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BLACK LIST

AIPS (Alien Invasive Plant Speceies) which are endangering indegenous plant species.

Green ash (*Fraxinus pennsylvanica*)

In the 1920s green ash was thought to be the most suitable tree species for the afforestation of alkaline soils. However, as it does not produce a suitable amount and quality of timber, it was later used to transform willow-poplar floodplain forests, and was planted into the second canopy level of riparian hybrid poplar forests. Nowadays green ash is a common tree species in all regions of Hungary except for our mid-mountains; its occurrence mainly concentrates around river valleys, wetlands and saline areas. Due to its fast growth, relatively low soil nutrient requirements, allelopathic effect and its low number of pathogens and pests, green ash has become an invasive species.

False indigo (*Amorpha fruticosa*)

False indigo used to be planted mainly for forestry purposes, specifically for soil protection and improvement.In the period after the First World War it became quite widespread along the Danube and Tisza rivers. Its spread was further accelerated by the decline in riparian grazing, the abandonment of arable lands and increasingly more frequent floods. Today false indigo occurs in large numbers, primarily on plains, along water courses and channels, in gallery forests and hybrid poplar forests, and in wet meadows. Introduced stands can be found in dryer sites, aswell, particularly on sandy or alkaline soils. Its establishment and spread is facilitated by its seed longevity and effective seed dispersal, which is mainly by water, river sediment and birds. It has a relatively short lifespan but begins production quite early.

Black locust (*Robinia pseudoacacia*)

Black locust is one of the most important forestry species in Hungary and has very high economic significance, covering the largest part of forested areain the country: based on 2010 data black locust occupies 457 000 ha-s in Hungary, or 23.9% of all forested areas. Cultivation of the species is facilitated by its quick growth, relatively strong drought resistance, moderate nutrient demand and good vegetative regeneration capacity. It produces excellent firewoodand serves as a versatile timber for the wood industry. In the past black locust was widely used in the fixation of shifting sand ravines and in the afforestation of mountainsides and hillsides. Nowadays, it also plays a role in the re-cultivation of overburden dumps and spoils. The very same characteristics that make black locust an excellent species for cultivation and regeneration also make it very dangerous from the point of view of nature conservation. Once the species has been introduced to, or spontaneously starts to grow in, an environment, it becomes increasingly diffi cult to remove it due to its excellent sprouting capacity both from root and stem, and its persistent seed bank.

Black pine (*Pinus nigra*)

The introduction of black pine to Hungary began at the end of the 19th century, primarily in our hills and midmountains, mainly on dolomite barrens. The main objective of their introduction was to stop erosion and protect the soil. At the beginning of the 20th century, introduced stands of black pine covered increasingly large surfaces of the sandy areas of the Great Plain; its largest populations can still be found in the Danube-Tisza interfluve. Black pine adapted well to the hot dry habitats unsuitable for many other tree species, so its introduction became increasingly important for timber production purposes, as well. Today around 3.6%of forested area is covered by unmixed stands of blackpine. Due to the closed canopy level and winter-persisten tfoliage, dense stands of black pine create extremely poor light conditions, where species of the former vegetation are unable to survive, and these slowly disappear from the herb layer.

Black cherry (*Prunus serotina*)

Black cherry was introduced in Hungary to the lower canopy layer of cultivated forests of sandy areas, to scots pine and black pine forests, and to black locust and hybrid poplar forests in order to improve these sites and support the growth of the primary tree species. Owing to the large scale introduction projectsin the 1960s, the species was able to reach many disturbed and semi-natural areas, chiefl y through dispersion by birds and small mammals. Although it occurs in wet habitats, gallery and alluvial forests as well,

black cherry primarily spreads in sandy forests. Its occurrence concentrates around sandy areas, where it appears in massive numbers both in seminatural and plantation-like forests. Alongside thebiological characteristics of black cherry, the disturbance of sites also facilitates the spread of the species.

Russian olive (*Elaeagnus angustifolia*)

Russian olive in Hungary has been primarily introduced in order to aff orest alkaline soils and diff erentruderal soils and ruderal areas; but it has also beenextensively used in forest edges, wind-breaks, shelter-belts and hedgerows, as well. The species can befound primarily on plains in Hungary; it rarely appears in the mid-mountains. Its spread is discernible in several different habitats, from loose sandy soils and alkaline soils to wet meadows and habitats along rivers and channels. The establishment and spread of Russian olive is largely facilitated by its good nitrogen-fixing and regenerative capacity, and its broad temperature and moisture tolerance. Its seed dispersalagents include several species of birds and small mammals, but water dispersal is also possible. Due to its appearance in treeless habitats, species with high light requirements can be locally forced out; its nitrogen-fixing actinomycete fungi can accelerate thespread of nitrophilous weeds, all of which can leadto the suppression of many rare and protected plantspecies.

