

Mini data sheet on *Ambrosia trifida* (Asteraceae)

Added in 2014 - Deleted in 2015

Reasons for deletion:

Ambrosia trifida was added to the EPPO Alert List in 2014 and transferred to the List of Invasive Alien Plants in 2015.

Why

Ambrosia trifida (Asteraceae) is a tall annual plant originating from North-America. One of its English common names is 'Giant Ragweed'. The species is declared as a noxious weed in the USA, and is a quarantine weed in Poland and Russia. Because some populations were recently observed in Southwestern France in maize and soybean crops, the French NPPO suggested adding *A. trifida* to the EPPO Alert List.

Geographic distribution

EPPO region: France, Georgia, Germany, Italy, the Netherlands, Romania, Russia, Serbia, Spain, Switzerland.

North-America (native): United States of America (Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming), Canada (Alberta, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan).

Central America (native): Mexico.

Asia: China, Japan, Republic of Korea.

Note: *A. trifida* is transient (= casual) in Belgium and was observed for the first time in 1829 and lately in 2005 and is considered to have entered as a contaminant of grain and wool. The plant has also been observed as transient in Austria, Belarus, Czech Republic, Denmark, the United Kingdom, Estonia, Ireland, Latvia, Lithuania, Moldova, Norway, Poland, Slovakia, Slovenia, Ukraine. It is often quite difficult to determine whether the species is established or transient. In Israel, the plant was found during summer 2001 and was eradicated with herbicide treatments (2,4-D).

Morphology

A. trifida is an erect summer annual plant generally growing about 1.5 m tall, but which can reach 4-6 m tall in fertile and moist soils. Roots are primarily fibrous, but a short taproot is also present. Stems are unbranched to frequently branched and have large distinctive opposite 3 palmate-lobed leaves (occasionally 5-lobed or simple) 10-20 cm wide, 15 cm long. Lobes are ovate to lanceolate, and the margins are toothed. Mature plants have stems that are rough and hairy. Individual flowers are small, greenish-yellowish and inconspicuous. Male/staminate flowers are in long (up to 30 cm) narrow racemes at the end of branches. Female/pistillate flowers are clustered at the base of the racemes and in the axils of the upper leaves. A single seed is enclosed in the large (6-12 mm long) fruit (achene). The brown or grey achene, usually referred to as the seed, is crown-shaped with a long, pointed central beak surrounded by 5 shorter points.

Biology and ecology

A. trifida occurs in a wide range of soils and rainfall zones, but generally prefers finer, moister soils with a summer rainfall regime, and will develop into a very large plant in the right conditions. Flowers are present from July to September in the USA and are wind pollinated. Seeds generally begin to mature in mid-August. Most germination in the field occurs from early- to mid-spring. Seeds can germinate at a wide range of temperatures from 8°C to 41°C, but with an optimum range of 10-24°C. When present in disturbed habitats, *A. trifida* can become the dominant species throughout the entire growing season. By being one of the first plants to emerge in early spring, *A. trifida* has an initial competitive advantage over other summer annuals in sites cultivated in late autumn or early spring.

Seed numbers are generally low to average (around 275 seeds up to 5000 seeds have been reported). In the native range of the plant, seeds generally begin to mature in mid-August.

In which habitats

A. trifida is most commonly found in disturbed sites, such as cultivated fields including irrigated fields, gardens, ditches, roadsides, earthworks, field margins, pastures and grasslands. Within the EPPO region, *A. trifida* is mainly found around ports (engaged in grain import) and in places of cereal processing. The species is very often found on riverbanks. According to the Corine Land Cover nomenclature, these habitats correspond to: arable land; permanent crops (e.g. fruit tree and berry plantations, olive); pastures; natural grassland; banks of continental water, riverbanks/canalbanks (dry river beds); road and rail networks and associated land; other artificial surfaces (wastelands); green urban areas, including parks, gardens, sport and leisure facilities.

