

The Problem:

North American Native Plants That Invade Slovakia and Central Europe

By Daniela Michalkova

During the year of my internship at Cuyahoga Valley Environmental Education Center (CVEEC) I tried to get to know some of the North American native plants. The climate of Ohio is approximately the same as that of Slovakia, but the plants are very different. I fell in love with the tulip trees, red maples, sassafras and sycamores that surrounded me in Ohio. In Europe, I was accustomed to seeing these trees only in botanical gardens and parks. But I also found in the United States a group of plants I knew very well. For example, purple loosestrife, garlic mustard, Queen Ann's lace, Canada thistle, and others. I was surprised that these "peaceful weeds", as I knew them from my home in Slovakia, are considered to be invasive in the U.S.

As an environmental educator at CVEEC, I taught the students about a great threat to wild life – the so-called invasive species. Having had the experience of fighting invasive plants outside the North American continent, I tried to teach my students that the problem of invasive plants is a global problem affecting large areas in Slovakia, and in Europe as well. Invasive non-native species threaten the native biological diversity by displacing native plant species.

A great many plants invasive to Europe come from North America. The most dangerous and aggressive invasives native to the U.S. belong to Composite family (Asteraceae). There are 8 genera with about 17 species, which are invasive to Slovakia and Central Europe in general. Some of them might rapidly spread even in their native areas in the U.S. In this article, I would like to tell you more about 4 of these invasive genera and about the control management strategies we use in Slovakia.

Aster (Aster)

Very unpleasant invasive plants belong to a genus Aster. There are about 6 species and their hybrids that invade Slovakia. They came mainly from the eastern part of North America and were introduced to Europe as decorative species for horticulture in 19th century. Later, they escaped from the gardens



Aster novi-belgii

and spread into natural areas.

One of the most invasive of the Asters is New York Aster (*Aster novi-belgii* L.). This plant is 2 to 4 ft. tall. Its leaves are about 3 in. long, narrowly lance-shaped and slightly clasping the stem. It blooms from August until October. The flowerheads are 1 – 1 ¼ in. wide, rays are purple and the central disk is yellow. The New York Aster sexually (generatively) reproduces by seeds and non-sexually (vegetative reproduction) by underground stems called rhizomes.

The New York Aster grows usually at lower altitudes in lowlands and hilly areas. It tolerates a wide range of environmental conditions and quickly colonizes recently disturbed sites. The species spread rapidly along the rivers. It is not unusual to see large and dense growths of the New York Aster on the riverbanks and on the road sides.

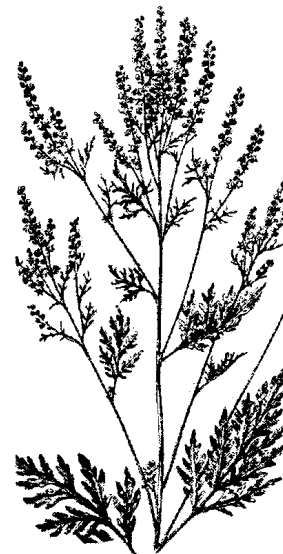
Ragweed (*Ambrosia*)

Ragweeds are annual plants that grow all around the United States. The non-native Giant Ragweed (*Ambrosia trifida* L.) also grows infrequently in eastern Slovakia and in the future might become a large invasion.

The Common Ragweed (*Ambrosia artemisiifolia* L.) is already invasive to Slovakia. It is very common in the warmest, southern part of the country. It grows in fields, waste places, junkyards and railroad embankments. The hairy branching stem is 1/3 – 6 ft. tall. Leaves are divided into narrow toothed or lobed segments. Greenish male flowerheads are borne in slender spikes. Female flowers are in clusters at leaf bases. The Common Ragweed blooms from August until October. An average plant produces about 2,000 seeds.

Ragweeds are known for the problems they cause among hay fever victims. The drab male flowerheads release vast quantities of pollen into the air. Each grain is covered with minute hooks, so it clings to the bronchial tissue of humans and causes bad allergies.

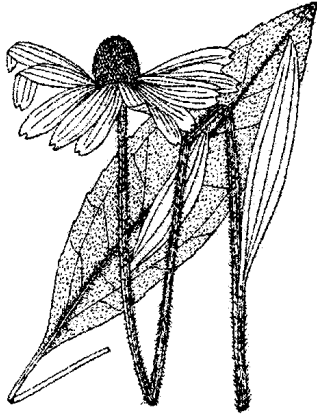
Experience shows that the most effective control is the mechanical removal of the plants before blooming



Ambrosia artemisiifolia

to avoid seed production. In smaller areas hand pulling is successful and in larger areas, it is common to mow the invasive plants.

Coneflower (*Rudbeckia*)



Rudbeckia hirta

Who would expect that even the pretty Black-eyed Susan (*Rudbeckia hirta* L.) is an invasive species! It was brought over to Europe, together with Tall Coneflower (*Rudbeckia laciniata*, L.), from the U.S. for decorative use in gardens. These perennials have escaped to the wild and displaced

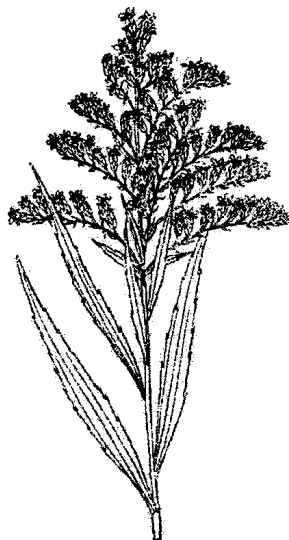
the native vegetation. They grow in a wide range of environments and prefer moist areas. Especially the Tall Coneflower grows rapidly along the rivers, reservoirs, lakes and railroad embankments because the water movement and busy railroad traffic helps seed dispersal.

