International meeting of experts, Vienna (AGES), September 27th, 2006

***Ambrosia artemisiifolia* in European Countries: Impacts and Management Options**

Results of the Meeting

Experts from the fields of agronomy, botany and ecology, plant protection, and road maintenance from seven European countries gathered for a one-day workshop on *Ambrosia artemisiifolia* (common ragweed) to discuss the problems caused by this plant and the availability and effectiveness of control measures.

In particular, the experts:

- reported impacts of *A. artemisiifolia* in several European countries on human health, plant health, and nature conservation,
- expressed their concern about an ongoing spread of the species in Europe,
- urged authorities in countries concerned to prevent further import and spread or to control existing populations,
- gave a set of recommendations for all private or public bodies concerned.

Background

A. artemisiifolia is already common and wide spread in several European regions including parts of Hungary, France and Italy. It is still absent from or rare in other parts of Europe but begins to spread and become more frequent and abundant, e.g., in parts of Austria, Germany, and Switzerland.

Ambrosia trifida and *A. psilostachya* also produce allergenic pollen and may cause problems, but are rare in Europe at the moment. They are not the subject of this paper.

The working group unanimously agreed that action to prevent introduction into non-invaded regions and further spread in infested areas of *A. artemisiifolia* and to control populations of the plant is necessary. This has to be achieved before high costs (health, plant health and management) and significant colonization of the geographical potential are reached.

A strategy against *A. artemisiifolia* is challenged by a number of problems:

- Different impacts (on health, on plant protection, etc.) require a cross-cutting, interdisciplinary approach that is difficult to achieve.
- Lack in quality standards for seeds (e.g. bird seeds), grain trade and commerce with regard to *A. artemisiifolia* contamination must be allocated and eliminated in all countries synchronously (EU, CH)
- Control measures are difficult to identify and to implement, as the spread of the plant rely on human activities, and as these measures also depend on the situation in different habitats, climates, crops, levels of infestation and legal conditions in the countries.

Recommendations for the management and control of *Ambrosia artemisiifolia*

Measures against *Ambrosia artemisiifolia* consist in raising awareness, prevention of introduction and further spread, surveillance and control. Application and choice of these measures depend on the level and location of infestation.

Raising awareness

A general basis for all measures should be the illustration of the problem to the public. The information should be directed to a broad audience (e.g., in schools, pharmacies, public places etc.) and in particular to professionals concerned with the species (administration, road and railroad services, farmers, gardeners, bird-seed producers and traders, allergologists, builders etc.).

The information should:

- raise awareness about the problems,
- help to identify the species,
- help to identify and apply the adequate control measures,
- help to reduce risks by handling seeds and grain products and contaminated soil.

Prevention

Introduction and spread of *A. artemisiifolia* seeds should be prevented by

- reducing the contamination of (bird-)seeds, grain or other contaminated consignments,
- cleaning machinery used in areas infested by *Ambrosia* (agricultural, gardening and construction machinery),
- avoiding movement of contaminated soil and gravel from infested areas.

Surveillance and survey

An early detection and early warning system for *A. artemisiifolia* is recommended. Conducting a continued delimiting survey (according to the International Standard for Phytosanitary Measures no. 6 “Guidelines for surveillance”) is necessary. This survey will aim to determine:

- areas in which outbreaks are limited and where eradication may be considered,
- areas where management measures aiming to limit plant impacts and to prevent spread to other areas have to be undertaken.

Control measures

Control measures include eradication, suppression, and containment. Control of *A. artemisiifolia* should aim to reduce both pollen and seed production.

Control experts should be present in areas where establishment and spread is possible. Single stands of *A. artemisiifolia* can be controlled by private individuals. Larger stands (> ~20 plants) must be controlled by specialists.

Priority areas for control should be traffic ways, sunflower fields, wheat stubbles, construction areas, field- and forest edges and river banks, which are pools for spreading the plant.

House gardens can be starting points for invasion, therefore it is important to remove isolated individuals as early as possible.

Each control action should be repeated frequently enough to ensure sufficient suppression. Success of control should be monitored every year before the flowering period of *A. artemisiifolia.*

Mechanical control

Mechanical control includes hand-pulling, cutting, vaporising, burning etc. Gloves and a mask should be used to protect workers.

Small stands of *A. artemisiifolia* (up to 20 plants) should be pulled immediately and given into the domestic waste, escape of pollen should be minimized.

Mowing (also repeated mowing) does not kill the plants completely because of the ability of *A. artemisiifolia* to re-grow. Timing is crucial as it greatly influences the plant's reaction. Mowing immediately before flowering will greatly reduce pollen production. In order to kill the plants, however, it needs to be combined with other control measures.

Chemical control

Chemical control is widely used in agricultural areas. For most crops, with the exception of closely related species (e.g. sunflowers), efficient herbicides are known. The success of chemical control depends on the growth stage of the plant. Information on herbicide efficacy is provided in technical literature.

