-meal (0.5 % of soil dry weight).

Untreated variant: Untreated soil with 1 % quartz sand was tested under the same conditions as the test replicates.

Reference standard: Cyanoguanidine (Lot: STBB2559V (Sigma Aldrich) / Expiry date: 2013-04-0), CAS: 461-58-5, Purity: 100.4%

50 mg Cyanoguanidine /kg soil dry weight
100 mg Cyanoguanidine /kg soil dry weight

4. Environmental conditions

Temperature: 20 ± 2 °C

pH: Day 0: 6.01 - 6.31
Day 28: 6.02 - 6.04

Soil moisture: At experimental starting the soil was adjusted to approximately 50 % of its maximal water holding capacity. All replicates were checked once per week for water losses by evaporation (recommended maximum 5 %, actual 0.6 - 1.2 %). Compensation with demineralised water was done. Replicates were weighed for this procedure.
Day 0: 48.8 – 48-9 % Maximal Water Holding Capacity

Photoperiod: Dark 28: 50.2 – 51.0 % Maximal Water Holding Capacity

B. STUDY DESIGN AND METHODS

1. In-life dates: 2013-09-10– 2013-10-09

2. Experimental design: For the determination of the metabolic activity of soil microorganisms the nitrogen mineralisation and nitrification for a period of 28 days were tested at two dose rates. The test item was treated with a mortar, the respective test item amounts were weighted out for the test item concentration and blended thoroughly with quartz sand (1% of the entire soil amount per concentration). Afterwards the test item - quartz sand mixture was mixed carefully into the soil with a mixer to ensure a homogeneous distribution of the test item in the soil. Afterwards, the soil was distributed to the replicates (450 g soil dry weight per replicate). The application was carried out once at experimental starting.
Incubation was performed in bulk and sub-samples were taken for measurements / observations.

Test concentrations:

- 38.4 mg Benzoic acid/kg soil dry weight (corresponding to1 time maximum application rate: 28.8 kg Benzoic acid/ha
- 192 mg Benzoic acid/kg soil dry weight (corresponding to 5 times maximum application rate: 144 kg Benzoic acid/ha)

Test duration: 28 days

3. Observations: Measurements of inorganic nitrate were carried out after 0, 7, 14 and 28 days (method given below). The pH values (pH Meter, Multi 340i, WTW) and water contents were determined on day 0 and 28. The room temperature was measured and recorded continuously by a data logger (Testo). Nitrate was extracted from soil with a mineral salt solution (2 M potassium chloride solution). For the elimination of coloured organic matter in the extraction solution a cleaning step with solid phase extraction (SPE) cartridges (HF Bond Elut C18 (3 mL, 500 mg), AGILENT) was carried out. Thereafter, photometric determination took place at a wave length of 588 nm for nitrate (Spectrophotometer Nanocoloruv/vis, MACHEREY & NAGEL). Potassium nitrate (> 99 %) was used as standard.

4. Calculations: Inorganic N concentration in extract [mg inorganic N/L], Nitrate-N concentration in soil [mg NO_3-N / kg soil dry weight] and Nitrate-N formation rate [mg NO_3-N * (kg soil dry weight * d)$^{-1}$] were calculated. Furthermore, the deviation of the control was calculated for each sampling date.
Calculations were carried out using Excel, MICROSOFT CORPORATION and SigmaPlot, SPSS INC.
No further statistics were applied.

5. Validity criteria Variation between control replicates should be less than ± 15 % at all measurement dates

II. RESULTS AND DISCUSSION

Changes of nitrate-N contents and nitrate-N formation rates (expressed as percent of the control group values) are listed in the following table:

Table 6.2- 23: Inhibition of Inorganic-N Formation Rates - Nitrate-N Content

Test item concentration	Inhibition [%] compared to control			
[mg/kg soil dry weight]	0 d	7 d	14 d	28 d
38.4	-14	5	6	-3
192	-17	4	0	2

positive values = inhibition negative values = increase

Table 6.2- 24: Inhibition of Inorganic-N Formation Rates - Nitrate-N Formation Rate

Nitrate-N Formation Rate			
Test item concentration	Inhibition [%] compared to control		
[mg/kg soil dry weight]	7 d	14 d	28 d
38.4	18	14	1
192	18	7	7

positive values = inhibition negative values = increase

Reference test Item

Cyanoguanidine is tested once per year as toxic reference with 50 and 100 mg/kg soil dry weight.

Table 6.2- 25: Inhibition of Nitrate-N Formation Rates of the Reference Item Test

	Inhibition [%] compared to Control		
Day	7	14	28
Cyanoguanidine 50 mg/kg soil dry weight	51*	52*	14
Cyanoguanidine 100 mg/kg soil dry weight	70*	85*	100*

*) difference to control ≥ 25 %

Validity criteria of the study

Variation between control replicates was < 15 % at days 0, 7, 14 and 28 for the determination of inorganic nitrogen (nitrate-N content). In detail, variations of nitrate-N contents between control replicates were 10 % at day 0, 3 % at day 7, 6 % at day 14 and 2 % at day 28.

III. CONCLUSIONS

The effects of the test item on the metabolic activity of the nitrogen-N formation rate (nitrate) were measured on the day of treatment (day 0) and subsequently after 7, 14 and 28 days.
Benzoic acid did not affect the microbial nitrate formation rate (differences < 25 %) after 7, 14 and 28 days when applied at 38.4 mg/kg soil dry weight and 192 mg/kg soil dry weight.
The obtained results indicate that Benzoic acid is not expected to cause any long term detrimental effects on nitrogen turnover in soil under normal conditions.

Winkelmann, G. (Draft 12-2013)

The product MENNO Florades (benzoic acid: 90 g/L) has been developed for use as disinfectant of surfaces and tools in protected areas only (e.g. flower pots, trays, transport containers, benches and storage rooms, cultivation rooms, greenhouses). Applications as fungicide, bactericide and viricide are indoor post-harvest spraying, foaming, dipping, watering and flooding. Due to the applications specified in the registration procedure (area of application: ornamentals, vegetable crops, mushroom production, potatoes and tobacco; timing of application: post-harvest; application: spraying, foaming, dipping, watering, flooding), populations of relevant arthropods will not be affected.

IIIA1 6.2.5 Adverse effects on parts of plant used for propagating purposes

No signs of undesired impact on plants or plant products to be used for propagation have been reported since the introduction of MENNO Florades as disinfectant in 1998. MENNO Florades is used in companies and nurseries specialized in plant propagation to prevent infections.

IIIA1 6.2.6 Impact on succeeding crops

No impact is expected because of the short degradation time in soil. Half-life rate in soil is less than one day.

IIIA1 6.2.7 Impact on other plants including adjacent crops

The formulation is not an herbicide and not used in the field. Therefore no trials have been conducted.

Unintentional splashes on adjacent plants in greenhouses during treatment may lead to temporary spots of discolouration on leaves and blossoms, but this will only happen accidentally. Phytotoxicity was only reported rarely on some species. So the shoots of orchidees were affected after treatment with 10 %

MENNO Florades. However, this concentration is 2.5-fold higher than the highest intended concentration.

IIIA1 6.2.8 Possible development of resistance or cross-resistance

No resistance against plant pathogenic bacteria, fungi, viruses and viroids has been reported since the introduction of MENNO Florades as a plant protection product in 1998.

MENNO Florades is not intended to be used for direct treatment of plants or plant products and it is used in companies and nurseries to prevent infections. Therefore the regular agronomical factors reducing or increasing the risk of a development of resistance are not applicable here. The disinfection procedure itself represents as a protective step to prevent the spread of diseases and the resulting use of plant protection products which involves the possible development of resistance of pathogens.

IIIA1 6.2.8.1 Mode of action

Since its discovery, the active ingredient benzoic acid has been registered and used in various fields of applications. So far, the bactericidal and fungicidal properties of benzoic acid are commonly known. No resistance or cross-resistance to benzoic acid is known for plant pathogens so far.

Benzoic acid is described as non-specific inhibitor. The undissociated acid is effective against microbes. Benzoic acid (uncharged, undissociated and freely permeable across the plasma membrane) enters the cell (by passive diffusion) and dissociates. Charged anions and protons are released and accumulate inside the cell. Benzoic acid molecules diffuse into the cell according to the pH gradient (until equilibrium is reached). The accumulation of charged ions results in membrane disruption, inhibition of essential metabolic reactions (uncoupling of both substrate transport and oxidative phosphorylation from the electron transport system, inhibition of citric acid cycle) homeostatic stress, and accumulation of toxic anions. In yeast the induction of stress response by benzoic acid is reported, resulting in the reduction of available energy pools.

Benzoic acid is known to inhibit the cell multiplication of bacteria. Furthermore, the inhibition of enzymes as well as microbial growth is described.
Benzoic acid is a hydroxyl radical scavenger and is reported to inhibit immune responses based on reactive oxygen intermediates.

IIIA1 6.2.8.2 Mechanisms of resistance

No resistance or cross-resistance to benzoic acid is known for plant pathogens.

However, many microorganisms in water and soil are known to metabolize benzoic acid. This causes a very rapid biodegradation in natural environments. In *Saccharomyces cerevisiae* an efflux system for benzoic acid was observed (energy-dependant fast export of benzoic acid). For *Escherichia coli* and some bacteria a resistance was observed by acid tolerance response (adaption to damage). Overview resistance mechanisms of microbes against weak acids such as benzoic acid:

- Degradation by enzymes (i.e. *Pseudomonas aeruginosa)*
- Adaption to low pH (acid tolerance) (i.e *Salmonella typhimurium)*

- H^+ -pumping P-type membrane ATPase (yeast)
- Efflux system for benzoic acid (*Saccharomyces cerevisiae)*
- Reduction of the passage into the cell (yeast)

IIIA1 6.2.8.3 Evidence of resistance

No resistance to benzoic acid is known for plant pathogens.

IIIA1 6.2.8.4 Cross-resistance

No cross-resistance to benzoic acid is known for plant pathogens.

IIIA1 6.2.8.5 Sensitivity data

Since there is no resistance or cross-resistance to benzoic acid is known for plant pathogens, no sensitivity data are available.

IIIA1 6.2.8.6 Use pattern

MENNO Florades is intended for disinfection of standing areas, surfaces, equipment, and container in storage and processing rooms. Additionally it is used for the preventive treatment of small tools i.e. knives and other cutting tools:

Floriculture: standing areas, surfaces, ebb/flood benches, culture vessels, knives, gardening equipment; only onto hard surfaces, **no direct application on plants**

Agriculture (potatoes and tobacco): standing areas, surfaces (storage rooms, culture rooms, machine shops, machinery, equipment, container; only onto hard surfaces, **no direct application on plants/crops**)

Horticulture (fungal/mushroom growing, vegetables (seedling production), root and tuber vegetables, brassica vegetables, bulb crops: standing areas, surfaces (storage rooms, culture rooms, machine shops, machinery, equipment, container; only onto hard surfaces, **no direct application on plants/crops**)

The intended methods of application consist of pouring of foam, directed course spraying or foaming or dipping. These applicationsa are normally done once between the cultivation periods (or storage periods for potatoes) as precautions. Small tools like knifes or secateurs will be dipped for 3 minutes in a solution between working steps. For details refer to Appendix 2.1: GAP table.

