

# *Ambrosia confertiflora* (Asteraceae)

## Why

*Ambrosia confertiflora* (Asteraceae) is a perennial herb native to northern Mexico and the southwestern United States. One of its English common names is 'burr ragweed'. This species has been introduced to Australia and Israel. *A. confertiflora* has severe agricultural and environmental impacts, and its pollen is a severe allergen. This species has a limited distribution in the EPPO region, and can be considered an emerging invader.

## Geographic distribution

**EPPO region:** Israel.

**North America:** USA (native) (Arizona, California, Colorado, Hawaii (alien), Kansas, Nebraska, New Mexico, Oklahoma, Tennessee, Texas, Utah).

**Central America and Caribbean:** México (native) (Aguascalientes, Baja California Norte, Baja California Sur, Chihuahua, Coahuila, Colima, Durango, Guanajuato, Guerrero, Jalisco, México, Nuevo León, Querétaro, San Luis Potosí, Sinaloa, Sonora, Tamaulipas and Zacatecas), Puerto Rico (alien).

**Oceania:** Australia (alien) (New South Wales, Queensland, South Australia).

*Note:* In Israel, *A. confertiflora* began to spread in the Shechem area in central Samaria during the mid-1990s. It is now widespread in Samaria, especially along roads and in cultivated areas, but also in Nature Reserves such as wadi Qana. The plant spread westwards and is now present in the Emek Hefer area (Sharon region), where 480 ha of riverbanks along the Alexander river are already heavily infested. The plant also spread eastward along wadi Tirza and has reached the Northern Jordan Valley. Additional foci were recently discovered along the Yarkon River, on the Carmel mount, in the Haifa region, in the southern part of Yizre'el valley in lower Galilee, and in the south near Gadera and in the Ashdod area.

In Australia, the species was introduced into Queensland in 1950 and is confined to small colonies in the western Darling Downs and the Burnett Pastoral District. In New South Wales, populations occur on the Far Western and North Western Plains and on the Central Western Slopes, while in South Australia the species is only recorded in the surroundings of Adelaide.

The species has been reported as present in the Dominican Republic (alien), but this could not be confirmed.

## Morphology

*A. confertiflora* is an erect perennial herb reaching 75-200 cm high, forming large stands from creeping runner-like roots that are part of a very dense root system concentrated in the upper soil layer extending down to a depth of 30 cm.

It has grey-green, bipinnate, fern-like leaves, 12-16 cm long and 10-15 cm wide. Flowers are yellow-green, and the species is monoecious. The female florets, without petals, form 1-flowered head, 5 mm long and 4 mm wide, clustered between the base of the upper leaves and the stems, and surrounded by a ring of spiny bracts. Male flowers are numerous and small, 1 cm in diameter, they consist of shortly stalked hemispherical heads (made up of many tiny male florets) which are grouped into

branching spikes at the ends of the stems. In the male flowers, the bracts are not spiny and they are fused together. Fruits are achenes covered with 10-20 short, hooked spines, each containing one seed. The seeds are brown, woody, 3-4 mm in diameter.

### **Biology and ecology**

*A. confertiflora* generally forms very dense stands and outcompetes many other plants. It reproduces from seeds and through vegetative propagation. The seeds germinate in autumn and the roots and runners are established during winter. Growth increases in spring and flower stems are produced in early summer. Flowering begins in mid-summer and continues until early autumn. The numerous spiny seeds are dispersed when they stick to the fur of mammals. Dispersal can also occur by flowing water, particularly during floods. Vegetative reproduction happens through adaptive buds found on spreading horizontal roots. The plants can renew themselves five weeks after mowing. The plant spreads very fast both vegetatively and through seeds and is considered to have the fastest rate of spread among land invasive alien plants in Israel. Aerial growth dies back in autumn.

Low winter temperatures, such as those found around the Mediterranean basin, do not seem to affect the plant's survival.

### **In which habitats**

*A. confertiflora* occurs in various natural and disturbed habitats, including dry plains and semi-arid valleys, run-down pastures, cultivated orchards, avocado and date groves, along roadsides, river-banks, and wadi beds, in wastelands and other disturbed areas. According to the CORINE land cover classification, the following habitats are suitable for the plant: arable land, pastures, sclerophyllous vegetation (e.g. garrigue, maquis); inland wetlands (marshes, peat bogs); banks of continental water, riverbanks / canalsides (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**

*A. confertiflora* can spread naturally over short distances through creeping roots. The seeds can also be spread over long distances when the hooked spines attach to livestock and wild animals, or can be spread by water, especially during flooding, as the woody burr floats.

The plant is spread through human activities when seeds attach to clothing and other fibrous material (e.g. tents). Root fragments may also be spread over long distance as a contaminant of machinery and vehicles, in particular agricultural machinery. It is unknown how *A. confertiflora* arrived in Australia. Seeds of the species are suspected to have entered Israel as contaminants in seed mixes imported from the United States for feeding birds and pond fish.

### **Impacts**

*Ambrosia confertiflora* forms very dense stands. The plant is also a serious pest in cultivated fields, citrus groves and orchards in general, competing for nutrients, interfering with the harvest. In addition, the plant is unpalatable to stock and excludes other pastures plant and can therefore reduce carrying capacity. The burrs of the plant contaminate wool and can lower its value.

The plant radically modifies the vegetation cover and consequently the whole ecosystem, readily suppressing understory native plants which results in

environmental impacts, in particular in humid habitats and in pastures. As with the other *Ambrosia* species, *A. confertiflora* produces a large amount of pollen considered to be severely allergenic, causing hay fever and contact dermatitis in susceptible people, although no report on this allergenic effect were found in Israel. The plant also invades gardens and parks and is reported to disrupt their maintenance.

### Control

*A. confertiflora* is not effectively controlled by cultural practices. In fact, cultural practices usually makes the infestation worse by spreading pieces of the perennial root and stimulating development of root buds. Mechanical control can even exacerbate the intensity of the invasion, as the plant regenerates very quickly after mowing. Uprooting may only be effective against very young plants as otherwise, the root remains in the soil and the plant regenerates. A study conducted in Israel showed that natural vegetation restoration along river banks with *Arundo donax* and *Arundo mediterranea* (Poaceae) successfully prevented *A. confertiflora* re-establishment in previously infested areas.

Herbicides such as glyphosate, triclopyr, and fluroxypyr are not very effective as the plant recovers quickly after the spraying. However, these herbicides are not registered for use in wetlands and riparian habitats. Though, herbicides have been recorded as providing satisfying results in controlling *A. confertiflora* in pastures in Australia. A recent experiment in Israel suggests imazapyr is effective in killing mature specimens of the burr ragweed.

No biological control agents have been tested so far against this species.

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Source: EPPO