Chemical control is limited by legal restrictions for the use of herbicides and can have impacts on the environment. In addition, the risk of resistance to herbicides occurs.

Biological Control

Considering that the plant is present in large areas and is spread mostly by human activities, biological control would be a sustainable tool to manage *A. artemisiifolia*.

A. artemisiifolia is a suitable target for biological control in natural, ruderal and settlement areas, as well as along traffic ways. From a risk assessment point of view, the sub-tribe Ambrosiineae does not include crop species in Europe. The risk to *A. maritima*, the only native species of the sub tribe in Europe, has to be assessed. Success of biological control in Australia of *A. artemisiifolia* and of a closely related species (*Parthenium hysterophorus*) is a good argument to aim to develop biological control in Europe. Additional suitable biological control agents have been identified in the native area of *A. artemisiifolia* and have to be investigated further.

Strategies against *Ambrosia* should be tested and verified by ring trials in different regions of Europe.

Legal aspects

Countries should explore legal possibilities to regulate *Ambrosia*. The potential mandatory regulation of *A. artemisiifolia* is illustrated by the Swiss and Hungarian examples: The Swiss federal authorities are responsible for raising awareness, providing information and promoting cantonal enforcement with regard to invasive alien species, including *A. artemisiifolia*. Switzerland has declared *A. artemisiifolia* an undesired plant in the ordinance of plant protection and therefore enforces measures to control the plant effectively even with compensation for farmers concerned. They also support research – e.g. the development of new criteria and methods to facilitate enforcement in the areas of early detection, monitoring, control and outcome evaluation. In Hungary, protection against *A. artemisiifolia* is compulsory for the farmers before the 30th June. Several administrational bodies and the public are active in control and monitoring of *A. artemisiifolia*.

Research and investigation of new or improved measures

A lot of information is already available on *A. artemisiifolia*, but further research would help to improve control of the plant for massive stands and in sensitive locations (e.g., near water and forest). Further

research should focus on biological and ecological aspects as well as on biotic and abiotic requirements, its reproductive strategy, and reaction to management measures. Research should aim at optimizing prevention and control of *A. artemisiifolia* in all affected environments and under different conditions.

Open questions should not slow down immediate action to control *A. artemisiifolia*.

Talks at the International Workshop *Ambrosia artemisiifolia* in European Countries: Impacts and Management Options. Vienna 2006

- *Ambrosia artemisiifolia* in Germany by Beate Alberternst und Stefan Nawrath
- Ragweed along Roads in Lower Austria by Sabine Auer
- Ambrosia in Switzerland by Francis Cordillot
- Status of *Ambrosia artimisiifolia* and its Control in Italy by Massimo Cristofaro and Carlo Tronci
- Experiences on Prevention and Control of Ragweed (*Ambrosia artimisiifolia*) in Hungary by István Dancza
- Control of Ambrosia in the Canton Zürich, Switzerland by Kathrin Fischer
- Research on *Ambrosia artimisiifolia* L. in France by Chauvel Bruno, Gauvrit Christian and Fumanal Boris
- Biology and Life Cycle of *A. artimisiifolia* L. in Hungary by Gabriella Kazinczi and Imre Beres
- Ambrosia in Austria - Mechanical Control Experiments by Gerhard Karrer und Belinda Vitalos
- Success of various control measures by Christian Bohren

More information can be found at

- Austrian Agency for Health and Food Safety - Österreichische Agentur für Gesundheit und Ernährungssicherheit

  www.ages.at
- Neobiota website

  www.umweltbundesamt.at/neobiota
- Das Land Niederösterreich (in German)

  http://www.noel.gv.at/gesundheit/gesundheitsvorsorge-forschung/umweltmedizin-und-umwelthygiene/gs2_gesundheitsvorsorge_ragweed.html
- Swiss Confederation - Federal administration

  www.acw.admin.ch
- Swiss Confederation - Federal office of Meteorology and Climatology MeteoSwiss

  www.meteoswiss.ch/web/en/weather/health/pollen.html
- Swiss Confederation - Department of Environment, Transport, Energy and Communication (in deutsch)

  www.umwelt-schweiz.ch
- Swiss commission for the wild plant conservation CPS/SKEW

www.cps-skew.ch

- Federal Swiss Office of Public Health (in French)
  www.apug.ch/f/aktuell/ambrosia_0_8.php
- InfoPage on Ambrosia (in German)
  www.ambrosiainfo.de
- Association Fançaise d'Etude des Ambroisies (AFEDA) (in French)
  http://perso.orange.fr/afeda/index.htm
- DRASS-DDASS Rhône-Alpes (in French)
  http://rhone-alpes.sante.gouv.fr/sante/environn/rap_am12.htm