Common lilac (*Syringa vulgaris*)

Common lilac has been planted all over Hungary foraround two hundred years, and due to its popularity itcan be found in many urban and rural gardens. Planted stands usually reproduce with root suckers and appear near settlements at forest edges, with shrubs, inforest strips, vineyards, and areas with small parcels, and along roads. Wild populations are found in our mid-mountains in dolomite and limestone habitats, as well as in loess and sandy habitats on the plains. It is characterised by good seed germination capacityand moderately fast vegetative growth. Common lilac spreads effectively owing to its excellent regenerative capacity: it is capable of growing sprouts easily from both the stem and root. It is a drought-tolerant species with high light and temperature requirementsand an extensive, rich root system. It also grows well in polluted urban air conditions.

Tree of heaven (*Ailanthus altissima*)

As a result of deliberate planting and spontaneous spread, tree of heaven has been an established tree species in middle Europe; today it can be found almost everywhere in hills andfl atlands with a warmer climate. Those characteristics that initially were positive from the point of viewof introduction have largely facilitated its invasion and made it an invasive species that causes one of the gravest nature conservation problems in central Europe. The tree can easily be propagated by seed – its seedlings are easy to cultivate and grow quickly – and itis characterised by remarkable root suckering ability, which all originally supported its widespread introduction. Being also a good nectar producer, it is sometimes cultivated intentionally. Its primary root grows deep, the lateral roots fan outward close to the surface, some of these serving as storage organs. Adventitious shoots forming on the roots facilitate the development of a thick growth of suckers around the base and quick vegetative reproduction. Nature conservation issues caused by tree of heaven can be explained primarily by the species' capability for effective vegetative reproduction. In addition, it also reproduces generatively, bearing abundant fruits almost every year.

Common hackberry (*Celtis occidentalis*)

In the last century common hackberry has been introducedto enrich the second canopy layer of cultivatedforests, black locust stands, hybrid poplar forests,and Scots and black pine forests. It tolerates wellthe dry, warm polluted air of urban areas, as well asregular pruning and road salting, which make it oneof the most frequently planted alley trees. Nowadays, it mainly spreads in riparian and sandy areas, andalso appears in suburban forests, tree alleys and settlements. It is only rarely found in hills or mountains; rather its occurrence is concentrated on the plains. Young trees are fast growing. The root system of the common hackberry is richly branched and extends sometimes as deep as 3–6 metres into the soil; thus it can survive in dryer habitats.

Common milkweed (*Asclepias syriaca*)

The spread of milkweed in Hungary was significantly accelerated by its intensive cultivation between 1870and 1950. The species was considered to be utilisable in a wide array of different ways: its flowers were used to produce volatile oil, syrup and wine, its fibres to produce paper and wallpaper, its latex in rubber production and seed in silk production, and its shoots were consumed as "asparagus". Nowadays, it is realizedas having practical significance only as a nectar producer, so previously established stands have been abandoned and have started to spread quickly via rootsuckers and through the hairy seeds that aid wind dispersal. Its spread is

intensified in disturbed habitats with loose soil, from dry, open sandy grasslands to wet riparian habitats. The colonisation of new sites is facilitatedby its wind-dispersed seeds having long seed longevity, strong competitive capacity and drought tolerance. Owing to its rhizome-like root systemit forms large clones. The majority of its thick roots grow laterally and close to the surface, but some can extend as deep as 1–1.5 metres.

Giant and Canadian goldenrod (*Solidago gigantea, Solidago canadensis*)

The giant and Canadian goldenrod species were introducedto Hungary in the mid-1800s as ornamentals. The spread of giant goldenrod has been more intensive and aff ects a bigger part of the country. Giant goldenrod is common in most parts of the Transdanubianregion, and occurs mainly along streamsand in river valleys in the mid-mountain sand. Canadian goldenrod,on the other hand, is less common, and appears in larger stands mainly along the Transdanubian andnorthern mid-mountains near big cities. Both speciesare geophytes growing from rhizomes; the rhizomesof Canadian goldenrod are shorter but live longer, meaning that its stands are usually smaller,with higher density. They can establish in new habitats with the help of their pappus on wind-dispersed cypselas, then densely populate it with rhizomes and create mono-dominant stands. Both species have high light requirements and relatively broad toleranceas far as the supply of nutrients is concerned; however, their site-preferences are slightly different.

Wild cucumber (*Echinocystis lobata*)

Wild cucumber was probably introduced to Hungaryas an ornamental plant, and thanks to its rapid spread it had already been considered an established speciesby the 1950s in the western and south-western Transdanubian regions and in the Hungarian mid-mountains. Nowadays, it can be found almost everywhere in the country, but it is relatively rare in the Little Hungarian Plain and the Danube-Tisza interfluve. It appears in masses mainly in riparian areas and floodplains, in gallery forests, alluvial willow scrubs, and in tall riparian weed communities. Besides these habitats, it may also establish itself in streamside tall herb communities in hilly and mountainous areas and in semi-humid, wet forest habitats. Its seeds and fruits(which float on the surface of the water) can be dispersed over long distances by the current. As seed dormancy is broken by exposure to cold winter weather it quickly germinates in moist, nutrient-rich soils.