

FEASIBILITY OF BIOLOGICAL CONTROL OF COMMON RAGWEED (*Ambrosia artemisiifolia*) A NOXIOUS AND HIGHLY ALLERGENIC WEED IN EUROPE

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Insects - Fungi - Rusts
exert a pressure in their country of origin in North America on *A. artemisiifolia*.
Some of these organisms are already used successfully
within the framework of a Classical Biological Control against the Ambrosia.
Currently, the releases of biological control agents against weeds are carried out after risk analyzes and
regional and/or national authorizations, in accordance with International conventions, international and
regional standards into force.



A NEW APPROACH BY THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION ! Dominique COUTINOT

It should be noted that points of directive 2009/128 published November 24th, 2009 stress the integrated pest management against the harmful organisms (article 14); an adapted formation, including with the biological pest control methods (Annex I); sustainable biological, physical and other non-chemical methods must be preferred to chemical methods if they provide satisfactory pest control (Annex III). In sensitive areas biological control measures should be considered in the first place.

EUROPEAN CONFERENCE, Aix-les-Bains, France, 2008. Dominique COUTINOT & Pierre EHRET

"At the time of this conference, it should be noted that the French scientific community and health authorities do not have any culture or concepts relative to Biological Control of Weeds"

INTERNATIONAL MEETING OF EXPERTS, Vienna, 2006 Uwe STARFINGER

"The experts urged authorities in countries concerned to prevent further import and spread or to control existing populations, considered biological control as an important tool in the strategy of managing *A. artemisiifolia*"

LIST OF THE INSECT BIOLOGICAL CONTROL AGENTS INTRODUCED and/or ESTABLISHED Dominique COUTINOT

- Epiblema strenuana* (Walker) (Lepidoptera: Tortricidae)**
1984 Australia (origine: Mexico) established in Queensland
- 1991 China (province of Hunan) (origine: Mexico) in evaluation
- Zygogramma bicolorata* Pallister (Coleoptera: Chrysomelidae)**
1980 Australia (origine: Mexico) established
- Zygogramma disrupta* Rogers (Coleoptera: Chrysomelidae)**
1990 Russia (origine: USA) in evaluation
- Zygogramma suturalis* (Fabricius) (Coleoptera: Chrysomelidae)**
1978 Georgia (origine: Canada & USA) establishment to be confirmed
- 1978 Ukraine (origine: Canada & USA) establishment not confirmed
- 1978 Russia (origine: Canada & USA) established
- 1985 ex Yougoslavia (origine: USA) establishment to be confirmed
- 1988 China (origine: Canada) establishment in some provinces
- 1980 Australia (origine: USA) not established

"A success in Australia, moderated success in Russia in agricultural zones, establishments must be confirmed and evaluated for Croatia, Georgia and the Ukraine"

LIST OF POTENTIAL FUNGAL PATHOGEN BIOLOGICAL CONTROL AGENTS & SPECIES UNDER CONSIDERATION IN HUNGARY Levente KISS

Protomyces gravidus, causing an endemic stem gall disease on giant ragweed (*A. trifida*) in the USA, was evaluated as a **potential mycoherbicide** against both giant and common ragweed. ***Phoma* sp.**, isolated from *A. artemisiifolia* in Canada performed well in inundative experiments alone and especially in combination with a leaf-eating beetle, ***Ophraella communa*** (Col. : Chrysomelidae). To our knowledge, none of these, or any other fungal pathogens, are currently investigated as potential BCAs of *A. artemisiifolia* except a strain of ***Sclerotinia sclerotiorum*** which is under consideration as a mycoherbicide in Hungary. ***Puccinia xanthii***, a microcyclic autoecious rust reported to infect common ragweed in some parts of the USA has already been proposed as classical BCAs of ragweed in Hungary. In addition, a mycoherbicide product based on a strain of ***Sclerotinia sclerotiorum*** is under development in Hungary.

"A mycoherbicide is under development for a use against the ambrosia in Hungary"

STUDIES UNDER CONSIDERATION IN ITALY Massimo CRISTOFARO

Various stages for a biological control program in Lombardy:

- Evaluation of the distribution of *A. artemisiifolia* in Italy
- Characterization of the populations of *A. artemisiifolia*
- Characterization of the populations of insects in the USA
- Specificity tests of the selected insects
- Selection of one or more fungi
- Specificity tests of selected fungi
- Studies of the interactions insects/fungi
- Evaluation BC agents impacts against *A. artemisiifolia*, ...

"Only, a program with several European countries can allow a Biological Control program in Italy"

SUCCESS OF BIOLOGICAL CONTROL IN AUSTRALIA Rachel McFADYEN



***Zygogramma bicolorata* & *Epiblema strenuana* (origine: Mexico)**

"In Australia, biological controls have been implemented as a management option for ragweed in Australia. Several insect species have been introduced for biological control of common ragweed, two of which are established and giving good control"

Zygogramma bicolorata Pallister (Coleoptera: Chrysomelidae) was introduced from Mexico in 1980 as a biocontrol agent for the weed ***Parthenium hysterophorus* L.** (Asteraceae). Defoliation has immediate negative effects on plant performance and as a consequence affects the growth, reproduction and fitness of the plants. In some locations and years, ***Z. bicolorata* caused 85-100% defoliation** resulting in significant reductions in plant density, growth and flower production.
Epiblema strenuana (Walker) (Lepidoptera: Tortricidae), was introduced from Mexico in 1982 for biological control of ***P. hysterophorus*** and became widely established within 2 years of introduction. ***E. strenuana*** now occurs throughout the range of its host plants parthenium, Noogoora burr (***Xanthium occidentale* Bertol.**) and annual ragweed (***A. artemisiifolia* L.**) in Australia. **Galls can kill seedling plants and severely reduce growth of larger plants.**

"As a result annual ragweed is no longer a serious weed in eastern Australia"

BIOLOGICAL CONTROL IN RUSSIA Mark VOLKOVITSH



***Zygogramma suturalis* (origine: USA & Canada)**

In 1978, the ragweed leaf beetle ***Zygogramma suturalis* F.** was introduced to Russia from the USA and Canada to control the common ragweed, ***Ambrosia artemisiifolia* L.** The initial phase of this introduction was a population explosion with more than a 30-fold yearly increase in number and population density (up to 5,000 adults/m² in aggregations). In 2005 et 2006, selective quantitative sampling over the whole area infested by *A. artemisiifolia* in Southern Russia were conducted. The average population density of the ragweed leaf beetle was very low: **0.001 adults/m²** in crop rotations and **0.1 adults/m²** in more stable habitats.

"However, having regard to the spectacular success achieved in the permanent experimental plot in 1983-1985, it is still possible that stable protected field nurseries could be a promising method of *Z. suturalis* propagation for biological control of ragweed in surrounding areas"

CONCLUSIONS

The ambrosia has a very wide geographical distribution and cannot be taken into account by the quarantine regulations in the great majority of the countries. Exploration in the countries of origin for the discovery of new BC agents, the study of these agents, the experiments put into practice must support a European program for the Biological Control against the ambrosia.

Only a EUROPEAN POLITICAL WILL can encourage with the implementation of a biological control program against the common ragweed in Europe.