**Ambrosia artemisiifolia**

**System:** Terrestrial

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Phylum</th>
<th>Class</th>
<th>Order</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plantae</td>
<td>Magnoliophyta</td>
<td>Magnoliopsida</td>
<td>Asterales</td>
<td>Asteraceae</td>
</tr>
</tbody>
</table>

**Common name**

ambrosia con foglie di atremisia (Italian, Italy), bitterweed (English), vermellapu ambrožija (Latvian, Latvia), kietine ambrožija (Lithuanian, Lithuania), Aufrechte Ambrosie (German, Germany), bastard wormwood (English, United Kingdom), hog-weed (English), ambrosia aux feuilles d’armoise (French, France), ragweed (English), artemisia del pais (Spanish), ambrosia de hojas de ajenjo (Spanish), ambrosie annuelle (French, France), blackweed (English, Canada), stickweed (English, Canada), carrot-weed (English, Canada), stammerweed (English, Canada), wild tansy (English, Canada), ambrosie élevée (French, France), Beifußambrosie (German, Germany), roman bitterweed (English, Canada), hay-fever weed (English, Canada), vadvkender (English, Hungary), ambrožja bylicowata (English, Poland), marunatuoksukki (English, Finland), beiskambrosia (English, Norway), parlaflu (English, Hungary), ambrozja bylicolistna (English, Poland), pujulehine ambroosia (English, Estonia), bynke-ambrosie (Danish, Denmark), low ragweed (English), Roman wormwood (English), malörstambrosia (English, Sweden), annual ragweed (English), short ragweed (English), common ragweed (English), Hohes Traubenkraut (German, Germany), Aufrechtes Traubenkraut (German, Switzerland), small ragweed (English), Shinners ragweed (English, South Korea), Stalin weed (English, Hungary), petite herbe à poux (French, Canada), ambroisie à feuille d’armoise (French, France), Beifussblättriges Ambrosie (German, Germany), Beifussblättriges Traubenkraut (German, Germany), römischer Wermut (German, Germany)
Ambrosia artemisiifolia is a summer annual herbaceous plant that is native to temperate North America in the United States and Canada. Also commonly known as ragweed this forb establishes easily in human impacted and disturbed areas in high abundance. It is considered an invasive species in Europe, parts of Asia and Australia, although it is not an extremely competitively aggressive species and is mainly considered a noxious weed that interferes with other cultivated crops. The main impact of this plant is the copious amount of pollen produced from male flowers that are allergens to sensitive people, compounding health problems like rhinitis, oculorhinitis, asthma and causing skin irritations.
Species Description
*Ambrosia artemisiifolia* is a summer annual herbaceous plant that is erect, with many branches (AWCNI, undated) and can reach heights between 1-2 metres (NRW, 2007) with a grooved, reddish, hairy stem (Wittenberg, R. (ed.) 2005). The leaves are opposite, compound, and toothed (Wittenberg, R. (ed.) 2005) reaching lengths of 4-10cm long (VTWIG, undated). The tops of the leaves are green and hairy, with white hairs adpressed on the underside of the leaf (Wittenberg, R. (ed.) 2005). Male flowers are green, small, 4-5mm, with bractless flowers arranged in a terminal spike located in the upper portions of the plant (Wittenberg, R. (ed.) 2005), often drooping (AWCNI, undated). The female flowers are located in the axils of the upper leaves, sessile, and inconspicuous in either small clusters or singly (Wittenberg, R. (ed.) 2005). The fruit of the common ragweed is a woody achene, 3-4mm long and 1-2mm wide, with 4-7 spine-like projections, resembling a crown (VTWIG, undated). The leaves are bright green on both sides with whitish nerves. On older plants the lower leaves can be arranged opposite and the upper leaves can be alternately arranged on the stem (C. Bohren., pers.comm., 2007).

Lifecycle Stages
*Ambrosia artemisiifolia* is a summer annual plant. Fruit and seed production begin after fertilisation around the middle of the summer and into the fall. Seeds are shed directly from the parent plant and most seeds land with proximity to the parent plant with a seed rain of 500-7300 seeds/square metre (EPPO, 2006). Seeds enter a dormancy period that requires a cold stratification in order to germinate (Bazzaz, 1970). Germination occurs in the spring with only a portion of the seed bank germinating while the rest of the seeds enter a secondary dormancy period (Bazzaz, 1970). The secondary dormancy of the seed makes this species well adapted at surviving in continuously disturbed sites (Bazzaz, 1970). Seeds have been known to remain viable after 20 years of burial with 85% germination rate (Lewis, 1973).

Uses
An essential oil of *Ambrosia artemisiifolia* acts as an antimicrobial, having antibacterial and antifungal compounds (Chalchat et al. 2004).

