Fact Sheet

on reducing the contamination of certain feed with seeds of

Ambrosia artemisiifolia L.

(as of 17.03.2008)
Fact Sheet on reducing the contamination of certain feed with seeds of *Ambrosia artemisiifolia L.*

This fact sheet shows feed producers ways to identify potential sources of introduction of *Ambrosia artemisiifolia L.* seeds into the production process of certain feed, to contribute through appropriate measures to minimising the release of ambrosia seeds into the environment via the feed chain, and thus to contain one of the sources of spread of this highly allergenic plant.

I. **Occurrence and distribution of Ambrosia artemisiifolia L.**

*Ambrosia artemisiifolia L.* (synonyms: Annual Ragweed, Bitterweed, Blackweed, Carrot Weed, Hay Fever Weed, Roman Wormwood, Stammerwort, Stickweed, Tassel Weed, Wild Tansy and American Wormwood), hereinafter referred to as Common Ragweed, is an annual ruderal plant which grows easily in the wild. It is native to North America and was brought to Europe in the 19th century together with cereals and possibly also clover.

There are already large populations of this plant in some European countries, particularly in Hungary and Croatia and in some parts of Italy, Austria, Switzerland and France. In Poland, Lithuania and Germany, it has occurred only rarely so far and most of the time it has not survived. Since the beginning of the 1990s, however, Common Ragweed has
also spread increasingly in Germany. Common Ragweed prefers open spaces and grows e.g. along roadsides, field margins and waysides, and on building sites, storage areas and dumps. Common Ragweed is also found beneath bird feeding places and in the periphery of oil mills. Some larger Ragweed populations (more than 100 plants) have so far been noticed in Bavaria, Baden-Württemberg, the southern part of Hesse, the southeastern part of Rhineland-Palatinate, Brandenburg and Berlin.

II. Relevance of *Ambrosia artemisiifolia* L. to human and animal health and its impact on agriculture

The pollen of Common Ragweed may cause severe allergies in humans. Manifestations of the allergy are manifold, ranging from rhinitis to conjunctivitis and asthma. The occurrence of contact dermatitis has also been reported. The allergenicity of Common Ragweed is estimated to be higher than that of grasses. Sensitive people can already show allergic reactions at a concentration of 6 pollen grains per cubic metre of air. If the concentration is higher than 11 pollen grains per cubic metre, this is considered to be a high level of exposure. In contrast, in the case of grass pollen, a concentration of more than 50 pollen grains per cubic metre of air is considered to be a high level of exposure. Due to the late flowering period of Common Ragweed from mid-July until the end of October (in some cases also until the end of November if the weather is mild), the allergy period is extended by about two months.

According to current knowledge, Common Ragweed seeds in feed do not pose a direct risk to animal health.
In some countries (United States, Hungary, France), Common Ragweed is causing weed problems in **agriculture**. In these countries, Common Ragweed is primarily known to reduce yields in the cultivation of maize, wheat, sunflowers, millet, peanuts, soy, beans and potatoes. In addition to this, the resistance of Common Ragweed to herbicides and the germination capacity of its seeds of more than 30 years make it difficult to control this weed. Common Ragweed also plays a role as a secondary host for organisms which are harmful to cultivated plants (e.g. for fungal pathogens harmful to sunflowers). The yield-reducing effect of Common Ragweed is not yet significant in the Federal Republic of Germany.

### III. *Ambrosia artemisiifolia L.: Potential entry routes and means of spreading – presence in feed*

The following means by which Common Ragweed (seeds) may enter an area or spread are currently known or under discussion. It may:

- carry over during transportation of harvested products (seeds, feed grains), in particular from south-eastern Europe, Hungary, Italy or France,
- carry over during transportation or rearrangement of soil material contaminated with Ragweed seeds,
- spread along roadsides on the wind caused by passing vehicles,
- drift in rivers,
- spread via imports of untreated or uncleaned seeds and straight feedingstuffs (in particular feed grains),
- the use of straight feedingstuffs contaminated with Common Ragweed seeds, in particular in the preparation of scatter feed for the winterfeeding of wild birds,
- spread via the wild birds themselves,
- spread via garden waste and compost,
- spread via the use of bird feed (in particular sunflower seeds) as seeds e.g. for pick-your-own flower fields, biogas production, landscape beautification, green manuring, game feeding, and
- spread via the supply of scourings (in particular from sunflower seeds and millet) for game feeding.
Of the means of entry or spread of Ragweed seeds listed above, bird feed, in particular for feeding wild birds, is considered to be of particular significance.

In 2006 and 2007, Ragweed seeds were found in various feed materials and compound feedingstuffs during non-representative internal checks by feed producers and checks by the feed inspection authorities of the Federal States (Bundesländer). Samples were primarily taken from unchanged, untreated or unprocessed feed materials (feed grains), as it is assumed that treatment or processing operations (e.g. heating, extraction, grinding) inactivate or destroy Ragweed seeds and thus also their germination capacity.

The results of the 319 samples of different feed materials and compound feedingstuffs that were tested are presented in the following diagram.

These tests showed that Ragweed seeds were found in both small-grained and large-grained feed materials.

Significant contamination of feed materials and primary products (more than 50 Ragweed seeds/kg feedingstuff) was found in samples of sunflower seeds and millet. It was to be expected that pre-cleaned batches were usually less contaminated with Ragweed seeds than uncleaned batches.
If we take the intervention level of 0.02 % (0.2 g/kg feedingstuff) which was used in Switzerland\(^1\) until April 2007 to assess positive test results and a calculated average Ragweed seed weight of 0.0056 g as a basis, 16 % of the feedingstuffs with positive test results were contaminated by more than 0.02 %.