IIIA1 6.2.8.7 Resistance risk assessment of unrestricted use pattern

Since there are no resistance or cross-resistance to benzoic acid is known for plant pathogens, no assessment of unrestricted use pattern with MENNO Florades has been conducted.

IIIA1 6.2.8.8 Test methods

Since there are no resistance or cross-resistance to benzoic acid is known for plant pathogens, no tests with MENNO Florades have been conducted.

IIIA1 6.2.8.9 Acceptability of the resistance risk

Since there are no resistance or cross-resistance to benzoic acid is known for plant pathogens, no tests with MENNO Florades have been conducted.

IIIA1 6.2.8.10 Management strategy

Since there are no resistance or cross-resistance to benzoic acid is known for plant pathogens it is not foreseen to establish a separate monitoring program.

IIIA1 6.2.8.11 Implementation of the management strategy

Since there are no resistance or cross-resistance to benzoic acid is known for plant pathogens, It is not foreseen to establish a separate monitoring program.

IIIA1 6.2.8.12 Monitoring, reporting and reaction to changes in performance

Since there are no resistance or cross-resistance to benzoic acid is known for plant pathogens, it is not foreseen to establish a separate monitoring program.

Possible development of resistance or cross-resistance:
No resistance or cross-resistance of plant pathogens to benzoic acid has been observed so far and the risk for the development of resistance is considered to be low. Therefore no resistance management strategy is recommended.

IIIA1 6.3 Economics

No EC data requirement

IIIA1 6.4 Benefits

No EC data requirement

IIIA1 6.4.1 Survey of alternative pest control measures

This is not an EC data requirement.

IIIA1 6.4.2 Compatibility with current management practices including IPM

This is not an EC data requirement.

IIIA1 6.4.3 Contribution to risk reduction

This is not an EC data requirement.

IIIA1 6.5 Other/special studies

No further studies have been conducted.

IIIA1 6.6 Summary and assessment of data according to points 6.1 to 6.5

Preliminary range-finding tests, not intended for application

Efficacy was tested against nematodes, *Taphrina deformans* on peach trees, *Ophiostoma quercus*, a deciduous tree pest, against fungi on panicle cuttings of orchids (*Phalaenopsis* and *Miltonia*), against Pepino Mosaic Virus (PepMV) infecting tomato plants (fruits), and other organisms. There were encouraging results achieved, also against potato scab directly applied on tubers. However, currently no further extensions of the existing GAP is planned.

Minimum effective dose tests (here: suspension tests or inoculum tests on plants, respectively)

At time of test performance, no EPPO guideline was available (but German BBA guideline) and only very few contract laboratories are able to test the product under GLP conditions. However, German experts have performed the tests being specialized in this research area at university.

MENNO Florades with benzoic acid as active ingredient is a suitable tool for disinfection. The results presented in this dossier support following concentrations:

- For control of bacterial harmful organisms 3 minutes at 1 % are sufficient. However, since they are often combined for control of fungal harmful organisms, prolonged exposure is more suitable.
- For control of fungal harmful organisms 1 % concentration combined with a prolonged exposure time may already be sufficient for some species. At 2 % after 4 hours, 100 % of the tested fungi were controlled.
- Virus and viroids need somehow higher concentrations and prolonged exposure time for being inactivated. More details are provided under point 6.1.3

In addition to that and to enhance the effectiveness, it is recommended to clean any material very thoroughly before disinfection.

Efficacy tests

Bacteria:
Against bacteria, the suspension tests have shown that the complete efficacy is usually reached at 1 % within 3 minutes or 5 minutes, depending on the minimum tested disinfection time in the tests. The trials performed in the practice were not conducted with samplings after 3 or 5 minutes, but 15 to 60 minutes. These data were taken as minimum disinfection time for the tested pathogens.

To reduce the number of uses, and according to the practice, bacteria and fungi are usually disinfected at the same time. Therefore, a maximum disinfected time of 16 hours is applied for the 1 % solution and 4 hours for the 2 % solution of MENNO Florades.

Fungi:
Total control of fungi has been achieved at 2 % MENNO Florades after 4 hours exposure, but the bulk of species (exception: Mucor sp.) may also be controlled at 1 % after 16 hours exposure. Based on these results, following rates are proposed:

- Control at 1 % MENNO Florades: 16 hours disinfection OR
- Control at 2 % MENNO Florades: 4 hours disinfection

Viruses and viroids:
For the control of viruses and viroides generally 1 % concentration of Menno Florades should be combined with at least 4 hours disinfection time, 2 % with 8 hours and 4 % with 1 hour for surfaces and 3 minutes for small tools. There are few exceptions, i.e. need an extended time at 4 %, this should be stated on the label. A proposal was made to classify the viruses and viroids and to group them into the above mentioned scheme:

Table 6.6-2: Classification of viruses and viroids

Pathogen	Minimum recommended concentration and exposure time for inactivation of virus and viroid species		
	1 %	2 %	4 %
Viruses and viroids: Easy to inactivate (maximum for the product application: 1 %, max. 16 hours)			
Pelargonium leaf curl tombusvirus	1 hour	1 hour	1 hour
Potato spindle tuber viroid	1 hour	1 hour	1 hour
Arabis mosaic nepovirus	Not tested	1 hour	1 hour
Chrysanthemum stunt viroid	Not tested	1 hour	1 hour
Pelargonium line pattern virus	Not tested	1 hour	1 hour
Tomato spotted wilt tospovirus	4 hours	1 hour	1 hour
Cymbidium mosaic virus	4 hours	4 hours	4 hours
Viruses and viroids: Not easy to inactivate (maximum for the product application: 2 %, max. 16 hours)			
Melon necrotic spot carmovirus	No incativation within 16 h	1 hour	1 hour
Pepino mosaic potexvirus	No incativation within 16 h	8 hours	1 hour
Zucchini yellow mosaic potyvirus	No incativation within 16 h	8 hours	1 hour
Pelargonium flower break carmovirus	16 hours	8 hours	1 hour
Viruses and viroids: Difficult to inactivate (maximum for the product application: 4 %, max 16 hours)			
Tobacco streak virus	16 hours	16 hours	1 hour
Bell Pepper mottle Virus	No incativation within 16 h	No incativation within 16 h	1 hour
Odontoglossum ringspot tobamovirus	No incativation within 16 h	No incativation within 16 h	1 hour
Pepper mild mottle tobamovirus	No incativation within 16 h	No incativation within 16 h	1 hour
Tobacco mosaic tobamovirus	No incativation within 16 h	No incativation within 16 h	16 hours

Label proposal:

For disinfection: No direct treatment of plants or plant products

Thoroughly wash all surfaces and equipment to remove all deposits and organic material before treatment. Dilute MENNO Florades® with water at the required rates according to target organism(s) as set out in the table.

Table 6.6-3: Proposed minimum MENNO Florades concentrations against bacterial, fungal and viral diseases

Application area	Application technique	Pests	Dilution	Minimum time for efficient disinfection	Maximum time (as applied for the product application)**
Protected rooms (Greenhouse, Indoor) in agriculture, horticulture and floriculture, disinfection of surfaces, tools and culture vessels/containers, no direct treatment on plants/crops	Directed coarse spray, foaming (lathering), watering (pouring of aqueous solution or foam), flooding	Viruses and viroids easy to inactivate*	1 %	4 hours	16 hours
		Viruses and viroids easy and not easy to inactivate*	2 %	8 hours	16 hours
		All viruses and viroids with exception of Tobacco mosaic tobamovirus	4 %	1 hour	16 hours
		Tobacco mosaic tobamovirus	4 %	16 hours	16 hours
		Fungi plus bacteria with exception of Mucor	1 %	16 hours	16 hours
		All fungi plus bacteria	2 %	4 hours	16 hours

		Bacteria only	1 % OR 2 %	1 hour OR 0.5 hours	16 hours
Small tools (cutter, knives, secateurs etc.)	Dipping (replace dip daily)	Viruses, viroides, fungi, bacteria	4 %	3 min	3 min

* Please see list of virusses beneath
** This column is not thought for the label.

Diseases controlled

Fungi (including permanent mould): *Alternaria*, *Aspergillus*, *Botrytis*, *Cercospora*, *Chalara*, *Colletotrichum*, *Cylindrocladium*, *Dactylium*, *Didymella*, *Erysiphe*, *Fusarium*, *Helminthosporium*, *Mucor*, *Ophiostoma*, *Peronospora*, *Pythium*, *Phytophthora*, *Ramularia*, *Rhizoctonia*, *Rhizopus*, *Thielaviopsis*, *Trichoderma*, *Verticillium*, etc.

Bakteria: *Acidovorax*, *Agrobacterium*, *Clavibacter*, *Erwinia*, *Pseudomonas*, *Ralstonia*, *Xanthomonas*, etc.

Virusses and Viroids:

Easy to inactivate	**Not easy to inactivate**	**Difficult to inactivate**
Pelargonium leaf curl tombusvirus	Melon necrotic spot carmovirus	Tobacco streak virus
Potato spindle tuber viroid	Pepino mosaic potexvirus	Bell Pepper mottle Virus
Arabis mosaic nepovirus	Zucchini yellow mosaic potyvirus	Odontoglossum ringspot tobamovirus
Chrysanthemum stunt viroid	Pelargonium flower break carmovirus	Pepper mild mottle tobamovirus
Pelargonium line pattern virus		Tobacco mosaic tobamovirus
Tomato spotted wilt tospovirus		
Cymbidium mosaic virus		

Effects on yield and quality

The objective of the application of MENNO Florades is primilary to improve the plant quality by improving hygienic standards. Although the intended use of MENNO Florades does not content direct treatment of plants, plant parts or plant products so far, a future extension of the intended use may include the treatment of potato tubers. Therefore the effectiveness of MENNO Florades as a fungicide and bacteriocide against *Helminthosporium solani*, *Colletotrichum coccodes*, *Rhizoctonia solani* and *Erwinia spp.* in potato was examined. Results of this examination are partly described under the following points in order to demonstrate the effects of MENNO Florades on the qualitity (starch content, size fraction of the harvested potatoes and taste and flavour of previously treated potatoes) and the yield of potatoes (field emergence and yield after planting of previously disinfected and afterwards stored potato tubers). **These trials are also relevant for the treatment of the storage rooms and boxes/containers for potatoes.**

Impact on the quality of plants and plant products
There is no indication that a treatment of potato tubers has an effect of ingredients like starch. Although the starch content after treatment with MENNO Florades appeared slightly lower compared to the control, there were no significant differences between all treatments and the control. Therefore MENNO Florades is comparable to reference products.
Furthermore the sorting of yield tubers resulted in an equal uniform distribution of size comparing the yield of the seeding tubers treated with MENNO Florades with the control, whereas treatment with some of the reference products resulted in a shifting between the size fractions. Therefore a treatment with MENNO Florades shows comparable or even better results than the reference products.

