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**INVASIVE ALIEN SPECIES OF VASCULAR  
PLANTS IN BULGARIA**



# *Robinia pseudoacacia* L.

## False-acacia

### Fabaceae – Pea family

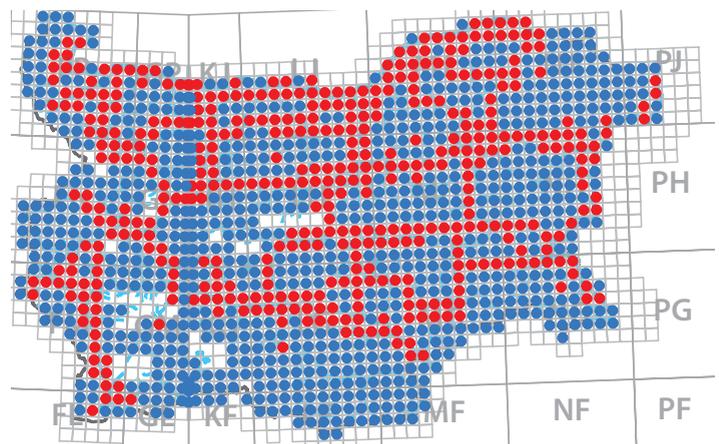
■ Included in List of “Worst invasive alien species threatening biodiversity in Europe” (Annex 1. 2007) and in the list of the invasive species of the European and Mediterranean Plant Protection Organisation (EPPO 2012).

#### Morphological description

Deciduous tree, to 15–20(30) m high, with dark brown, furrowed bark. Leaves alternate, imparipinnate, with 5–30 cm long rachis; leaflets 3–10 pairs, elliptic or ovate, entire, sparsely puberulent to subglabrous, shortly petiolulate. Young twigs at the base of the leaves with two big, sharp spines (modified stipules), which later fall out. Inflorescences 15–20 cm long, pendent racemes, hairy, many-flowered, axillary, usually shorter than the leaves. Pedicels 8–10 mm long, densely hairy. Calyx 5–6 mm long, 5-lobed, bilabiate to 1/3 of its length, campanulate, hairy. Corolla 15–20 mm long, zygomorphic (consisting of a standard, wings and a keel), white. Fruit a legume, oblong to linear, strongly compressed, 3–5(10)-seeded, glabrous, dark brown, dehiscent. Seeds 4–5 mm long, reniform, dark brown to blackish, smooth.

#### Biology and ecology

Pollinated by insects, mostly bees; blooms from May to June; fruiting abundantly in September–October, the fruits ripen in the autumn, remain on the tree and are dispersed during the whole winter. Propagated by seeds and vegetatively – by basal shoots and suckers. Once established on a new territory, the species rapidly spreads and forms dense groups by means of vegetative reproduction. The latter is further stimulated if the aboveground part of the tree is destroyed. Seeds are spread by gravity and by wind over long distances and retain their viability for over 10 years.



The trees begin fruiting at the age of about six years; fruiting is most abundant between 15 and 40 years of age and terminates at the age of about 60 years. Seedlings grow quickly and occupy large territories by root suckers. This leads to the formation of dense, mono-dominant communities, completely inhibiting the development of the natural vegetation. It grows in a wide range of habitats and is one of the most tolerant woody species to any type of soil and climatic conditions. It grows equally well on aerated, deep, light, fresh and fertile soil, rich in minerals and humus, as well as in poor, dry, sandy, stony and rocky places. The species is nitrogen-fixing and can fix the atmospheric nitrogen due to symbiotic relationships with nitrogen-fixing microorganisms, and therefore, it can grow on very poor soils. At the same time it increases the fertility of the colonized habitats



that affect their floristic composition, reducing the species preferring poor in nitrogen soils. Often the taxon occupies heavily disturbed habitats. It grows well on protected from strong winds locations. The species is used as an ornamental, as melliferous plant with significant importance for beekeeping, as well as for erosion control and soil stabilization. Wood is used in carpentry. The leaves, seeds and bark are toxic to humans and animals. The species does not tolerate very low temperatures.



This is a dangerous invasive alien species, occupied vast areas of the country, which has led to suppression and destruction of the native flora and vegetation, and to loss of natural habitats.

### **Origin and distribution**

Native to North America.

In Bulgaria it was introduced for cultivation in private gardens in mid-19<sup>th</sup> century, but after 1888 its cultivation increased rapidly through-

out the country as an ornamental in parks, gardens, alleys, avenues, and even then it was regarded as one of the most common deciduous tree species. The first report for its escaping from cultivation and penetration in natural habitats is from 1903.

The idea of rapid and widespread afforestation with false-acacia of disturbed and abandoned lands in late 19<sup>th</sup> and early 20<sup>th</sup> century, the high technical quality of the wood and the fast growth of the species are

the factors that guided the foresters at that time for its wide cultivation. Consequently its cultivation decreased, but the species was already widespread in natural and semi-natural habitats and continued to occupy new territories.

The species is widespread in all floristic regions of the country – along roads, railroads, cemeteries, almost everywhere in the lower forest zone, up to about 1000 m a.s.l. At higher elevations it is often damaged by low temperatures.

In Europe it was introduced in 1638 and subsequently spread throughout the continent. Outside Europe, it was introduced in Asia, Africa, Australia.

### **Control**

Once established on a territory, it is very difficult, if not impossible, to control the species. To limit its spread mechanical and chemical methods can be used. Repeated cutting for several years leads to gradual depletion of the trees. Most effective is chemical control with glyphosate. Trunks are cut close to the ground and the fresh cuts are treated with glyphosate. The newly formed shoots and



suckers should be removed periodically, and the chemical treatment should be repeated at least twice in a growing season. Herbicides have a greater effect if applied in late spring just as the leaves are fully developed.

Burning is not recommended to limit the spread of the species, since it is inefficient – the aboveground parts of the trees burn, but this is followed by rapid and massive growth of basal shoots and root suckers. Moreover, fires stimulate germination of the seeds accumulated in the soil and create conditions for massive growth of seedlings which is also facilitated

by the destroyed vegetation cover (no competition).

### References

Bartha & al. 2008; Başnou 2009; Bossard & al. 2000; Dimitroff & Stefanoff 1928; Kovachev 1903; Kuzmanov 1976; Nedyalkov & Marinov 1956; Weber 2003.

