P28

How to tackle with invasive plant species and sustainable energy production

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Abstract

The changing environment and climate pose several challenges for us. Climate-friendly solutions are needed for energy production, and invasive plants are rapidly invading man-made areas. Roadsides and untapped areas could provide (zero-emission) biomass for energy and fertilizer production, but also an effective control site for certain invasive species. Species such as *Lupinus polyphyllus* are mainly spread through roadsides and the IAS management plan focuses on mowing as a control method.

Most promising method for limiting garden lupin by roadsides has been shown to be mowing as roadsides are regularly mowed for safety. Continuous mowing can restrict plant growth effectively and reduce seedling production. Most effective result could be gained by timing mowing correctly. This has shown to be more difficult than expected. And quite often mowing has hardly any effect on restricting invasions as it´s done too late.

If plants are taken to biomass treatments with seeds, there is a species-dependent varying risk for their survival. Our studies checked seed survival through tunnel and windrow composting, BMP and farm-scale AD, laboratory stress experiments. Species that had physical, chemical or deep dormancy mechanisms were most likely to survive. These species were *Heracleum* sp., *Rosa rugosa* and *Lupinus polyphyllus*. Field experiments with mowing 1–3 times per growth season highlighted importance of early season mowing in restricting risk. But it revealed also weak points of mowing as a management type. Average production of these areas is about 27 TS (%ww). These untapped areas could anyway be brought to energy production and support the increase of distributed energy production.

P29

Camera-trapping in support of the control of Chinese muntjac in a suburban park in Belgium

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Abstract

Chinese muntjac (*Muntiacus reevesi*) is a small-sized deer of Asian origin. In the United Kingdom, a large population has developed that causes ecological and economic damage. To avoid a similar scenario on the European continent, Member States have included muntjac on the list of species of Union concern (Regulation 1143/2014). Indeed, muntjac is currently present in isolated populations only in a few countries.

We report on the species' status in Flanders (Belgium). Here, muntjac was increasingly observed throughout the region over the past decade. Genetic analysis indicates that many sightings represent independent releases and escapes. These introductions run parallel to the strictly enforced ban on muntjac. With the captive population now strongly decreased, the priority for management shifts to the control of feral populations.

By means of camera traps, we supported the attempted removal of a feral population in a public woodland park near the city of Antwerp. A network of traps was operated from December 2020 to May 2022, spanning two periods of control (in which high seats were staffed at morning and evening hours during winter).

The data show activity peaks at dawn and, particularly, at dusk, but also suggest a shift in activity during control. Despite intense management on a small surface area, only a limited number of animals were culled. This illustrates the secretive nature of muntjac, allowing it to thrive well in a suburban park with intense levels of recreation. It seems unlikely that current efforts will effectively eradicate the local population, although control may help to turn the population from a source into a sink.

To prevent muntjac from becoming a vertebrate pest at the continental scale, we call for an increased exchange of knowledge on population status across Europe. Sharing camera trap data also undeniably holds potential to increase the effectiveness of management.