The treatment with MENNO Florades prior to storage did not cause a significant difference in taste or flavour of tubers after storage.

Effects on the processing procedure
The objective of the application of MENNO Florades is to improve the plant quality by improving hygienic standards. MENNO Florades is not intended to be used for direct treatment of plants or plant products. Therefore no effects on the processing procedure are examined so far.

Effects on the yield of treated plants and plant products
Although plants or plant products are not directly treated, the use as fungicide and bacteriocide within a future extension of the intended use will contain the treatment of potato tubers. In this context effect of a treatment with MENNO Florades on the field emergence after planting and the yield was examined.

Effects on the field emergence of treated tubers
Depending on the location of the trial and the application rate the field emergence from potato tubers effects from a direct MENNO Florades treatment vary. The percentage of emerged sprouts is between 81.5 to 95.1 % after MENNO Florades treatment and between 91.3 to 97 % after treatment with the reference products. In the trials 07-57 and 07-63 the field emergence in the control and after MENNO Florades showed comparable results. In the trials 07-46 and 07-56 the emergence after MENNO Florades treatment is even higher compared to the control. In trial 07-62 the field emergence was affected in one trial side, whereas in the other location only a slight negative effect after a MENNO Florades treatment was observed. In trial 07-64 in all locations the field emergence is lower after MENNO Florades treatment of the tubers. However, the same effect was observed after treatment with the reference product, which has – in contrast to MENNO Florades – authorization for the direct treatment of tubers.

MENNO Florades is not intended to be used for direct treatment of plants or soil so far. In this context these results represents worst case scenarios. In case of disinfected storage rooms, the tubers will not get in contact with the application rates used in the reported trials. For a future extension of the intended uses (including the direct treatment of potato tubers), these results have to be reconsidered.

Effects on the yield of previously treated and stored tubers
Tubers treated with MENNO Florades and planted after storage showed comparable yield of potatoes. Only in one location of trial 07-62 the yield was strongly affected by the treatment of the starting material (tubers used for planting) with MENNO Florades (application rate 800 mL/ha), whereas on two other locations the same application rate showed results comparable to the control. This sporadic effect was also observed in case of the reference products. Thus a treatment with "Monceren Plus" caused reduced yield in the trials 07-64 and 07-62, wheras in another locations even positive effects were observed.

Although MENNO Florades is not intended to be used for direct treatment of plants or plant parts so far, a treatment of seeding potatoes showed comparable results in the yield. In case of disinfected storage rooms, the tubers will not get in contact with the application rates used in the reported trials. For a future extension of the intended uses (including the direct treatment of potato tubers), these results have to be reconsidered.

Adverse effects
Phytotoxicity to host crop
A general statement concerning phytotoxicity cannot be given because of the different raising conditions and the innumerable species of ornamental plants.

Unintentional splashes on adjacent plants in greenhouses during treatment may lead to temporary spots of discolouration on leaves and blossoms, but this will only happen accidentally. Phytotoxicity was only reported rarely on some species. So the shoots of orchidees were affected after treatment with 10 % MENNO Florades. However, this concentration is 2.5-fold higher than the highest intended concentration. In any case it is recommended to perform a tolerance test with some nursery plants before treating the whole culture, especially in the case of produce ready for sale. Pelargonium and Elatiorbegonia showed lesions at the leaf marginal already after application of lower MENNO Florades concentrations, whereby in general Elatiorbegonia was more sensitive compared to Pelargonium. Anyhow the intended uses do not content the direct application on plants. In case of disinfection procedures close to existing cultures, a narrower spray spurt should be used.

MENNO Florades is not intended to be used for direct treatment of plants or plant products. Nevertheless when treating surfaces, on which plants in pots are placed (especially ebb-flood benches, fleece mats) and culture vessels, intake via the roots is possible. Because of the low concentration of benzoic acid, no phytotoxic effect will occur. However, if freshly potted plants with dry root balls are dipped directly into puddles of MENNO Florades, or placed on fleece mats saturated with MENNO Florades, alcohol-burning at the roots was thought to be possible, but no effects were observed during testing.

If knives are treated before graft, the intake via the cut surface is possible. However, the low concentration of benzoic acid will not cause any phytotoxic effects. Tests with treated knives have not shown any phytotoxic effects at the treated plants.

If benzoic acid is incorporated into plants, normal metabolism and excretion in plants will take place, because benzoic acid is a natural component of plants.
However, in the instructions for use it is recommended to perform a tolerance test with some nursery plants before treating surfaces, equipment or tools which may have direct contact to plants. This precaution is sufficient to detect possible phytotoxic effects in advance, when applying MENNO Florades to new plant species.

Regarding the treatment of potato tubers general statement concerning phytotoxicity cannot be given. In most of the trials no negative effects were observed. In some trial sites the treatment of potato tubers affected the subsequent emergence of the sprouts at high concentrations (50 % product in solution with water), which are not relevant for the current use on boxes, containers and storage rooms. Additionally the storage rooms will be well dried before storage of the tubers. For a future extension of the intended uses (including the direct treatment of potato tubers), these results have to be reconsidered.

Adverse effects on health of host animals
No EC data requirement

Adverse effects on site of application
The intended uses contain application on surfaces of storage rooms, buildings, machine halls and greenhouses, furthermore equipment (containers and cultivation vessels, tables) and tools (e.g. knifes, secateurs).
Since containers and cultivation vessels are normally made of plastic (e.g. Polyethylene), no negative effect is expected.
The corrosion of copper concerns e.g. tables in greenhouses. Since the corrosion effect is not intense (minor change of weight), the effect is negligible. The pure light metal aluminum has a naturally dull silver-gray appearance because of a rapidly forming thin oxide layer. This impenetrable oxide layer (about 0.05 µm) makes pure aluminum highly resistant to further corrosion.
Since knifes, secateurs etc. are made of stainless steel, acute exposure to MENNO Florades will not affect these tools.
Storage rooms are normally made of concrete and wood which are not affected by MENNO Florades.
Since MENNO Florades (or the contained acids respectively) causes corrosion to conventional steel, surfaces with obstructed steel should be controlled regularly after application.

Copper, steel and galvanized metal were sensitive to corrosion after four treatments with the undiluted concentrate, which can easily be explained by the activity of the acids in MENNO Florades. However, since the intended use does not contain the application of the undiluted concentrate and the materials will not have contact to the solution for 24 hours, the conditions within the studies can be rated as a worst case scenario.

Adverse effects on beneficial organisms (other than bees)
No signs of impact on beneficial and other non-target organisms have been reported since the introduction of MENNO Florades as disinfectant in 1998. Beneficial organisms in this special case are defined as microorganisms intentionally applied by the user (e.g. *Bacillus thuringensis*-preparations against pests). Use of such beneficial organisms and disinfectants at the same time obviously is not good agricultural practice.

Adverse effects on soil living organissm

Earthworms:
The No Observed Effect Concentration (NOEC) for Benzoic acid summarizing the endpoints mortality, body weight and reproduction of *Eisenia fetida* after 8 weeks of exposure in artificial soil was determined to be 384 mg Benzoic acid/kg soil dry weight.
The LOEC was determined to be > 384 mg Benzoic acid/kg soil dry weight. The EC*50* for reproduction and biomass was not determined since no reduction of body weight and reproduction occurred.

Collembola:
From the application method with quartz sand it can be assumed that there is no effect on mortality of collembola and no statistically significant inhibition of reproduction at the tested concentration level.
Taken into account mortality and reproduction data from the application method with buffer solution, the NOEC has to be set to 143 mg/kg DW.

Soil Microflora:
In general an impact on populations of other microorganisms (bacteria, fungi, viruses and viroids) may be expected because benzoic acid, like any other disinfectant, does not act selective against pathogenic organisms only. However, a long-term effect on other non-target microorganisms is unlikely, because benzoic acid is not persistent.
The effects of Benzoic acid on the metabolic activity of soil micro-organisms were determined according to OECD Guideline 216 (Nitrogen transformation test). Benzoic acid did not affect the microbial nitrate formation rate (differences < 25 %) after 7, 14 and 28 days when applied at 38.4 mg/kg dw soil and 192 mg/kg dw soil, corresponding to 5 times maximum application rate of 144 kg Benzoic acid/ha. The conversion from kg/ha to mg/kg is based on a soil density of 1.5 g/cm³ and a soil layer of 5 cm. The obtained results indicate that Benzoic acid is not expected to cause any long term detrimental effects on nitrogen turnover in soil under normal conditions.

Risk assessment for soil organisms:
With respect to the common construction of facilities in horticulture and agriculture, the PECsoil value calculated from a rate reaching soil of 28800 g Benzoic acid/ ha does not play a role for eco-toxicological risk assessment and was not considered further.

- This worst case calculation assumes that the total amount of application solution (max. 320 L of a 4% solution per hectare) will enter the soil below the greenhouse. Since most glasshouses, machine halls and other protected areas in professional agriculture and horticulture are built with a solid foundation (e.g. concrete), this scenario is very unlikely.
- Taken into account greenhouses on bare soil, but constructed as permanent buildings, the soil below is usually very compact and shows a lack of organic matter (substrate for soil organisms). Thus the site is unsuitable for soil dwellers (soil macro-organisms), but not for soil micro-organisms.

Soil macro-organisms: The PECsoil value calculated from a rate reaching soil of 28.8 g Benzoic acid/ ha plays a role for organisms that are located in the soil around the greenhouse. In this case, the emission from greenhouse was considered with 0.1%, as suggested for the risk assessment in surface water. Thus, only the maximal/ initial PECsoil of 0.038 mg Benzoic acid / kg soil was taken into account for the risk towards soil non-target earthworms and macro-organisms.

Soil micro-organism: The full rate was considered for risk assessment, because it is assumed that soil microorganisms occur even under unfavourable conditions in compacted bare soil in greenhouses.
For soil microcorganisms the full rate was considered to be relevant, because

Table 6.6- 4: Summary of PEC_{soil} calculations for the active substance Benzoic acid

Benzoic acid	*0% crop interception* PEC initial [mg a.i./kg soil at 5 cm]
Rate reaching soil: 28800 g Benzoic acid /ha (Assuming that the total amount of application solution (max. 320 L of a 4% solution per hectare) will enter the soil below the closed structure – scenario is considered unlikely and was not addressed for birds & mammals, aquatic species, non-target arthropods and soil-dwelling macro-organisms, but for soil microorganisms.	38.4
Rate reaching soil: 28.8 g Benzoic acid / ha (0.1% deposition rate from the worst case application of 28800 g a.i./ha in closed structures)	0.038

Table 6.6-5: Toxicity/exposure ratios for earthworms and other soil non-target macro-organisms.