The Tall Coneflower is up to 8 ft. tall. Lower leaves are pinnately divided into 3-7 irregularly lobed leaflets. Flowerheads are 2 ½ - 4 in. wide. The rays are yellow and the central disk is a brownish-yellow knob. The flowers bloom from July until October.

Goldenrod (*Solidago*)

Canada Goldenrod (*Solidago canadensis* L.) and Late Goldenrod (*Solidago gigantea* Aiton) are common species of North American Goldenrods and are invasive to Slovakia. They were introduced to Europe as decorative and honey-producing species.

The Canada Goldenrod and Late Goldenrod look very similar. The leaves are narrowly lance-shaped and sharply toothed. The yellow flowerheads are in dense, arching clusters. The Canada Goldenrod is 1 – 5 ft. tall. The main stem is smooth near the base and downy above. The individual tiny flowers are 0.5 mm (1/50 in.) in diameter. The Late



Solidago canadensis

Goldenrod is 2 – 8 ft. tall. The main stem is smooth and grayish-green; the base is reddish. The flowers are 1 mm (1/25 in.) in diameter.

Both species are extremely effective colonizers due to their growth habit as well as high seed production. In addition to the seeds, the Goldenrods also reproduce non-sexually by rhizomes. They colonize moist or dry open places, disturbed and idle sites, waste places, roadsides, railroad embankments and fields.

Methods of control

After having established successfully, these invasive plants are able to dominate the sites for decades and replace the native species. In the process of protecting our native biodiversity, it is necessary to invest a lot of effort to control the invasives.

Slovakia as a member of the European Union has incorporated the control of invasive plant species in its legislation. The Slovak National Council has laid down an Environmental law no. 543/2002 that facilitates the protection of national biodiversity. In 2003 the Ministry of Environment of Slovak Republic designed the Edict no. 24 with a list of invasive plant species and methods of their control. The invasive species are controlled by the Slovak National Park Service that cooperates with the owners of the properties.

The Slovak NPS uses different control methods depending on the kind of propagation of a target invasive species and the population size. The most common is mechanical control. Initially, people control the annual and biennial invasives by preventing the plants from producing seeds. It includes physical removal such as cutting, hand-pulling and mowing plants before blooming. It has been shown to be effective to graze the sheep and cattle in areas with sparse growth of invasive plants. This method does not destroy the invasive population completely, but it helps decrease its vitality. The invasives with the generative as well as vegetative reproduction (Asters, Coneflowers, Goldenrods) are also controlled mechanically by ploughing flat and large areas. The seeds of some native plants that can out-compete the invasives have to be sown in the disturbed soil. Without this step the invasive species will quickly re-establish from the root fragments. Fire is not a common method, because it could harm the non-target plants and animals that are part of the ecosystem.

When other control methods are ineffective, it is appropriate to use herbicides. The chemical control is a good solution during late stages of invasion when the populations are large and well-established. Synthetic herbicides are applied to the above-ground part of the

plant. It is necessary to only use herbicides that do not contaminate soil or surface and ground waters. The brands of herbicides used in Slovakia are for example, Roundup – Biaktiv, Glialka 36, Rodeo, Garlon 4, etc.

Biological methods are not very popular in Slovakia. The use of the natural enemies of the invasive species to reduce its population appears to be a smart idea, but introducing of a non-native predator to an ecosystem is very risky without knowing all of the potential hazards. Intensive research is necessary in this area.

The environmental methods are very interesting. They prevent the creation of environments that could possibly be colonised by the invasive species by restoration of disturbed and idle sites, junkyards, and waste places through cleaning and replanting with native plants to avoid further invasion. This preventive method is very difficult considering the needs of the environment we live in.

It shows to be most effective to use the combination of all the available control strategies. A proper timing of follow-up treatment is necessary.

Conclusion

Everyone who has ever tried to control the invasive species knows it is a hard work. It sometimes feels as if we are fighting in vain like “tilting against wind mills” but it is not in vain, even if complete eradication of invasive non-native plants from a site is not possible. The protecting of the biodiversity in its local beauty is the most important goal we try to achieve. The invasive species are now really a global problem, and therefore, it is valuable to share our experiences and help each other to reach our mutual goal.

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About the author

Daniela Michalkova lives in Slovakia, Europe. She has been fascinated with nature and plants since her childhood. As a girl scout she has learned how to use the medicinal plants and she would change her favorite self-made herb tea for no other drink!

Daniela received her master's degree in botany from the Comenius University in Bratislava. In the school year 2003 – 2004 she worked at the Cuyahoga Valley Environmental Education Center in Peninsula, Ohio. The Cuyahoga Valley Center is a sister center to the Slovak ecological organization DAPHNE, Daniela's former employer. She has recently begun her PhD. studies in botany at the Slovak Academy of Science in Bratislava, Slovakia.