Since small-grained and large-grained seeds, in particular whole seeds, are used as main ingredients of bird feed and winter scatter feed, it must be assumed that these feedingstuffs have, all in all, a higher degree of contamination with Ragweed seeds, as the respective feed materials might already have been contaminated. This assumption is also supported by the findings in winter scatter feed and complementary feedingstuffs for wild birds which were tested for Ragweed seeds, with contamination levels of up to 629 Ragweed seeds/kg feedingstuff being detected in the respective feedingstuffs.

According to the findings which are available so far, it is estimated that contamination with Ragweed seeds must in particular be expected if the feed materials (feed grains and seeds) originate from Eastern Europe, Hungary, France, Italy and Austria.

**IV. Identification and determination of Ragweed seeds in feedingstuffs**

The fruits (achenes) of Common Ragweed contain one seed each. The diaspores are approx. 3 mm in size and have a very striking appearance due to their characteristic jagged crown.

\(^1\) Since May 2007, the intervention value for *Ambrosia Artemisiifolia* L. in feedingstuffs for wild birds has been 0.005% in Switzerland (this is equal to approx. 10 Ragweed seeds/kg feedingstuff).
To determine the contamination level of a feed sample with *Ambrosia artemisiifolia* L. diasporos in a laboratory, at least 500 g of a representative sample should be sieved through two punched sieves or wire mash sieves, the upper sieve having a mesh sizes of 4 mm and the lower a mesh size of 2 mm, thereby separating the sample into three parts depending on particle size. The diaspores and their fragments are identified by their morphological characteristics, if necessary with the help of material for comparison and a magnifying glass, and removed from the respective parts of the sample. The majority of the whole, unbroken diaspores will be in the part of the sample caught by the lower sieve.

To quantify the number of diaspores in the feedingstuff, the whole, unbroken diaspores which have been removed are counted and the corresponding level for 1 kg of the feed sample calculated. To determine the concentration of diaspores, the diaspores which have been removed must be weighed and the percentage share per kg of the feedingstuff calculated.

![Ragweed seeds in bird feed (b)](image)

The International Association of Feedingstuff Analysis (IAG) - Section on Feedingstuff Microscopy – is currently developing an *IAG Method for the Determination of Ambrosia (Ambrosia artemisiifolia L.) in non-pelleted Animal Feedingstuffs.*
V. **Recommendations and measures to reduce the contamination of feedingstuffs with Ragweed seeds or the release of Ragweed seeds into the environment**

In Switzerland, Ragweed seed contents in winter scatter feed for wild birds have been significantly reduced over a period of 3 years thanks to several steps (application of an intervention level of 0.02 % Ragweed seeds in feedingstuffs from April 2006 to April 2007; application of an intervention level of 0.005 % Ragweed seeds in feedingstuffs for wild birds since April 2007).

These results were in particular achieved through:

⇒ **cleaning of large-grained seeds,**

⇒ **non-use of small-grained seeds in winter scatter feed for wild birds,** or

⇒ **use of seeds from contract growing with special monitoring and control measures.**

In a **first step**, we therefore recommend that feed producers should take a Ragweed seed content of 0.02 % (approx. 35 seeds/kg) in feed materials which are in particular used for the production of winter scatter feed for wild birds as a benchmark for the implementation of additional mechanical cleaning measures (e.g. sieving) for the contaminated feedingstuffs.

To contain one of the ways in which Ragweed seeds may spread, namely via **winter scatter feed**, only feed materials (feed grains) which have been cleaned should be used for the production of these feeds. If the benchmark of 0.02 % of Ragweed seeds in feedingstuffs is complied with, a notice such as “cleaned” or “checked” may be added to the feedingstuff.

Using mechanical methods (sieving), Ragweed seeds can, due to their structure and size, only be successfully removed from large-grained seeds, such as e.g. sunflower seeds, according to current knowledge.

**Scourings** of feed grains should be disposed of safely. When transporting scourings which contain Ragweed seeds, measures should be taken to minimise or prevent a possible spread of the seeds. In particular when disposing of the scourings by way of composting, it should be ensured that they are fed into composting processes which involve hot composting with complete sanitisation or that they are broken up (e.g. by appropriate grinding techniques) before entering the composting process in order to destroy the germination capacity of the Ragweed seeds. According to current knowledge, it can be expected that composting in accordance with the temperature and time requirements of the Ordinance on
Biowastes\(^2\) concerning treatment for sanitisation will destroy Ragweed seeds. Scourings of feed grains should not be supplied as feed for wild animals.

**Imported** feed materials, in particular feed grains or grain seeds, should be pre-cleaned.

We recommend that feed producers should test predisposed untreated feed materials (e.g. feed grains, sunflower seeds, millet or milo) for contamination with Ragweed seeds by means of regular **inspections of the incoming goods** carried out as part of their HACCP concept.

Feed producers are asked to make their findings regarding the contamination level of feedingstuffs with Ragweed seeds, which they obtained through their own inspections, available to the Federal Office of Consumer Protection and Food Safety (BVL) by e-mail (ambrosia@bvl.bund.de), so that the data base on the presence of Ragweed seeds in feed materials can be expanded.

**Feed merchants** should check with their suppliers that the feed producers have taken measures to reduce the contamination of winter scatter feed for wild birds with Ragweed seeds.

The recommendations contained in this Fact Sheet will be evaluated in 2009 with a view to updating them if necessary.

In a **second step**, will be recommended that feed producers should aim at a Ragweed seed content of less than 0.005 % (approx. 10 seeds/kg) in the production of winter scatter feed for wild birds. This can, in particular, be achieved by not using small-grained seeds from contaminated regions or by using seeds from contract growing with special monitoring and control measures.

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Literature

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Fact Sheet in cooperation with

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