Test substance	Species	Test type	Endpoint [mg a.s./kg soil d.w.]	Initial/ maximal PEC_{soil} [mg a.i./kg soil dw]	TER	TER risk assessment trigger
Benzoic acid	*Eisenia fetida*	Acute	*Not required / No effect observed*			
		Long term	NOEC = 384	(Rate reaching soil: 28.8 g Benzoic acid /ha) 0.038	10105	5
Benzoic acid	*Folsomia candida*	Acute	*Not required / No effect observed*			
		Long term	NOEC = 143	(Rate reaching soil: 28.8 g Benzoic acid /ha) 0.038	3763	5

Table 6.6- 6: Effects on soil micro-organisms

Test	Duration	Concentration	Results	Reference
Nitrogen transformation	28 days	192 mg Benzoic acid/ kg soil DW corresponding to 5 times the maximum application rate	No effects > 25%	New data on the active substance (KIIA-8.10.1/01)

The trigger values laid down in Annex VI were not exceeded, indicating that MENNO Florades and the active substance Benzoic acid does not pose a risk to soil macro- and microorganisms.

Adverse effects on parts of plant used for propagating purposes
No signs of undesired impact on plants or plant products to be used for propagation have been reported since the introduction of MENNO Florades as disinfectant in 1998. MENNO Florades is used in companies and nurseries specialized in plant propagation to prevent infections.

Impact on succeeding crops
No impact is expected because of the short degradation time in soil. Half-life rate in soil is less than one day.

Impact on other plants including adjacent crops
The formulation is not an herbicide and not used in the field. Therefore no trials have been conducted.

Unintentional splashes on adjacent plants in greenhouses during treatment may lead to temporary spots of discolouration on leaves and blossoms, but this will only happen accidentally. Phytotoxicity was only reported rarely on some species. So the shoots of orchidees were affected after treatment with 10 % MENNO Florades. However, this concentration is 2.5-fold higher than the highest intended concentration.

Possible development of resistance or cross-resistance
No resistance or cross-resistance to benzoic acid is known for plant pathogens. No tests have been conducted and no management strategy is necessary.

Economics
No EC data requirement

Benefits
No EC data requirement

Survey of alternative pest control measures
No EC data requirement

Compatibility with current management practices including IPM
No EC data requirement

Contribution to risk reduction
No EC data requirement

Other/special studies
No further studies have been conducted.

Overall conclusion

All the data regarding the efficacy of the product have been submitted. These data demonstrate that MENNO Florades fulfils all criteria for the authorization of preparations described in Directive 97/57/EC (Uniform Principles, Annex VI to Directive 91/414/EEC).

Unintentional splashes on adjacent plants in greenhouses during treatment may lead to temporary spots of discolouration on leaves and blossoms, but this will only happen accidentally. Phytotoxicity was only reported rarely on some species after treatment high concentrations (10 % and 50 % solutions) exceeding the intended concentration (1 - 4 %) by far.

In the instructions for use it is recommended to perform a tolerance test with some nursery plants before treating surfaces, equipment or tools which may have direct contact to plants. This precaution is sufficient to detect possible phytotoxic effects in advance, when applying MENNO Florades to new plant species.

Summary and assessment of data according to points 6.1 to 6.5
Minimum effective dose:
All efficacy tests included testing of different concentrations of MENNO Florades at different exposure times. Therefore no special trials on minimum effective dose are required.
Efficacy:
Efficacy was tested against a variety of bacteria, fungi, viruses, and viroids which are phytopathogenic

for different crops. The combination of the concentration and exposure time necessary for control/inactivation depend on the pathogen. The following concentrations/exposure times can be recommended.

Bacteria and fungi/disinfection of surfaces by spraying, foaming, watering or flooding:

1%/16h or 2%/4h

Advice may be given in the instructions of use that the exposure time can be further reduced if disinfection is intended only against bacteria.

Viruses and viroids/disinfection of surfaces by spraying, foaming, watering or flooding:

1%, 2%, 4%/16h

Viruses and viroids may be classified according to the difficulty for inactivation. More detailed information on the classification and advice on the possibility of reducing the exposure time may be given in the instructions for use.

Bacteria, fungi, viruses and viroids/disinfection of small tools by dipping:

4%/3min

Phytotoxicity:

No direct application of MENNO Florades to plants is intended. Direct contact to the disinfectant is limited to residues directly after disinfection or unintended contact to plants. No phytotoxicity was observed in the efficacy trials. Use of MENNO Florades according to the instructions is unlikely to cause phytotoxicity. Only when MENNO Florades was directly applied to the plants it caused phytotoxic effects in some cases. However, as a measure of precaution it is recommended in the instructions for use to perform a tolerance test with some plants before treating surfaces, equipment or tools which may have direct contact to plants.

Resistance:

The risk for the development of resistance is considered to be low. Therefore no resistance management strategy is recommended.

Adverse effects on beneficial organisms (other than bees):

MENNO Florades will not affect populations of relevant arthropods due to the specified application pattern.

IIIA1 6.7 List of test facilities including the corresponding certificates

Table 6.7- 1: Test facilities

Test facility	Country (trial site)	Trial ID							GEP-certificate
		Bacteria	Fungus	Virus	Viroid	Phytotoxology	Effects on yield and quality	Adverse effects	
Research Institute of Geisenheim, Special Field Phytomedicine, Geisenheim (Forschungsanstalt Geisenheim, Fachgebiet Phytomedizin, Geisenheim)	DE	MEN-07-01 MEN-07-03 MEN-07-05 MEN-07-06 MEN-07-35 MEN-07-37 MEN-07-40 MEN-07-42 MEN-07-43	MEN-07-07 MEN-07-38 MEN-07-39 MEN-07-40 MEN-07-41 MEN-07-43 MEN-07-44						GEP certificate overleaf to this table
FLORA-NOVA Pflanzen GmbH, Hillscheid	DE	MEN-07-04	MEN-07-04		MEN-07-04				Studies were conducted before implementation of GEP in 1999
Confederate Research Institute for fruit growing, viniculture and horticulture, Wädenswil (Eidgenössische Forschungsanstalt für Obst-, Wein- und Gartenbau, Wädenswil)	CH	MEN-07-12							Studies were conducted before implementation of GEP in 1999
Albert-Ludwigs-Universität Freiburg, Institute for Forest Botany and Tree Physiology; Freiburg (Albert –Ludwig-Universität Freiburg, Institut für Forstbotanik und Baumphysiologie, Freiburg)	DE		MEN-07-35	MEN-07-13		MEN-07-13 MEN-07-51 MEN-07-52			Studies were conducted before implementation of GEP in 1999

Test facility	Country (trial site)	Trial ID							GEP-certificate
		Bacteria	Fungus	Virus	Viroid	Phytotoxology	Effects on yield and quality	Adverse effects	
Humboldt-University of Berlin, Agricultural-horticultural faculty, Institute for Horticultural Sciences, special field phytomedicine; Berlin (Humboldt-Universität zu Berlin, Landwirtschaftlich-Gärtnerische Fakultät, Institut für Gartenbauwissenschaften, Fachgebiet Phytomedizin)	DE			MEN-07-16 MEN-07-18 MEN-07-19 MEN-07-20 MEN-07-21	MEN-07-15 MEN-07-17	MEN-07-15 MEN-07-21			No GEP
Horticultural Research International, Wellesbourne, Warwick	UK		MEN-07-24						No GEP
Universität Hannover, Institute for Plant Diseases and Plant Protection, Hannover (Universität Hannover, Institut für Pflanzenkrankheiten und Pflanzenschutz, Hannover)	DE			MEN-07-34	MEN-07-34				Studies were conducted before implementation of GEP in 1999
Dienstleistungszentrum Ländlicher Raum (DLR) Rheinhessen – Nahe - Hunsrück, Location Bad Kreuznach	DE		MEN-07-45						Facility is listed as certified GEP test facility by the German authorities [23]
Alberta Agriculture, Food and Rural Development, Crop Diversification Centre South, Alberta	CA	MEN-07-47	MEN-07-47	MEN-07-47					Not applicable since Canada is not member of the European Union.

[23] http://www.bvl.bund.de/SharedDocs/Downloads/04_Pflanzenschutzmittel/zul_dok_GEP_liste.pdf?__blob=publicationFile

Test facility	Country (trial site)	Trial ID							GEP-certificate
		Bacteria	Fungus	Virus	Viroid	Phytotoxology	Effects on yield and quality	Adverse effects	
Georg August-University of Göttingen, Institute for Plant Pathology and Crop Protection, Göttingen (Georg August Universität Göttingen, Institut für Pflanzenpathologie und Pflanzenschutz, Göttingen)	DE	MEN-07-50	MEN-07-50						No GEP
Chamber of Agriculture, Bonn (Landwirtschaftskammer Rheinland, Bonn)	DE					MEN-07-58			Studies were conducted before implementation of GEP in 1999
Ministry of Food, Agriculture and Fisheries, / Danish Institute of Agriculture Sciences, Department of Crop Protection, Flakkebjerg	DK					MEN-07-53			Studies were conducted before implementation of GEP in 1999
Beratungsring Azerca-Süd, Großostheim	DE					MEN-07-54			Studies were conducted before implementation of GEP in 1999
Dr.U.Noak-Laboratorien, Deutschland	DE							MEN-07-66 MEN-07-67 MEN-07-68	GEP certificate overleaf to this table
Bayerische Landesanstalt für Landwirtschaft Institut für Pflanzenschutz, Freising	DE	MEN-07-63* MEN-07-64*	MEN-07-63* MEN-07-64*			MEN-07-63 MEN-07-64			Facility is listed as certified GEP test facility by the German authorities [24]

[24] http://www.bvl.bund.de/SharedDocs/Downloads/04_Pflanzenschutzmittel/zul_dok_GEP_liste.pdf?__blob=publicationFile

Test facility	Country (trial site)	Trial ID							GEP-certificate
		Bacteria	Fungus	Virus	Viroid	Phytotoxology	Effects on yield and quality	Adverse effects	
Bayerische Landesanstalt für Bodenkultur und Pflanzenbau (LBP), Freising	DE	MEN-07-62*	MEN-07-62*			MEN-07-62			GEP certificate overleaf to this table
Applied Plant Research, Research Unit AGV (Praktijkonderzoek Plant & Omgeving BV), Lelystad	NL						MEN-07-46	MEN-07-46	GEP certificate overleaf to this table

* = Discussed under IIIA1-6.1.4

GLP certificates are provided in KIIIA1-6.6/01 (BAD) under point 6.7

Appendix 1: List of data submitted in support of the evaluation

	Author	**Year**	**Title** **Source (where different from company)** **Company, Report No.** **GLP or GEP status (where relevant)** **Published or Unpublished**	**Vertebrate study Y/N**	**Data protection claimed Y/N**	**Justification if data protection is claimed**	**Owner**	**Previous evaluation**
KIIIA1-6.6/01	Meyer, J., Heimann, D.	2014	Biological Assessment Dossier Disinfection of Surfaces, Equipment and Tools in Green-houses and other Protected Areas - Control of Plant Pathogens (Bacteria, Fungi, Viruses) DHD-Consulting GmbH, Hildesheim, Germany Report no.: MEN-2013-11 (Update-1) Non-GLP, unpublished	N	Y	New study submitted for the purpose of renewal	MEN	*Submitted for the purpose of renewal*