Pathways

The main pathway for the spread of *A. trifida* is through contamination of seed lots as well as through accidental movement via agricultural equipment. Most seeds fall next to the parent plant, but some are able to disperse long distances with water. Seeds are also reported to be spread with the help of human or animal action, though birds and other animals do not consume seeds of *A. trifida* as these are not an attractive food source. Seeds remain viable in the soil for several years.

Impacts

A. trifida is a serious pest in cultivated fields in particular in soybean (*Glycine max*), beans (*Phaseolus* spp.) and maize (*Zea mays*), as well as in other cereals such as wheat (*Triticum* spp.) or in cotton (*Gossypium hirsutum*). Yield losses (through competition and allelopathy) can be over 50% in annual crops such as soybean (Weaver, 2003). In Southwestern France, *A. trifida* has also been found in sunflower (*Helianthus annuus*) and sorghum (*Sorghum* spp.) crops. *A. trifida* competes for nutrients and light, and interferes with harvesting. *A. trifida* is also considered to act through allelopathic interference. As the species is very competitive, it may have a negative impact on biodiversity, in particular in moist flood plains. As with other *Ambrosia* species, *A. trifida* produces a large amount of pollen which is severely allergenic, causing allergic rhinitis and bronchial asthma, as well as skin reactions in susceptible people.

Control

A. trifida is extremely competitive and is difficult to control. Although the species has several natural predators, none seem to cause sufficient impact to damage the plant. Intensive agriculture and not allowing any emerging plant to mature can manage *A. trifida* over time. Early tillage, hand-pulling, repeated mowing and pre-/post-emergence herbicides are effective ways of managing *A. trifida*, although long-term management efforts must include a combination of cultural, mechanical and chemical measures. Herbicide resistance to glyphosate has been noted. Perennial grazing sites, or fodder production sites, where grazing or mowing is frequent, will also destroy *A. trifida* over time.

Sources

- ANSES, Guillaume Fried, Fiche d'alerte ou de signal, 2013.
- Barnett KA, Steckel LE (2013) Giant ragweed (*Ambrosia trifida*) competition in cotton. *Weed Science* 61, 543-548.
- CABI Invasive Species Compendium, *Ambrosia trifida*. <http://www.cabi.org/isc/datasheet/4693>
- Euro+Med PlantBase, *Ambrosia trifida*. <http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameCache=Ambrosia+trifida>
- Flore Laurentienne, Edition interactive, *Ambrosia trifida*. http://www.florelaurentienne.com/flore/Groupes/Spermatophytes/Angiospermes/Dicotyles/103Composees/11_Ambrosia/trifida.htm
- Follak S, Dullinger S, Kleinbauer I, Moser D, Essl F (2013) Invasion dynamics of three allergenic invasive Asteraceae (*Ambrosia trifida*, *Artemisia annua*, *Iva xanthiifolia*) in central and eastern Europe. *Preslia* 85, 41-61.
- Illinois Wildflowers, *Ambrosia trifida*. http://www.illinoiswildflowers.info/weeds/plants/giant_ragweed.htm
- Kong CH, Wang P, Xu XH (2007) Allelopathic interference of *Ambrosia trifida* with wheat (*Triticum aestivum*). *Agriculture, Ecosystems and Environment* 119, 416-420.
- PingPing Y, Yin Hong L, Bei S, JiaNan S, GuoJiao W, XueFei Y (2010) Impacts of *Ambrosia trifida* invasion plant biodiversity, *Journal of Northwest A & F University - Natural Science Edition* 38, 189-194.
- Plantwise Knowledge Bank, *Ambrosia trifida*. <http://www.plantwise.org/KnowledgeBank/Datasheet.aspx?dsid=4693>
- United States Department of Agriculture, Natural Resources Conservation Service, *Ambrosia trifida*. <http://plants.usda.gov/core/profile?symbol=AMTR>
- Vink JP, Soltani N, Robinson DE, Tardif FJ, Lawton MB, Sikkema PH (2012) Glyphosate-resistant giant ragweed (*Ambrosia trifida* L.) in Ontario: dose response and control with postemergence herbicides. *American Journal of Plant Sciences* 3, 608-617.
- Weaver SE (2003) Correlations among relative crop and weed growth stages. *Weed Science* 51, 163-170.