Habitat Description
*Ambrosia artemisiifolia* is commonly found in ruderal or waste sites associated with frequent and extensive disturbance regimes resulting from human activities. Roadsides, railways, gravel pits, construction sites, agricultural fields, waterways, urban areas, and private gardens are all sites that this species establishes easily and prolifically on (Bohren, 2006). Common ragweed is a pioneer species establishing after disturbance in early successional plant communities (Maupin & Apparicio, 2004). It prefers full sun and warm areas, with nutrient rich and slightly acidic soils (Wittenberg, R. (ed.) 2005) and can tolerate dry soil conditions (Maupin & Apparicio, 2004). The texture of the soil does not play an important role in establishment but the thickness of the organic layer is inversely related to its presence (Maupin & Apparicio, 2004).
Reproduction
Common ragweed is a monoecious plant with male and female sex organs occurring in different flowers located on separate areas of the same plant. Flowering period is daylength dependent (Bohren, 2006) and is from early summer to early autumn (Wittenberg, R. (ed.) 2005). This species is self-compatible (Genton et al. 2005), meaning that it can self-fertilise for seed production. The mechanism for pollination is through the wind, since the flowers are not attractive to insects (Genton et al. 2005).

General Impacts
Common ragweed is an abundant seasonal aeroallergen in late-summer to early fall (Wayne et al. 2002) resulting in millions of dollars annually in health care costs and lost labour hours (Bohren, 2006). In studies performed in Europe and North America, approximately 10-15% of the population is sensitive to the pollen of common ragweed (Bohren, 2006) causing rhinitis, oculorhinitis, asthma, and dermatitis(Bass et al. 2000). A. artemisiifolia is also considered a weed pest in agricultural crops like sunflower, sugarbeet, corn and other cereal crops (Wittenberg, R. (ed.) 2005). It also displaces native vegetation in its introduced range especially after a disturbance such as overgrazing or construction which put competitive pressures on the native flora (Protopopova et al. 2006). A. artemisiifolia fruits are a food source for the bobwhite quail but can cause illness in livestock that ingest it (USGS-NPWRC, 2006).

Management Info
Preventative measures: Preventing an infestation is the most cost-effective approach to weed control. Preventative measures include maintaining healthy vegetation to inhibit the establishment of common ragweed, detection and surveillance along with proper land management to deter an infestation (NRW, 2007) and prevention of overgrazing, sourcing animal feed and hay, along with commercial agricultural seed (NWR, 2007). Hand-pulling of single plant stands should be combined with early detection and surveillance in areas with beginning infestation (C. Bohren., pers.comm., 2007). European scientists issued a Call for Action in 2008 to motivate responsible authorities to adopt measures to prevent further spread of ragweed in Europe and to control current infestations (C. Bohren., pers.comm., 2008). Please follow this link to read the English language version of 'The “Guidelines for management of Ambrosia”, Buttenschøn et al 2009. The Guidelines are also available in Danish, French, German, Italian and Slovene. The Guidelines have been developed to provide European authorities, private landowners, gardeners, constructors, birdseed producers, trade companies dealing with agricultural products with scientifically based, but simple and operative practical management methods to prevent further invasion and reduce the abundance of common ragweed. Please follow this link for detailed information on physical, mechanical, biological, cultural and integrated methods used to control the common ragweed compiled by the IUCN/SSC Invasive Species Specialist Group.
Pathway

Another introduction of *Ambrosia artemisiifolia* is thought to have occurred in France through the cultivation of potatoes and legumes (Chauvel et al. 2006). The plant was intentionally grown and cultivated in Ukraine for medicinal purposes and subsequently escaped from agricultural fields (Protopopova et al. 2006). The seed of *Ambrosia artemisiifolia* is often found in commercial bird mixes and is considered one of the main ways the species was introduced into several European countries. The species was found in contaminated cereal seed, like sunflower and sorghum and introduced by those means as well (Bohren, 2006). A common practice in neighbouring countries in Europe, particularly between Switzerland, France and Italy, building construction materials and substrates near borders are exchanged leading to contamination and facilitation by disturbance (Bohren, 2006). War has been cited as a mechanism of dispersal for this species since disturbance favors its spread and establishment. Horse-fodder for calvary is considered a contaminant source along with depots for stationing troops (Chauvel et al. 2006). In Yugoslavia war was responsible for the spread of *A. artemisiifolia* into fallow lands (Bohren, 2006).