List of data submitted in support of the zRMS

Annex Point	Author	Year	Title Source Report-No. GLP/GEP Published Authority registration No./JKI-No.	Data protection claimed (J=Yes O=Open N=No)	Owner	How considered in dRR Study-Status / Usage
MIIIA1 Sec 1	MENNO Chemie-Vertrieb GmbH	2014	dRR - B1 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725124/397566	O	MEN	Y
MIIIA1 Sec 6	MENNO Chemie-Vertrieb GmbH	2014	dRR - B6 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725142/397568	O	MEN	Y
MIIIA1 Sec 7	MENNO Chemie-Vertrieb GmbH	2014	dRR - B7 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725173/397569	O	MEN	Y
Document N	MENNO Chemie-Vertrieb GmbH	2014	dRR - B8 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725184/397570	O	MEN	Y
MIIIA1 Sec 6	MENNO Chemie-Vertrieb GmbH	2014	dRR - B6 - nat. add. - DE - 034407-00/00 - MENNO Florades O/O N 2725188/397572	O	MEN	Y
Document J	MENNO Chemie-Vertrieb GmbH	2014	dRR - C - DE - 034409-00/00 - MENNO Florades N/O N 2725193/397573	J	MEN	Y

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Document N	MENNO Chemie Vertrieb GmbH	2013	Form to notify intended zonal applications under Regulation (EC) No 1107/2009 O/O N 2725204/397576	O	MEN	Y
KIIIA1 3.9	Anonymous	2014	Gebrauchsanleitung O/O N 2725412/397580	J	MEN	Y
KIIIA1 3.9	Anonymous	2014	Gebrauchsanleitung O/O N 2725413/397581	J	MEN	Y
MIIIA1 Sec 1	MENNO Chemie-Vertrieb GmbH	2014	dRR - B1 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725496/397582	O	MEN	Y
MIIIA1 Sec 6	MENNO Chemie-Vertrieb GmbH	2014	dRR - B6 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725556/397584	O	MEN	Y
MIIIA1 Sec 7	MENNO Chemie-Vertrieb GmbH	2014	dRR - B7 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725564/397585	O	MEN	Y

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Document N	MENNO Chemie-Vertrieb GmbH	2014	dRR - B8 - core assess. - DE - 034407-00/00 - MENNO Florades O/O N 2725565/397586	O	MEN	Y
Document N	MENNO Chemie-Vertrieb GmbH	2014	dRR - A - DE - 034409-00/00 - MENNO Florades O/O N 2725566/397587	O	MEN	Y
Document N	MENNO Chemie-Vertrieb GmbH	2014	dRR - A - DE - 034409-00/00 - MENNO Florades O/O N 2725577/397588	O	MEN	Y
MIIIA1 Sec 6	MENNO Chemie-Vertrieb GmbH	2014	dRR - B6 - nat. add. - DE - 034407-00/00 - MENNO Florades O/O N 2725589/397590	O	MEN	Y
Document J	MENNO Chemie-Vertrieb GmbH	2014	dRR - C - DE - 034409-00/00 - MENNO Florades N/O N 2725639/397591	J	MEN	Y
KIIIA1 6	Meyer, J., Heimann, D.	2014	Biological Assessment Dossier - MENNO Florades N/N N 2732128/397592	J	MEN	Y

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KIIIA1 6.1.1	Lauenstein, G.	2003	Final Report on testing the Menno Florades effectiveness against potato nematodes by applying different application methods. MEN-07-31 N/N N 2732140/397593	J	MEN	Y
KIIIA1 6.1.1	Lole, M.	2011	Narcissus: Disinfectant for the Control of Stem Nematode on Bulb Handling Hardware and the Fabric of Buildings MEN-07-33 N/N N 2732141/397594	J	MEN	Y
KIIIA1 6.1.1	Albert, G.	2005	Report on the effect of benzoic acid (MENNO Florades®) on the causal agent of peach leaf curl (Taphrina deformans). MEN-07-45 N/N N 2732142/397595	J	MEN	Y
KIIIA1 6.1.1	Wohanka, W., Fehres, H., Wulf, A.	2004	Test of fungicidal activity of MENNO-Florades against Ophiostoma q uercus in laboratory test, (according to BBA-guideline 16-4). MEN-07-48 N/J N 2732144/397596	J	MEN	Y
KIIIA1 6.1.1	Büttner, C.	2002	Expertise on Menno-Florades, Here: Pepino mosaic virus (PEPMV). MEN-07-19 N/N N 2732145/397597	J	MEN	Y

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KIIIA1 6.1.1	Billenkamp, N.	2001	Report on the disinfection of trays used for tobacco plant seedlings with M&ENNO® TER forte and MENNO Florades® MEN-07-49 N/J N 2732146/397598	J	MEN	Y
KIIIA1 6.1.1	Anonymous	1999	Bekämpfung der Blatt- und Stengelbakteriose (Xanthomonas campestris pv. Begoniae) an Begonien 1999 MEN-07-59 N/N N 2732147/397599	J	MEN	Y
KIIIA1 6.1.1	Wohanka, W.	2004	Einsatz von MENNO-Florades im Spritzverfahren zur Bekämpfung von Bakteriosen an Pelargonien und Elatiorbegonien MEN-07-60 N/J N 2732148/397600	J	MEN	Y
KIIIA1 6.1.1	Büttner, C.	1998	Expert Opinion on the effectiveness of MENNO Florades and Venno OxygenHere: Effectiveness comparison between both these preparations with respect to disinfecting panicle cuttings of orchids. MEN-07-14 N/N N 2732150/397601	J	MEN	Y
KIIIA1 6.1.1	Wohanka, W., Weishaupt, D.	1996	Bactericidal effectiveness test of Florades against Clavibacter michiganensis ssp. michiganensis. MEN-07-01 N/N N 2732164/397602	J	MEN	Y

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KIIIA1 1.7	Anonymous	2011	Europäischen Arzneibuch - Benzoesäure - Acidum benzoicum - Definition, Eigenschaften, Prüfung auf Identität und Reinheit, Gehaltsbestimmung Deutscher Apotheker Verlag Birkenwaldstraße 44 70191 Stuttgart Ph. Eur. 7. N/O J 2732165/397603	N	LIT	Y
KIIIA1 6.1.2	Wohanka, W., Weishaupt, D.	1997	Bactericidal effectiveness test of Florades against Clavibacter michiganensis ssp. sepedonicus and Pseudomonas solanacearum. MEN-07-03 N/N N 2732182/397604	J	MEN	Y
KIIIA1 6.1.2	Wölk, M.	1996	Expert Opinion on the disinfectant Florades (Menno Chemie) and its practical application in horticulture. MEN-07-04 N/N N 2732184/397605	J	MEN	Y
KIIIA1 6.1.3	Wölk, M.	1996	Expert Opinion on the disinfectant Florades (Menno Chemie) and its practical application in horticulture. MEN-07-04 N/N N 2732185/397606	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Weishaupt, D.	1996	Bactericidal effectiveness test of Florades against Clavibacter michiganensis ssp. michiganensis. MEN-07-01 N/N N 2732186/397607	J	MEN	Y

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KIIIA1 6.1.3	Wohanka, W., Weishaupt, D.	1997	Bactericidal effectiveness test of Florades against Clavibacter michiganensis ssp. sepedonicus and Pseudomonas solanacearum. MEN-07-03 N/N N 2732187/397608	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W., Weishaupt, D.	1994	Bacterial effectiveness test of Florades against Xanthomonas campestris pv. Pelargonii. MEN-07-05 N/N N 2732188/397609	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Weishaupt, D.	1994	Bacterial effectiveness test of Florades against Xanthomonas campestris pv. Pelargonii. MEN-07-05 N/N N 2732189/397610	J	MEN	Y
KIIIA1 4.1.1	Anonymous	2000	AFP specification: packages (AFP Spezifikation Verpackungsmittel: 1050 ml Flasche,dunkelgrün/Menno) Spez-Nr.6!Verp-Nr:1062 N/O N 2732742/397611	J	MEN	Y
KIIIA1 4.1.1	Anonymous	2000	AFP specification: packages (AFP Spezifikation Verpackungsmittel: 10x1L Karton m. UN-Zul. and further information Spez-Nr.4! Verp-Nr.7057 N/O N 2732743/397612	N	MEN	Y

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KIIIA1 4.1.1	Anonymous	1993	Specification (Spezifikation: Kindersicherheitsverschluss - Kappe, Schraubteil Rd 25) 1133 E N/O N 2732744/397613	N	MEN	Y
KIIIA1 4.1.1	Wienecke, B.-U., Nieruch, A.	2008	AFP correction, certificate of approval (Korrektur 48519.1, Zulassungsschein) and further information D/BAM 4385/4G N/O N 2732745/397614	N	MEN	Y
KIIIA1 4.1.1	Bosma, M.	2007	AFP specification: packages (AFP Spezifikation Verpackungsmittel - 2000ml Griffflasche/Orig.Gew./blau, HDPE B5823 up to 5L Spez-Nr.5! Verp-Nr.1114 N/O N 2732746/397615	N	MEN	Y
KIIIA1 4.1.1	Anonymous	2006	AFP specification packages (Spezifikation Verpackungsmittel - Rasterverschluß für Folienbeutel, Deckel SK 51 OV-U, Spectum, technical data sheet, declarations of compliance and masterbatch) Spez-Nr.10! Verp-Nr.5018 N/O N 2732747/397616	N	MEN	Y
KIIIA1 4.1.1	Anonymous	2004	AFP specification packages (Spezifikation Verpackungsmittel - 10 L Kanister,blau,UN-Zul., certificate of approval for packaging of type 3Hl plastic jerry can of 10 + 12 L) Spez-Nr.5! Verp-Nr.2045 N/O N 2732748/397617	N	MEN	Y

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KIIIA1 4.1.1	Spies, St., Strohmann, D.	2005	Technical datasheet (AST Kunststoffverarbeitung - Technisches Datenblatt EST 20.07 - 20 Liter, certificate of approval 3H1 plastic jerry can 20 and 25 L) 2073-1 N/O N 2732749/397618	N	MEN	Y
KIIIA1 4.1.1	Anonymous	2004	AFP specification packages (Spezifikation Verpackungsmittel 30 L Kanister,blau,UN-Zul/Div.Kunden, certificate of approval 3H1 plasic jerry can 30 L) Spez-Nr.8! Verp-Nr.2015 N/O N 2732750/397619	N	MEN	Y
KIIIA1 4.1.1	Roesler, A., Staaks-Fohl, A.	2009	Certificate of Approval - Mauser Werke - Specification of the design type 220 liter L-Ringfaß Plus/ L-drum plus 9640/1H1 N/O N 2732751/397620	N	MEN	Y
KIIA 8.8.2	Winkelmann, G.	2013	Earthworm (Eisenia fetida), Effects on Reproduction 130611DH 1 RBR15572 O/O N 2759927/397626	J	MEN	Y
KIIIA1 6.1.2	Büttner, C.	2000	Expert opinion Effectivity of MENNO-Florades on viroids N/N N 2764898/397629	J	MEN	Y

