

Introduction: the HALT Ambrosia project

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Common ragweed – a troublesome invader

Ambrosia artemisiifolia (common ragweed) is a tall erect annual of the daisy family (Asteraceae) native to North America. The plant has been inadvertently imported to many countries in Europe, Asia and Australia. In Europe, the first populations were found in the mid-1800s. The species has spread over several regions in Europe, having been introduced separately to France and Northern Italy and later to South-eastern Europe from the 1900s onward. At present it is spreading through Europe and Asia. Information about the current distribution and densities of its appearance is scattered in national databases and publications. This invasive weed has established on arable and non-cultivated land like roadway sides and construction land. *A. artemisiifolia* can be a strong competitor to sunflowers, potatoes, pumpkins and legumes and can lead to high yield losses. The male flowers produce large quantities of pollen which are of high allergenic potential. Although not sufficiently shown so far, impacts on biodiversity can also not be excluded. The plant thus is a heavy burden on public health, agriculture and biodiversity with resulting high economic losses.

European Commission: DG ENV work on invasive species

In the EU Commission, DG Environment, activities “Towards an EU Strategy on Invasive Species” date back to 2008 and before. More recently DG ENV initiated two open calls for proposals in 2010 to further support the development of policies in the field. Two projects resulted from this, “Assessing and controlling the spread and the effects of common ragweed in Europe (ENV.B2/ETU/2010/0037)” finished in October 2012 and “Complex research on methods to halt the Ambrosia invasion in Europe - HALT Ambrosia” finished in May 2014. Both these projects focussed on common ragweed which was used as a flagship species for these projects which served as pilot studies for possibilities to deal with invasive plants. Meanwhile, further developments led to the “REGULATION (EU) No 1143/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species” which entered into force on 1 January 2015. This Regulation seeks to address the problem of invasive alien species in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as to minimize and mitigate the human health or economic impacts that these species can have. The Regulation foresees three types of interventions; prevention, early detection and rapid eradication, and management. A list of invasive alien species of union concern has recently been developed.

The project HALT AMBROSIA 2011-2014

The project was jointly implemented by the following institutions:

Project co-ordinator: Julius Kühn-Institut, Bundesforschungsinstitut für Kulturpflanzen, Braunschweig, Germany (JKI),

Project partner: Universität für Bodenkultur Wien, Austria (BOKU)

Project partner: Plant Protection Institute, Hungarian Academy of Sciences, Hungary (PPI)

Project partner: Kaposvar University, Hungary (KU)

Project partner: Agricultural Institute of Slovenia, Slovenia (KIS)

Project partner: Aarhus University, Denmark (AU)

with support from associated partners:

CAB International (CABI), Delemont, CH,

ACW Changins CH,

Projektgruppe Biodiversität, Friedberg, DE

The overall aim of our project was to contribute to the reduction of the prevalence of the invasive alien plant *A. artemisiifolia* in European countries in order to reduce the burden on public health, agriculture and biodiversity. We developed strategy elements for the reduction of the occurrence of ragweed and its pollen in countries where the species is already established, e.g., Hungary, Slovenia, parts of Austria, and South-eastern Central Europe and for the prevention of further import and spread in countries not yet heavily infested, such as Germany, Denmark and Northern European countries. The gaps in the existing information which is needed for understanding historical successes and failures of prevention, control and eradication activities were analysed. This included:

- a fuller understanding of critical elements in the life history of common ragweed
- an evaluation of chemical, mechanical and biological control measures

Laboratory and field experiments about the germination biology and seed bank behaviour and the proportion of viable seeds found in silage and biogas plants and transported commodities such as soils were investigated. Efficacy of non-chemical control measures on Ambrosia and of combinations thereof were determined as well as the best use of herbicides. Therefore information on the best application and timing of control measures could be derived. Also the impacts of ragweed stands on other plants as well as impacts of control measures on non-target species were part of the research.

The research led to the publication of individual results in various forms, including journals, conference papers etc. The full research report as sent to and accepted by the Commission was available on the project website (no longer online) and is found on that of the Commission: http://ec.europa.eu/environment/nature/invasivealien/index_en.htm. Several project partners have expressed the wish to have all the research available in a single volume, including that not deemed suitable for publication in peer-reviewed journals.

The project has contributed to building a network of scientists who study various aspects of the ragweed issue. Even after the project has helped answer some questions, the work on common ragweed needs to continue. Project partners team up with other researchers in order to carry on with scientific studies but also to seek practical solutions for the ragweed problem: how to save people from bad health, farmers from yield losses and the environment from a potentially noxious invader. Currently many of the project partners and scores of other scientists are engaged in the COST action FA 1203 SMARTER (ragweed.eu) and also in the International Ragweed Society (www.international-ragweedsociety.org), both of which aim at helping solve the ragweed problem. For these researchers the present volume may be of value.

We are grateful that the Julius Kühn-Institut offered to produce and fund this volume. The results presented here were mainly found in the years 2011 – 2014, and the texts, including citation of references could not be brought to the newest state throughout. We still hope that the book can contribute to readers being able to access the current state of some of the knowledge on ragweed in a comprehensive form and thus carry on with the work.