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Invasive black locust tree can have sustainable future despite biodiversity impacts

The black locust tree can be economically valuable and offer certain environmental benefits, but its dominant and invasive nature in Europe can have an adverse impact on biodiversity. A recent study, which presents an overview of this species' ecological and socio-economic impacts in Central Europe, recommends tolerating the tree in some areas and eradicating it in others, in order to balance its co-existence with people and nature.

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The black locust (*Robinia pseudoacacia*) was first introduced to Europe from North America in the early 17th century and has become part of our cultural and ecological landscape. A fast-growing, pest-resistant tree with attractive flowers, it was planted for both ornamental and commercial forestry purposes. However, it is considered highly invasive; according to the Pan-European Ministerial Conference on the Protection of Forests in Europe, the black locust is the most problematic invasive forest tree in Europe and covers half of the total forest area designated as dominated by an invasive tree species.

Drawing on a wide range of previous research, this study presents the first ever summary of the black locust's ecological and socio-economic impacts, focusing on impacts in Central Europe. Despite describing the tree as both 'beloved' and 'despised', the study suggests that, with careful management, the black locust could have a sustainable future in which it brings economic benefits without causing undue environmental harm.

It is currently planted across most of Europe, excluding the north and some Mediterranean islands. In Central Europe, it is most widespread in Hungary, where it makes up 24% of all forests, followed by Slovenia and Poland, where it represents 4.7% and 3.4%, respectively, of forests.

The species produces valuable water- and rot-resistant timber and firewood, and provides nectar for making high-quality honey. In Hungary, it provides 25% of all timber and around 25 000 tons of honey a year — this represents 40–50% of all *Robinia* honey production in Europe. It can also be used to control soil erosion and improve damaged sites; it is able to tolerate both toxic and extremely dry soils and can rapidly take over mining areas, abandoned farmland and fire-damaged sites, as it thrives during early stages of forest regeneration. The tree's tolerance of poor-quality land also makes it popular in cities as an ornamental plant.

Evidence shows that, when replacing native vegetation, the black locust reduces local biodiversity, with comparable impacts to those of knotweeds (*Fallopia* sp.) and giant hogweed (*Heracleum mantegazzianum*), two notorious invasive plant species. Many studies have shown that in some environments it threatens endangered light-demanding plants and invertebrates by reducing light to plant life growing beneath the canopy and above the forest floor, and changing the microclimate and soil quality. These impacts can have knock-on effects throughout the food chain, for instance, by depriving birds of their insect prey, which depend on the plants that have been wiped out by the black locust.

However, the black locust's impact varies significantly according to the local environment. Some other studies show no significant impact and suggest that it can even offer benefits. On intensively farmed land, for example, clusters of *Robinia* increase biodiversity, provide shelter for many plants and animals, and serve as corridors for wildlife movement.

Governmental attitudes towards managing the black locust vary significantly between countries, with some actively promoting its economic use. However, economic considerations should not overrule the need to prevent negative effects on endangered species, the study states. Optimal management, therefore, has to be based on a site-specific approach, leading to tolerance in some areas and strict eradication at other, valuable sites.

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