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KIIIA1 6.1.2	Büttner, C.	2000	Expert opinion, testing the disinfectant MENNO Florades here: the effectiveness against Pepino mosaic Virus (PepMV) N/N N 2764906/397630	J	MEN	Y
KIIIA1 6.1.2	Büttner, C.	2000	Expert opinion effectivity of MENNO-Florades on viroids N/N N 2764944/397631	J	MEN	Y
KIIIA1 6.1.2	Büttner, C.	2001	Testing the disinfectant MENNO Florades effect on Zucchini yellow mosaic Virus (ZYMV), Melon necrotic spot Virus (MNSV), Pepper mild mottle Virus (PMMoV) and Bell pepper mottle Virus (BePMV) N/N N 2765352/397632	J	MEN	Y
KIIIA1 6.1.2	Büttner, C.	2004	Expert opinion on the virucidal effectivity of the product Menno-Florades on Asparagus under consideration of the Tobacco streak virus N/N N 2765353/397633	J	MEN	Y
KIIIA1 6.1.2	Grogan, H.	2001	In-vitro testing of Mushroom Disinfectant H410 076 N/N N 2765354/397634	J	MEN	Y

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KIIIA1 6.1.2	Wohanka, W.	1995	Pre test for the sensibility of a rifamycin-resistant strain of Xanthomonas campestris pv. Pelargonii against MENNO-Florades V9509 N/N N 2765355/397635	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W.	2001	Results of effectiveness test of plant protection products for disinfection in plant production 2001 N/J N 2765358/397636	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W.	2002	Results of effectiveness test of plant protection products for disinfection in plant production 2002/Fusarium oxysporum (Strain from Elatiorbegonia) N/J N 2765359/397637	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W.	2002	Results of effectiveness test of plant protection products for disinfection in plant production 2002/Fusarium oxysporum f.sp. cyclaminis N/J N 2765360/397638	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W., Fehres, H.	1998	Bacterial and fungicidal effectiveness test of MENNO Florades against various phytopathogenic agents V9803 N/N N 2765362/397639	J	MEN	Y

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KIIIA1 6.1.2	Wohanka, W., Fehres, H.	1999	Fungicidal effectiveness test of MENNO Florades against various pathogens relevant for fungal culture (mushroom) V9916 N/J N 2765364/397640	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W., Fehres, H.	2000	Bacterial and fungicidal effectiveness of MENNO Florades assayed in the Laboratory test V0010 N/J N 2765366/397641	J	MEN	Y
KIIIA1 6.1.2	Wohanka, W., Fehres, H.	2000	Efficacy of the Disinfectants MENNO-Florades and MENNO Ter forte for the control of the new Erica fungus V0008 N/J N 2765367/397642	J	MEN	Y
KIIIA1 6.1.2	Harding, M.W., Howard, R.J.	2005	Evaluation of MENNO-Florades for Efficacy against Selected Bacterial, Fungal and Viral Pathogens of Greenhouse Vegetable Crops N/N N 2765370/397643	J	MEN	Y
KIIIA1 6.1.2	Benker, M.	2004	Influence of MENNO Florades® on the growth of different potato andsugar beet pathogens in a sterile culture N/N N 2765373/397644	J	MEN	Y

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KIIIA1 6.1.3	Wohanka, W., Weishaupt, D., Klingebiel, S.	1996	MENNO Florades effectiveness against xanthomonas campestris pv. pelargonii for knive disinfection with a 2-minute exposure time V9604 N/N N 2765374/397645	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Weishaupt, D., Klingebiel, S.	1995	Disinfecting activity test of Florades against cyclindrocladium spathiphylli in the practice test (surface and Immersion treatment) V9507 N/J N 2765378/397646	J	MEN	Y
KIIIA1 6.1.3	Büttner, C.	1900	Expert opinion on the virudical effect of the disinfectant FLORADES to disinfect Standing areas N/N N 2765380/397647	J	MEN	Y
KIIIA1 6.1.3	Hasler, T.	1998	Test of MENNO Florades for ist effect as a disinfectant on the fire blight pathogen Erwinia amylovora N/N N 2765381/397648	J	MEN	Y
KIIIA1 6.1.3	Büttner, C.	1998	Expert opinion on the effectiveness of MENNO Florades against orchid viruses (Odontoglossum ring spot Virus and Cymbidium mosaic Virus) N/N N 2765383/397649	J	MEN	Y

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KIIIA1 6.1.3	Büttner, C., Bandte, M.	2000	Elimination of plant viruses by horticultural disinfectant N/N N 2765390/397650	J	MEN	Y
KIIIA1 6.1.3	Meiß, E.	1998	Expert evidence: Testing the virucidal activity of the disinfectant FLORADES N/N N 2765391/397651	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Fehres, H.	2000	Bacterial effectiveness of MENNO Florades against Ralstonia solanacearum in a germ carrier test (metal surfaces) V9913 N/J N 2765392/397652	J	MEN	Y
KIIIA1 6.1.4	Bos, D., Veerman, A.	2005	Efficacy Evaluation of Menno Florades as a fungicide against silver scurf in seed potato storage 510394 N/J N 2765547/397660	J	MEN	Y
KIIIA1 6.1.4	Zellner, M., Wagner, S., Weber, B., Beyer, F.	2005	Versuchsergebnisse aus Bayern-Gezielte Bekämpfung von Kartoffelkrankheiten(Blattfrüchte und Mais) N/J N 2765549/397661	J	MEN	Y
KIIIA1 6.1.4	Peters, R.	2003	Follow up of the storage Trial 2002/03 N/N N 2765556/397662	J	MEN	Y

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KIIIA1 6.1.4	Zellner, M., Wagner, S., Weber, B.	2002	Ergebnisse aus Feldversuchen-Versuchsjahr 2001 und 2002-Pflanzenschutz-Blattfrüchte und Mais, Krankheits- und Schädlingsbekämpfung N/J N 2765575/397663	J	MEN	Y
KIIIA1 6.1.4	Zellner, M., Wagner, S., Weber, B., Beyer, F.	2004	Versuchsergebnisse aus Bayern- Gezielte Bekämpfung von Kartoffelkrankheiten(Blattfrüchte und Mais) N/J N 2765576/397664	J	MEN	Y
KIIIA1 6.1.4	Kröcher, C.	2002	Fungal storage rots of potato/Bacterial wet rot on potatoes in storage rooms HR1F02MEN002 N/J N 2765577/397665	J	MEN	Y
KIIIA1 6.2.1	Bos, D:, Veerman, A.	2014	Effectiveness of Menno Florades against silver scurf in potatoes PPO510238 N/N N 2765579/397666	J	MEN	Y
KIIIA1 6.2.1	Böhmer, B.	1996	Examination of your plant protection chemical MENNO FLORADES for licensing the plant compatibility with ornamental plants under glass N/N N 2765585/397667	J	MEN	Y

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KIIIA1 6.2.1	Büttner, C.	1996	Supplemental Report to the expert opinion of 14.07.1998. Effectiveness of Menno-Florades against orchid viruses here: Plant tolerance-especially the blossom tolerance-of Menno Florades on orchids N/N N 2765588/397668	J	MEN	Y
KIIIA1 6.2.1	Büttner, C.	1998	Supplemental Report to the expert opinion of 14.07.1998 and 26.08.1998. Effectiveness of Menno Florades against orchid viruses here: Plant tolerance-especially the tissue cultures-of Menno Florades on orchids N/N N 2765593/397669	J	MEN	Y
KIIIA1 6.2.1	Paaske, K.	1999	Testing of MENNO Florades for possible phytotoxic effect on Viola cornuta 99271 N/N N 2765716/397670	J	MEN	Y
KIIIA1 6.2.1	Köhling, R.	1997	Verträglichkeitsversuch von Florades N/N N 2765717/397671	J	MEN	Y
KIIIA1 6.2	Röhmeier	2003	Testing of tin surfaces for resistance to the plant protection product MENNO Florades 3837PR30330 N/N N 2765719/397672	J	MEN	Y

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KIIIA1 6	Meyer, J.	2013	Biological Assessment Dossier N/N N 2765720/397673	J	MEN	Y
KIIIA1 6.1.2	Büttner, C.	1900	Expert opinion on the virudical effect of the disinfectant FLORADES to disinfect Standing areas N/N N 2766082/397675	J	MEN	Y
KIIIA1 6.1.2	Büttner, C.	1998	Expert opinion on the effectiveness of MENNO Florades against orchid viruses (Odontoglossum ring spot Virus and Cymbidium mosaic Virus) N/N N 2766083/397676	J	MEN	Y
KIIIA1 6.1.2	Meiß, E.	1998	Expert evidence: Testing the virucidal activity of the disinfectant FLORADES N/N N 2766084/397677	J	MEN	Y
KIIIA1 6.1.3	Büttner, C.	2000	Expert opinion Effectivity of MENNO-Florades on viroids N/N N 2766085/397678	J	MEN	Y
KIIIA1 6.1.3	Büttner, C.	2000	Expert opinion, testing the disinfectant MENNO Florades here: the effectiveness against Pepino mosaic Virus (PepMV) N/N N 2766086/397679	J	MEN	Y

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KIIIA1 6.1.3	Büttner, C.	2000	Expert opinion effectivity of MENNO-Florades on viroids N/N N 2766087/397680	J	MEN	Y
KIIIA1 6.1.3	Büttner, C.	2001	Testing the disinfectant MENNO Florades effect on Zucchini yellow mosaic Virus (ZYMV), Melon necrotic spot Virus (MNSV), Pepper mild mottle Virus (PMMoV) and Bell pepper mottle Virus (BePMV) N/N N 2766088/397681	J	MEN	Y
KIIIA1 6.1.3	Büttner, C.	2004	Expert opinion on the virucidal effectivity of the product Menno-Florades on Asparagus under consideration of the Tobacco streak virus N/N N 2766089/397682	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W.	1995	Pre test for the sensibility of a rifamycin-resistant strain of Xanthomonas campestris pv. Pelargonii against MENNO-Florades V9509 N/N N 2766090/397683	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W.	2001	Results of effectiveness test of plant protection products for disinfection in plant production 2001 N/J N 2766091/397684	J	MEN	Y

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KIIIA1 6.1.3	Wohanka, W.	2002	Results of effectiveness test of plant protection products for disinfection in plant production 2002/Fusarium oxysporum (Strain from Elatiorbegonia) N/J N 2766095/397685	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W.	2002	Results of effectiveness test of plant protection products for disinfection in plant production 2002/Fusarium oxysporum f.sp. cyclaminis N/J N 2766096/397686	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Fehres, H.	1998	Bacterial and fungicidal effectiveness test of MENNO Florades against various phytopathogenic agents V9803 N/N N 2766099/397687	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Fehres, H.	1999	Fungicidal effectiveness test of MENNO Florades against various pathogens relevant for fungal culture (mushroom) V9916 N/J N 2766103/397688	J	MEN	Y
KIIIA1 6.1.3	Wohanka, W., Fehres, H.	2000	Bacterial and fungicidal effectiveness of MENNO Florades assayed in the Laboratory test V0010 N/J N 2766105/397689	J	MEN	Y