Witterberg, R. (ed.) 2005. An inventory of alien species and their threat to biodiversity and economy in Switzerland. CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape;

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**Review:** Christian Bohren, Station de recherche Agroscope Changins-W?denswil ACW Switzerland

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GLOBAL INVASIVE SPECIES DATABASE
FULL ACCOUNT FOR: Ambrosia artemisiifolia

[1] ITALY
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[1] LITHUANIA
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[1] PERU
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[2] RUSSIAN FEDERATION
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[1] SERBIA AND MONTENEGRO
[1] SLOVENIA
[1] SWEDEN
[1] TAIWAN
[1] UKRAINE
[5] UNITED STATES

BIBLIOGRAPHY
35 references found for Ambrosia artemisiifolia

Management information
Summary: The main source article cited for its relevance to introduction, spread, health, ecology, management options and legal aspects for the control efforts in Switzerland for common ragweed.
Summary: The guidelines for management of common ragweed are based on the results of the project Strategies for Ambrosia control (AMBROSIA) funded by Euphresco 2008 ? 2009. These guidelines are also available in 6 languages [Danish, English,French, German, Italian and Slovene] at the project homepage: EUPHRESCO project AMBROSIA 2008-09.
Danish, French, German, Italian and Slovene versions can be downloaded from: http://www.agrsci.dk/ambrosia/outputs/guidelines.html [Accessed 17 March 2010]
Summary: A thorough article describing species of insect, beetles and moths, that are currently being explored as biological control agents of common ragweed. It also details the disadvantages to herbicide and mechanical treatment.
Summary: A report on some of the current efforts in collaboration between the Chinese and American educational institutions to work on invasive species and biological control agents. Common ragweed was among the species mentioned and describes some of the risks to biological control as well as a few species attempted as control.
Summary: A report on the general impact common ragweed is having in European countries and some of the management options available, with a focus on measures to prevent its introduction into new areas of Europe.
Summary: A factsheet produced by the Australian government giving plant description, habitat, lifecycle, and various control options.

**Summary:** A paper discussing the effect summer annuals have on the fall vegetative composition and how winter annuals can suppress summer annual weeds, including ragweed. It primarily discusses the ecology dynamics between ragweed and winter annuals, with management options on cultural practices that could further suppress ragweed.


**Summary:** An article describing the failures of a biological control attempt in Russia using Zygogramma suturalis and the causes as to why it was unsuccessful.

Wan, F.H., & Wang, R., Undated, Biological Weed Control in China: An Updated Report, Biological Control Institute, Chinese Academy of Agricultural Sciences, China.

**Summary:** This report reviews the potential biological controls available and in testing phases for the control of ragweed. Some species have had set backs in field trials while new species are being considered.


**Summary:** Online journal article accessed through JSTOR describing secondary dormancy in Ambrosia artemisiifolia and different treatment methods on how to break secondary dormancy.

Chalchat, J-C., Maksimovic, Z.A., Petrovic, S.D., Gorunovic, M.S., et al, May/June 2004, Chemical Composition and Antimicrobial Activity of Ambrosia artemisiifolia L. Essential Oil, Journal of Essential Oil Research (JEO) **Summary:** A brief citation on some of the recent research exploring alternative uses for the plant common ragweed. This article explores its use as a potential source for antimicrobial compounds.


**Summary:** A good journal article exploring the means and methods of introduction of ragweed into france through historical and herbarium records. This article gave lots of insight into human dispersed methods with dated records.


Summary: English: The species list sheet for the Mexican information system on invasive species currently provides information related to scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php?Portada), under the section Novedades for information on updates.


Spanish: La lista de especies del Sistema de información sobre especies invasoras de México cuenta actualmente con información acerca de su nombre científico, familia, grupo y nombre común, así como estado de la invasión en México, rutas de introducción y vínculos a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una lista directa a la página de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualización, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php?Portada), en la sección Novedades, para conocer los cambios.


Summary: A good source for the global distribution of common ragweed, along with habitat, and introduction methods. Available from: http://www.eppo.org/QUARANTINE/Alert_List/deleted%20files/weeds/Ambrosia_artemisiifolia.doc [Accessed 13 March 2007]


Summary: An article cited for the distribution of common ragweed in France and possible means of introduction into the country.


Summary: This webpage was cited for its comprehensive list of related synonyms for common ragweed.


Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.


Summary: Interesting article discussing political changes in government in association with the spread of common ragweed in the country. This article was cited for a common name and distribution.

Kress, H., 2007, Henriette's Herbal Homepage, Ambrosia artemisiifolia, [online photo database].

Summary: An online private plant photo page that was referenced for common names associated with the plant Ambrosia artemisiifolia in German, Finnish, Danish, French, and English among others. Available from: http://www.henriettesherbal.com/php/get.php?id=774 [Accessed on 12 March 2007].


**Summary**: A paper on various controlled studies done in undisturbed and disturbed fields. The management options tested provide insight into integrated management and land use strategies suited for a particular disturbance regime.


**Summary**: This paper was cited for the geographical references made to the distribution of common ragweed in China.


**Summary**: This article gave common names for ragweed in Canada, along with details of the ecology and disturbance that ragweed plays in suburban and urban environments.


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