Experiences with Ambrosia Control in Switzerland

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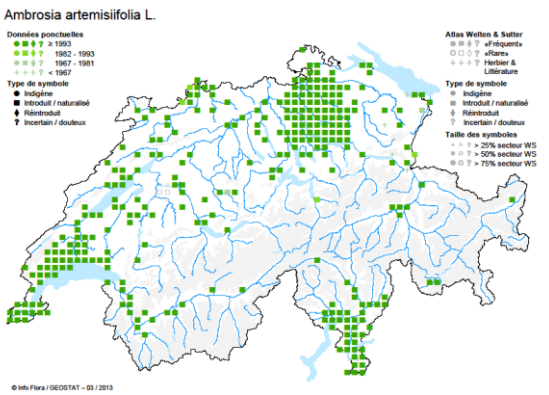
Since ~1860 in Switzerland

Common ragweed (*Ambrosia artemisiifolia*) is an annual shrub of North American origin. It has been present in Switzerland since ~1860 arriving probably through polluted clover seed grains, hay and straw from North America. Highly infested regions in Europe are the French Rhone valley, the Italian Po valley and some former Yugoslavian states, as well as Hungary and Austria.

Maximal distribution in the country

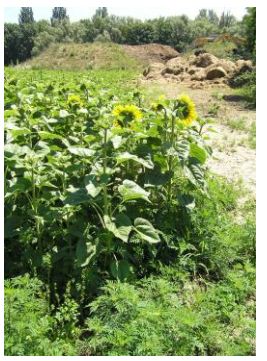


Ways of entrance

Ragweed seeds were found in the bird seed mixtures sold in supermarkets in Switzerland. Thus, it is not amazing to find ragweed in many private house gardens, or in recreational areas in towns. Seeds are also found in imported sunflower and sorghum. In most cases it is technically impossible to separate the ragweed grains. Therefore, grain importers and feed producers should be aware of the problem.

Control in agriculture

Control with herbicides is difficult in some crops like sugar beet and peas, and is nearly impossible with sunflowers because ragweed and sunflower belong to the same botanical family.
From 2003 to 2009 Agroscope has been performing efficacy trials with many herbicides registered in Switzerland on the efficacy of the herbicides against ragweed. Knowledge about mechanical control of ragweed could be very important for road services, as the use of herbicides along roads is highly restricted. From 2004 to 2007, we have been monitoring mowing trials where we count the seed production of ragweed after a series of various dates of cutting. Our first observations showed that a cut in the first half of September can stop the seed production, but cannot prevent the production of pollen. It may be very difficult to inhibit coevally pollen production and seed production.
In sunflowers no efficient herbicides were found. A ragweed, germinated in cereals, rest in a small stage until the crop is harvested; coming to the light, it starts to reproduce. The flowering time is obviously day length dependant and is similar for all plants: it starts from end of July. Insufficient mechanical or chemical control allows ragweed to sprout quickly from the base of the stem.



Ambrosia artemisiifolia

Medical aspects

Common Ragweed produces pollen in large quantities from August to September and it is often transported by wind over far distances. Concentrations between 6 and 10 pollen grains per m^3 air already mean a moderate load and more than 10 pollens per m^3 a high load. By comparison grass pollen, which is the main allergen for hay fever in Switzerland, reaches a high load at more than 49 pollen per m^3.
The airborne pollens are collected with an volumetric pollen trap and analysed by light microscopy. In 1969 R.M. Leuschner initiated the pollen measurement in Switzerland with the first pollen trap in Basel. Since 1993 MeteoSwiss runs the national pollen monitoring network with 14 measuring stations. The Ambrosia pollen counts increased in the region of Geneva in the eighties and nineties. The highest levels of Ambrosia pollen in Switzerland are measured in Ticino.
Experiences from France and North America show that around 10 % of the population is sensitive to ambrosia pollen. A quarter of them may develop heavy asthmatic reactions. So far, two third of Swiss patients were sensitised outside of Switzerland. In the St.Gall Rhine valley in eastern Switzerland 10 % of 15 year old students showed sensitivity to pollen of ragweed.

Since 2006: Obligation to ANNOUNCE foci and to CONTROL is fixed in the Ordinance of Plant Protection SR 916.20

To date the Cantonal Plant Protection Services are responsible for the ragweed control. They are in close personal contact with concerned farmers. Bird seed and pet food producers are aware of the problem.
Ragweed is not eradicated but importantly reduced.
See figures below.

Pollution of bird- and small animal feed with ragweed seeds 2005 – 2013 (Results of official control by Agroscope)

year	2005	2006	2007	2008	2009	2010	2011	2012	2013
samples (ready mix)	5	18	26	11	26	16	11	10	43
samples without ragweed seed	0	8	17	3	22	8	5	8	36
seeds kg^{-1} (max.)	366	303	109	220	100	41	10	5	21
mean number of seed kg^{-1}	96	24	10	27	8	4	4	1	1
median seeds kg^{-1}	18	1	0	4	0	0.5	1	0	0

Announced ragweed populations in Canton of Zurich 2006 - 2013

year	2006	2007	2008	2009	2010	2011-13
private gardens	397	65	28	12	14	5-15
public greens	63	13	10	3	3	
roadsides	52	14	9	2	2	3
grassland	22	8	1	1	2	1-3
arable land	8	11	11	12	8	7-10
building sites, gravel pits	18	6	8			
depots of topsoil				2	4	1
industrial wasteland	4	8	3			
other areas	30	22	27	11	3	1
total	**594**	**147**	**97**	**41**	**36**	**30-40**

(G.Popow, JKI Archiv, 445, 2014)

Number of registered agricultural fields (2002 – 2012) and degree of infestation in 2012 in the canton of Geneva

year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	(N. Delabays, 2012, DIME DGA, GE)			
new	24	10	4	2	1	2	2	4	3	16	12	**clean**	a few	casual	dense
total	24	34	38	40	41	43	45	49	52	68	**80**	**30**	**9**	**26**	**15**

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