Annex Point	**Author**	**Year**	**Title** **Source** **Report-No.** **GLP/GEP** **Published** **Authority registration No./JKI-No.**	**Data protection claimed (J=Yes O=Open N=No)**	**Owner**	**How considered in dRR** Study-Status / Usage
KIIIA1 6.1.3	Wohanka, W., Fehres, H.	2000	Efficacy of the Disinfectants MENNO-Florades and MENNO Ter forte for the control of the new Erica fungus V0008 N/J N 2766107/397690	J	MEN	Y
KIIIA1 6.1.3	Harding, M.W., Howard, R.J.	2005	Evaluation of MENNO-Florades for Efficacy against Selected Bacterial, Fungal and Viral Pathogens of Greenhouse Vegetable Crops N/N N 2766108/397691	J	MEN	Y
KIIIA1 6.2.1	Büttner, C.	1998	Expert opinion on the effectiveness of MENNO Florades against orchid viruses (Odontoglossum ring spot Virus and Cymbidium mosaic Virus) N/N N 2766109/397692	J	MEN	Y
KIIIA1 6.2.1	Wohanka, W., Weishaupt, D., Klingebiel, S.	1996	MENNO Florades effectiveness against xanthomonas campestris pv. pelargonii for knive disinfection with a 2-minute exposure time V9604 N/N N 2766110/397693	J	MEN	Y
KIIIA1 6.2.1	Wohanka, W., Weishaupt, D., Klingebiel, S.	1995	Disinfecting activity test of Florades against cyclindrocladium spathiphylli in the practice test (surface and Immersion treatment) V9507 N/J N 2766111/397694	J	MEN	Y

Annex Point	**Author**	**Year**	**Title** **Source** **Report-No.** **GLP/GEP** **Published** **Authority registration No./JKI-No.**	**Data protection claimed (J=Yes O=Open N=No)**	**Owner**	**How considered in dRR** Study-Status / Usage
KIIIA1 6.2.1	Büttner, C.	2000	Expert opinion Effectivity of MENNO-Florades on viroids N/N N 2766112/397695	J	MEN	Y
KIIIA1 6.2.1	Büttner, C., Bandte, M.	2000	Elimination of plant viruses by horticultural disinfectant N/N N 2766113/397696	J	MEN	Y
KIIIA1 6.2.1	Kröcher, C.	2002	Fungal storage rots of potato/Bacterial wet rot on potatoes in storage rooms HR1F02MEN002 N/J N 2766115/397697	J	MEN	Y
KIIIA1 6.2.1	Zellner, M., Wagner, S., Weber, B., Beyer, F.	2004	Versuchsergebnisse aus Bayern- Gezielte Bekämpfung von Kartoffelkrankheiten(Blattfrüchte und Mais) N/J N 2766116/397698	J	MEN	Y
KIIIA1 6.2.1	Zellner, M., Wagner, S., Weber, B.	2002	Ergebnisse aus Feldversuchen-Versuchsjahr 2001 und 2002-Pflanzenschutz-Blattfrüchte und Mais, Krankheits- und Schädlingsbekämpfung N/J N 2766117/397699	J	MEN	Y

Annex Point	**Author**	**Year**	**Title** **Source** **Report-No.** **GLP/GEP** **Published** **Authority registration No./JKI-No.**	**Data protection claimed (J=Yes O=Open N=No)**	**Owner**	**How considered in dRR** Study-Status / Usage
KIIIA1 6.2.1	Zellner, M., Wagner, S., Weber, B.	2002	Ergebnisse aus Feldversuchen-Versuchsjahr 2001 und 2002-Pflanzenschutz-Blattfrüchte und Mais, Krankheits- und Schädlingsbekämpfung N/J N 2766118/397700	J	MEN	Y
KIIIA1 6.2.1	Zellner, M., Wagner, S., Weber, B., Beyer, F.	2005	Versuchsergebnisse aus Bayern-Gezielte Bekämpfung von Kartoffelkrankheiten(Blattfrüchte und Mais) N/J N 2766119/397701	J	MEN	Y
KIIIA1 6.2.1	Bos, D., Veerman, A.	2005	Efficacy Evaluation of Menno Florades as a fungicide against silver scurf in seed potato storage 510394 N/J N 2766120/397702	J	MEN	Y
KIIIA1 6.2.1	Wölk, M.	1996	Expert Opinion on the disinfectant Florades (Menno Chemie) and its practical application in horticulture. MEN-07-04 N/N N 2766121/397703	J	MEN	Y
KIIIA1 6.2.1	Billenkamp, N.	2001	Report on the disinfection of trays used for tobacco plant seedlings with M&ENNO® TER forte and MENNO Florades® MEN-07-49 N/J N 2766122/397704	J	MEN	Y

Annex Point	**Author**	**Year**	**Title** **Source** **Report-No.** **GLP/GEP** **Published** **Authority registration No./JKI-No.**	**Data protection claimed (J=Yes O=Open N=No)**	**Owner**	**How considered in dRR** Study-Status / Usage
KIIIA1 6.2.1	Anonymous	1999	Bekämpfung der Blatt- und Stengelbakteriose (Xanthomonas campestris pv. Begoniae) an Begonien 1999 MEN-07-59 N/N N 2766126/397705	J	MEN	Y
KIIIA1 6.2.1	Wohanka, W.	2004	Einsatz von MENNO-Florades im Spritzverfahren zur Bekämpfung von Bakteriosen an Pelargonien und Elatiorbegonien MEN-07-60 N/J N 2766128/397706	J	MEN	Y
KIIIA1 6.2.3	Harding, M.W., Howard, R.J.	2005	Evaluation of MENNO-Florades for Efficacy against Selected Bacterial, Fungal and Viral Pathogens of Greenhouse Vegetable Crops N/N N 2766130/397707	J	MEN	Y
KIIIA1 11.5	Anonymus	2014	MENNO Florades - Vorläufige Gebrauchsanleitung Version DHD-07-2014 DE			

Appendix 2.1: GAP table EU Member States

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance 1	**-**	**Conc. of as 1:**	**-**
active substance 2	**-**	**Conc. of as 2:**	**-**
active substance	**Benzoic acid**	**Conc. of as:**	**90 g/L**
safener	**no**	**Conc. of safener:**	**n.a.**
synergist	**no**	**Conc. of synergist:**	**n.a.**
Applicant:	**MENNO Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**Northern + Central + Southern/EU**	**non professional use**	☐

Verified by MS: northern/central/southern

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
1	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Bacterial harmful organisms, Fungal harmful organisms	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
2	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Bacterial harmful organisms, Fungal harmful organisms	watering	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
3	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Bacterial harmful organisms, Fungal harmful organisms	flooding	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation (crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks: Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications) a) per use b) per crop/ season**	**L product / ha a) max. rate per appl. b) max. total rate per crop/season**	**g as/ha a) max. rate per appl. b) max. total rate per crop/season**	**Water L/ha min / max**		
4	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Viruses and viroids	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
5	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Viruses and viroids	watering	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
6	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces		Viruses and viroids	flooding	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
7	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Bacterial harmful organisms, fungal harmful organisms, Viruses and Viroids	Dipping	n.a.	a) 1 b) not relevant	not relevant	not relevant	not relevant	not relevant	4 % - 3 min. No direct treatment of plants, soil or substrates. Only for disinfection.

n.a. = not applicable

Remarks:

(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
(d) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) GCPF Codes - GIFAP Technical Monograph No 2, 1989
(f) All abbreviations used must be explained
(g) Method, e.g. high volume Coarse Spraying, low volume Coarse Spraying, spreading, dusting, drench
(h) Kind, e.g. overall, broadcast, aerial Coarse Spraying, row, individual plant, between the plants - type of equipment used must be indicated
(i) g/kg or g/l
(j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(k) The minimum and maximum number of application possible under practical conditions of use must be provided
(l) PHI - minimum pre-harvest interval
(m) Remarks may include: Extent of use/economic importance/restrictions

Appendix 2.2: GAP table Germany

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**	**(days)**	**e.g. safener/synergist per ha**
Zierpflanzenbaukulturen												
1	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Bakterielle und pilzliche Schaderreger	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
2	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Bakterielle und pilzliche Schaderreger	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
3	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Bakterielle und pilzliche Schaderreger	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation (crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications) a) per use b) per crop/ season**	**L product / ha a) max. rate per appl. b) max. total rate per crop/season**	**g as/ha a) max. rate per appl. b) max. total rate per crop/season**	**Water L/ha min / max**	**(days)**	**e.g. safener/synergist per ha**
4	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Viren und Viroide	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
5	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Viren und Viroide	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
6	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Viren und Viroide	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
7	DE	**Zierpflanzenbaukulturen** Gewächshäuser, Räume: Schnittwerkzeuge	G, I	Bakterielle und pilzliche Schaderreger, Viren und Viroide	Tauchen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) nicht zutreffend	a) nicht zutreffend	a) nicht zutreffend	Nicht relevant	4 % - Einwirkungsdauer 3 min Keine direkte Behandlung der Pflanzen, keine direkte Behandlung des Pflanzenerzeugnisses, Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**	**(days)**	**e.g. safener/synergist per ha**
Gemüsebaukulturen												
8	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Bakterielle und pilzliche Schaderreger	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
9	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Bakterielle und pilzliche Schaderreger	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
10	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Bakterielle und pilzliche Schaderreger	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/or situation (crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications) a) per use b) per crop/ season**	**L product / ha a) max. rate per appl. b) max. total rate per crop/season**	**g as/ha a) max. rate per appl. b) max. total rate per crop/season**	**Water L/ha min / max**	**(days)**	**e.g. safener/synergist per ha**
11	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Viren und Viroide	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
12	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Viren und Viroide	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
13	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Viren und Viroide	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
14	DE	**Gemüsebaukulturen** Gewächshäuser, Räume: Schnittwerkzeuge	G, I	Bakterielle und pilzliche Schaderreger, Viren und Viroide	Tauchen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) nicht zutreffend	a) nicht zutreffend	a) nicht zutreffend	Nicht relevant	4 % - Einwirkungsdauer 3 min Keine direkte Behandlung der Pflanzen, keine direkte Behandlung des Pflanzenerzeugnisses, Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**	**(days)**	**e.g. safener/synergist per ha**
Kartoffeln												
15	DE	**Kartoffeln** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Bakterielle und pilzliche Schaderreger	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
16	DE	**Kartoffeln** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Bakterielle und pilzliche Schaderreger	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
17	DE	**Kartoffeln** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Bakterielle und pilzliche Schaderreger	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**	**(days)**	**e.g. safener/synergist per ha**
18	DE	**Kartoffeln** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Viren und Viroide	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
19	DE	**Kartoffeln** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Viren und Viroide	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
20	DE	**Kartoffeln** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Viren und Viroide	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
21	DE	**Kartoffeln** **(Vermehrungsgut)** Gewächshäuser, Räume: Schnittwerkzeuge	G, I	Bakterielle und pilzliche Schaderreger, Viren und Viroide	Tauchen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) nicht zutreffend	a) nicht zutreffend	a) nicht zutreffend	Nicht relevant	4 % - Einwirkungsdauer 3 min Keine direkte Behandlung der Pflanzen, keine direkte Behandlung des Pflanzenerzeugnisses, Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation (crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications) a) per use b) per crop/ season**	**L product / ha a) max. rate per appl. b) max. total rate per crop/season**	**g as/ha a) max. rate per appl. b) max. total rate per crop/season**	**Water L/ha min / max**	**(days)**	**e.g. safener/synergist per ha**
Tabak												
22	DE	**Tabak** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Bakterielle und pilzliche Schaderreger	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
23	DE	**Tabak** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Bakterielle und pilzliche Schaderreger	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung)	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
24	DE	**Tabak** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Bakterielle und pilzliche Schaderreger	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 ODER 160	a) 7200 ODER 14400	a) 8000	Nicht relevant	1%, Einwirkungsdauer: max. 16h ODER 2%, Einwirkungsdauer: max. 4h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (add.: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI**	**Remarks:**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**	**(days)**	**e.g. safener/synergist per ha**
25	DE	**Tabak** Gewächshäuser, Räume: Oberflächen von Stellflächen, Wänden, Maschinen, Gerätschaften, Containern und Gefäßen	G, I	Viren und Viroide	Spritzen oder schäumen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
26	DE	**Tabak** Gewächshäuser, Räume: Stellflächen und Gefäße	G, I	Viren und Viroide	Gießen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
27	DE	**Tabak** Gewächshäuser, Räume: versiegelte plane, nicht profilierte Stellflächen	G, I	Viren und Viroide	Fluten	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) 80 BIS 320	a) 7200 BIS 28800	a) 8000	Nicht relevant	1 %, 2 % bzw. 4 % bei leicht, mittelschwer und schwer zu inaktivierenden Schadorganismen Einwirkungsdauer: max. 16 h Keine direkte Behandlung von Pflanzen, Substraten oder Erden. Anwendung zur Desinfektion
28	DE	**Tabak** Gewächshäuser, Räume: Schnittwerkzeuge	G, I	Bakterielle und pilzliche Schaderreger, Viren und Viroide	Tauchen	Nach der letzten Nutzung oder vor jeder Wiederverwendung und nach gründlicher mechanischer Reinigung	a) 1 b) nicht zutreffend / nicht relevant	a) nicht zutreffend	a) nicht zutreffend	a) nicht zutreffend	Nicht relevant	4 % - Einwirkungsdauer 3 min Keine direkte Behandlung der Pflanzen, keine direkte Behandlung des Pflanzenerzeugnisses, Anwendung zur Desinfektion

