

## COST

COST is an intergovernmental framework for European Co-operation in Science and Technology, allowing the coordination of nationally-funded research on a European level.

COST contributes to reducing the fragmentation in European research investments and opening the European Research Area to cooperation worldwide.

As a precursor of advanced multidisciplinary research, COST plays a very important role in building a European Research Area. It anticipates and complements the activities of the EU Framework Programmes, constituting a "bridge" towards the scientific communities of emerging countries.



**COST Action FA1203 received financial contributions based on a joint work programme (4 years) for:**

- Science management meetings
- Working group meetings
- Scientific workshops & seminars
- Training schools
- Scientific exchange visits
- Dissemination & publications

## SMARTER

The development and implementation of a sustainable control programme against *Ambrosia artemisiifolia* constitutes an innovative management approach for Europe that also serves as a template for future problems with invasive alien plants.

SMARTER brought together an interdisciplinary network of experts involved in the control of ragweed, health care professionals, aerobiologists, ecologists, economists, and atmospheric and agricultural modellers. The Action numbered almost 200 registered participants from 30 COST member countries, 4 COST near neighbour countries, 1 COST member state and 10 institutions from other countries.

SMARTER has provided a forum for discussing long-term management and monitoring options and the development of new innovative management solutions, such as a synergy between biological, physical and chemical control measures and vegetation management, and assess their cost-effectiveness in mitigating the effects of invasive alien species.

### SMARTER participants worked in 6 different areas:

1. Biological control & population dynamics
2. Vegetation management
3. Integration of management options
4. Management evaluation
5. Training, knowledge and technology transfer
6. Policy support

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Food and Agriculture  
COST Action FA1203

## Sustainable management of *Ambrosia artemisiifolia* in Europe

# SMARTER

2013-2017

[www.ragweed.eu](http://www.ragweed.eu)



Photo: Kinga Klára Mátyás

## The problem with ragweed



Photo: Christian Bohren

Ragweed produces extremely large amounts of pollen that is particularly allergenic.

Common ragweed (*Ambrosia artemisiifolia*, Asteraceae), originating from North America, is one of the most prominent invasive alien species in Europe. Ragweed pollen allergens are a major cause of hay fever symptoms in late summer in large parts of Europe.

Ragweed produces extremely large amounts of pollen that is particularly allergenic.

Ragweed has increasingly become a major weed in European agriculture, especially in spring-sown crops such as sunflower, maize, sugar beet, soya beans and tobacco. Its range is likely to increase under climate change and long-term, sustainable and widely applicable management is required.

Coordinating institutions involved in *Ambrosia* research helps implement management strategies throughout Europe.

## Biological control

One long-term management tool not yet implemented in Europe is biological control, either by introducing host-specific arthropods or fungal pathogens from the area of origin of the plant, or by increasing the density of native natural enemies.

## *Ophraella communa* in Europe

SMARTER formed a Task Force to quantify and evaluate the potential benefits and risks of the oligophagous leaf beetle *Ophraella communa* LeSage 1986 (Coleoptera: Chrysomelidae) following its accidental introduction in Northern Italy. *O. communa* is successfully used for the biological control of ragweed in China, and its presence in the Milan area coincided with a drastic decrease in atmospheric ragweed pollen that could not be explained by meteorology - Bonini et al. (2015) *Aerobiologia* 31(4), 499-513.



Even late attached plants are prevented from flowering (no seeds and pollen)

## Key achievements to date

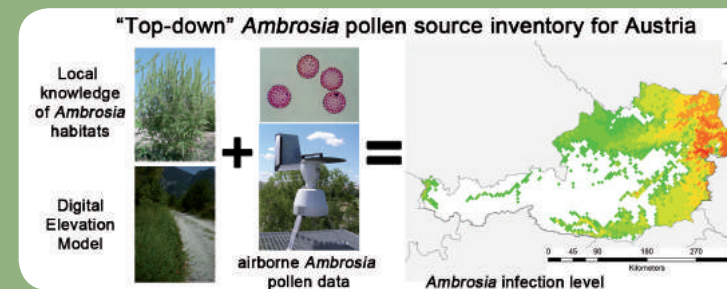
Task Force Population Dynamics monitored 40 ragweed populations across Europe over 3 years, forming the basis for a climate and habitat dependent demographic model describing ragweed performance. In the absence of ragweed management, ragweed density generally decreased over time, most likely due to succession of the vegetation.

Working Group 2 organised a Training School on vegetation management with participants from 8 different countries, Working, developed protocols for seed collection and storage, manuals for efficient vegetation management and for soil seed bank analysis, and initiated a joint experiment on best practice of viability tests of ragweed seeds.

Task Force Genetics elaborated and shared molecular markers and methods for studies on the general patterns of genetic variation, colonization history and spread of ragweed populations worldwide.

Working Group 3 organized a workshop, bringing together SMARTER participants to share experiences with *Ambrosia* control in various habitats and resulted in a series of leaflets providing information on the currently best management practices in different habitats.

Working Group 4 is evaluating ragweed control measures by examining case studies in France and Italy. In addition, a top-down pollen source inventory that combines pollen data, land cover data and habitat management models, was developed by members of WG4 and can be used for forecasting atmospheric pollen concentrations and evaluating the integrated management of *Ambrosia* for all major regions infested with ragweed within the EU27 zone (e.g. France, Austria, Pannonian Plain, and Italy).



Karrer et al. (2015). *Science of The Total Environment* 523(0), 120-128.