

Ambrosia artemisiifolia seeds in bird feed

Four years of work done by the European feed microscopists of the IAG working group



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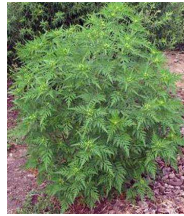
Ambrosia artemisiifolia is an invasive plant with highly allergenic pollen and important seed production. Its spread throughout different European countries has been thought to be linked with the presence of seeds in bird feed and the germination of seedlings at the foot of the trough. Other propagation ways are movements of soil and vehicles together with contaminated seed lots.



Ambrosia fruit (seed)



Ambrosia seedling



Ambrosia plant



Ambrosia inflorescences



Flowering Ambrosia plant



Ambrosia with ripe pollen



Ambrosia pollen grain

Number of Ambrosia seeds / kg					
Year					
2005	2006	2007	2008	2009*	100*
367	303	220	220	220	100
133	73	109	34	0	0
97	19	99	14	0	0
79	11	22	13	0	0
78	7	29	7	0	0
62	5	7	3	0	0
18	3	7	3	0	0
15	3	6	2	0	0
2	1	4	2	0	0
2	1	2	2	0	0
0	0	0	0	0	0
0	0	1	0	-	-
0	0	0	0	-	-
0	0	0	0	-	-
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0	0	0	0	-	-
0	0	0	0	-	-
0	0	0	0	-	-

Ambrosia negative
Ambrosia positive below intervention limit
Ambrosia positive above intervention limit
Raw material *1/2 year

In 2005, the **Swiss official feed inspection** was mandated to check bird feed and **raw materials** for the presence of *Ambrosia* seeds. Indeed, such seeds were found in varying amounts when analysed in the feed microscopy laboratory. The producers were informed, and a **limit of intervention (50 mg/kg ≈ 9 seeds / kg)** was finally set for this undesirable component. The results of five years of controls show, at first, **around 50 % of contaminated samples**. With convenient measures (and cooperation of the feed industry), the level of contamination could be lowered.

Several EU member states started their own control programs. The results of studies from **Germany** (CVUA and LLBB), **Slovenia** (VF (SLO)) and **Denmark** (DPD), presented by their feed microscopists at the IAG meetings, indicate the presence of *Ambrosia* seeds in **21 to 75 %** of the products put on the market.



Ambrosia seeds (circled) in bird feed

Number of Ambrosia seeds / kg							
Year							
CVUA	VF(SLO)	DPD	LLBB*	2008	2009	2008	2009
61	470	56	176	640	1040	160	
24	392	42	140	110	80	80	
15	336	36	120	61	40	40	
15	292	20	63	60	0	0	
12	154	6	12	49	0	0	
12	144	6	7	37	0	0	
5	126	4	7	32	0	0	
4	124	4	7	24	0	0	
2	110	0	0	15	0	0	
2	4	0	0	14	0	0	
2	2	0	0	10	0	0	
1	2	0	0	4	0	0	
0	0	0	0	2	0	0	
0	0	0	0	1	0	0	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
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0	0	0	0	0	0	0	
0	0	0	0	0	0	0	

Ambrosia negative
Ambrosia positive below intervention limit
Ambrosia positive above intervention limit
Raw material *Analysis done on 25 g

The IAG feed microscopy working group, as a network for exchanging information and reference material, together with developing and standardising methods, **started writing a protocol for the detection and quantification of *Ambrosia* in bird feed**: at ALP, the sieves to be used were checked.

- A large proportion of seeds were smaller than 2.5 mm in 2005
- The number of seeds < 2.5 mm was reduced in 2006 and 2007
- **The size of the seeds found in feed may vary according to the source of contamination and the treatment (sieving?) applied by the feed producer.**
- Seeds are seldom larger ("wider") than 3.5 mm or smaller than 1.5 mm

Sample	Subs.	% w/w	Seeds/kg	Sieves used
1	1	0.006	6	yes
1	2	0.003	4	yes
1	3	0.002	2	?
1	4	0	0	?
1	5	0.005	6	yes
1	6	0.005	6	yes
1	7	0.003	4	yes
1	Org.*	0.003	4	yes
Mean		0.003	4	
2	1	0.1	157	yes
2	2	0.12	175	yes
2	3	0.11	173	no
2	4	0.12	178	yes
2	5	0.14	198	no
2	6	0.15	220	no
2	7	0.15	223	yes
2	8	0.17	248	yes
2	Org.*	0.14	220	yes
Mean		0.13	199	

*Organiser

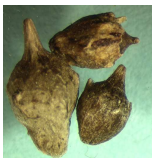
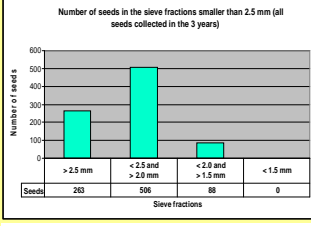
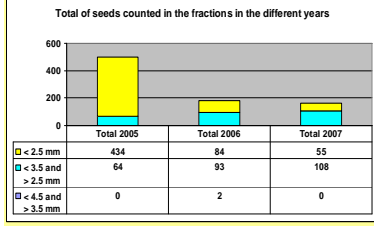
A ring test (2 samples analysed at ALP showing distinct contamination levels) was performed in 2008 to test the method and train the analysts.
Method suggested by the IAG:

- Weight of analysed sub-sample ≥ 500g,
- Sieving (1.5 mm; 4 mm),
- Observation of the fraction > 1.5 mm and < 4 mm with the stereomicroscope,
- Counting and weighting the found *Ambrosia* seeds.

➤ For contamination level near the value of intervention, analysing more or larger sub-samples could be necessary. Weighing or counting can make a difference.

➤ No problem implementing the method because of the specific features of the seed, but sampling has an impact on the results.

➤ Using sieves and stereomicroscope is recommended.



Ambrosia seeds of different sizes

Size comparison between Ambrosia and Sunflower seeds



IAG- methods:
www.iag-micro.org