Appendix 2.3: GAP-Table of zRMS (green box)

GAP-Table of zRMS

GAP-Table of intended uses for Germany

GAP rev. (4), date: 2015-08-12

PPP (product name/code) **MENNO Florades** **Formulation type:** **SL**
active substance **benzoic acid** **Conc. of as :** **90.00 g/L**

Applicant: **Menno-Chemie-Vertrieb GmbH** **professional use** ☒
Zone(s):central EU **non professional use** ☐

Verified by MS: yes

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation (crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**			**Application rate**			**PHI** (days)	**Remarks:**
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product/ha spray volume L/m², exposure time/ concentration	g as/ha g as/m²	Water L/ha min / max		e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
001	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 %	7200 or 14400 g as/ha 1%:			The exposure time is specific to the pathogen and can be reduced, if necessary. *surfaces of standing areas, vessels, walls,

					plants			exposure time 4 hours: 2%	0.72 g as/m² 2%: 1.44 g as/m²			machinery and equipment etc. - for disinfection -
002	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *standing areas and vessels - for disinfection -
003	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
004	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

								organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²			
005	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
006	DE	ornamentals NNNZZ	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m²	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for

								exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			disinfection -
007	DE	ornamentals NNNZZ	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -
008	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
009	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m²	7200 or 14400 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary.

								exposure time 16 hours: 1 % exposure time 4 hours: 2%	1%: 0.72 g as/m² 2%: 1.44 g as/m²			* standing areas and vessels - for disinfection -
010	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
011	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -

012	DE	vegetables NNNVV	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
013	DE	vegetables NNNVV	G* I*	viruses BXXXXX** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -

								medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	2%: 1.44 g as/m² 4%: 2.88 g as/m²				
014	DE	vegetables NNNVV	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -	
015	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -	
016	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -	
017	DE	potato SOLTU	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the	after the last use or before each reuse and after	1	80 or 160 L/ha spray volume:	7200 or 14400 g as/ha			The exposure time is specific to the pathogen and can be reduced, if	

					plants	thorough mechanical cleaning		0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	1%: 0.72 g as/m² 2%: 1.44 g as/m²			necessary. *sealed, plane, non profiled standing areas - for disinfection -
018	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	spraying or foaming no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
019	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours	7200 or 14400 or 28800 g as/ha			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								- harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			
020	DE	potato SOLTU	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
021	DE	potato SOLTU	G*	bacterial and fungal	dipping,	after the last use	1	exposure time	not applica-			*cutting tools - for disin-

		(reproductive material)	I*	harmful organisms FBPXXX** viruses BXXXXX ** viroids BXVXXX**	no direct treatment of the plants	or before each reuse and after thorough mechanical cleaning		3 minutes: 4 %	ble			fection -
022	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	spraying or foaming, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
023	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -
024	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 L/ha spray volume: 0.8 L/m² exposure time 16 hours: 1 % exposure time 4 hours: 2%	7200 or 14400 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
025	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	spraying or foam-	after the last use or before each	1	80 or 160 or 320 L/ha	7200 or 14400 or			The exposure time is specific to the pathogen

					ing, no direct treatment of the plants	reuse and after thorough mechanical cleaning		spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			and can be reduced, if necessary. * surfaces of standing areas, vessels, walls, machinery and equipment etc. - for disinfection -
026	DE	tobacco NIOTA	G* I*	viruses BXXXXX** viroids BXVXXX**	watering, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inacti-	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%:			The exposure time is specific to the pathogen and can be reduced, if necessary. * standing areas and vessels - for disinfection -

								vate: 2 % - harmful organisms difficult to inactivate: 4 %	1.44 g as/m² 4%: 2.88 g as/m²			
027	DE	tobacco NIOTA	G* I*	viruses BXXXXX ** viroids BXVXXX**	flooding, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	80 or 160 or 320 L/ha spray volume: 0.8 L/m² exposure time 16 hours - harmful organisms easy to inactivate: 1 % - harmful organisms medium difficult to inactivate: 2 % - harmful organisms difficult to inactivate: 4 %	7200 or 14400 or 28800 g as/ha 1%: 0.72 g as/m² 2%: 1.44 g as/m² 4%: 2.88 g as/m²			The exposure time is specific to the pathogen and can be reduced, if necessary. *sealed, plane, non profiled standing areas - for disinfection -
028	DE	tobacco NIOTA	G* I*	bacterial and fungal harmful organisms FBPXXX** viruses BXXXXX** viroids BXVXXX**	dipping, no direct treatment of the plants	after the last use or before each reuse and after thorough mechanical cleaning	1	exposure time 3 minutes: 4 %	not applicable			*cutting tools - for disinfection -

** no EPPO-Code

Remarks:
(1) Numeration of uses in accordance with the application/as verified by MS
(2) Member State(s) or zone for which use is applied for
(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided
(8) Min. interval between applications (days) were relevant
(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)
(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)
(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.

Appendix 2.4: GAP-Table of intended uses for all cMS (without Germany) not verified by ZRMS (green box)

GAP- table of intended uses for all cMS (without Germany) not verified by ZRMS

PPP (product name/code)	**MENNO Florades**	**Formulation type:**	**SL**
active substance 1	**-**	**Conc. of as 1:**	**-**
active substance 2	**-**	**Conc. of as 2:**	**-**
active substance	**Benzoic acid**	**Conc. of as:**	**90 g/L**
safener	**no**	**Conc. of safener:**	**n.a.**
synergist	**no**	**Conc. of synergist:**	**n.a.**
Applicant:	**MENNO Chemie-Vertrieb GmbH**	**professional use**	☒
Zone(s):	**Northern + Central + Southern/EU**	**non professional use**	☐

Verified by MS: no

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)**	**Application**			**Application rate**			**PHI (days)**	**Remarks:** **Disinfection concentration (time)**
					Method / Kind	**Timing / Growth stage of crop & season**	**Max. number (min. interval between applications)** **a) per use** **b) per crop/ season**	**L product / ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**g as/ha** **a) max. rate per appl.** **b) max. total rate per crop/season**	**Water L/ha** **min / max**		
1	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container	G, I	Bacterial harmful organisms, Fungal harmful organisms	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates.

		and vessels										Only for disinfection.
2	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and container	G, I	Bacterial harmful organisms, Fungal harmful organisms	watering	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
3	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces	G, I	Bacterial harmful organisms, Fungal harmful organisms	flooding	n.a.	a) 1 b) not relevant	a) 80 OR 160	a) 7200 OR 14400	a) 8000	not relevant	1%: max. 16h OR 2%: max. 4h No direct treatment of plants, soil or substrates. Only for disinfection.
4	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Surfaces of tables, benches, trays, walls, machines, container and vessels	G, I	Viruses and viroids	Directed coarse spray or foaming (lathering)	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
5	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Hard surfaces and	G, I	Viruses and viroids	watering	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of

		container										the pest No direct treatment of plants, soil or substrates. Only for disinfection.
6	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Sealed, plain, and non-profiled hard surfaces		Viruses and viroids	flooding	n.a.	a) 1 b) not relevant	a) 80 - 320	a) 7200 - 28800	a) 8000	not relevant	1 %, 2 % or. 4 %, max. 16 h depending on the difficulties of inactivation of the pest No direct treatment of plants, soil or substrates. Only for disinfection.
7	EU	Rooms, buildings or greenhouses in agriculture and horticulture: Small tools (e.g. knifes, secateurs)	G, I	Bacterial harmful organisms, fungal harmful organisms, Viruses and Viroids	Dipping	n.a.	a) 1 b) not relevant	not relevant	not relevant	not relevant	not relevant	4 % - 3 min. No direct treatment of plants, soil or substrates. Only for disinfection.

n.a. = not applicable

Remarks:
(1) Numeration of uses in accordance with the application/as verified by MS
(2) Member State(s) or zone for which use is applied for
(3) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(4) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(5) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds, developmental stages
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage of treatment(s) (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(8) The maximum number of applications possible under practical conditions of use for each single application and per year (permanent crops) or crop (annual crops) must be provided
(8) Min. interval between applications (days) were relevant
(10) The application rate of the product a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. kg or L product / ha)
(11) The application rate of the active substance a) max. rate per appl. and b) max. total rate per crop/season must be given in metric units (e.g. g or kg / ha)
(12) The range (min/max) of water volume under practical conditions of use must be given (L/ha)
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions/minor use etc.