CONTROLLING SWALLOW-WORTS THE SUSTAINABLE WAY

Locations  
Canada, United States

Dates  
01/01/2006 - Ongoing

Summary  
Swallow-worts (*Vincetoxicum nigrum* and *V. rossicum*) are Eurasian plants that have become invasive in North America. The overall goal of the project is to identify specific natural enemies that can be introduced to North America as biological control agents for swallow-worts.
The problem

Swallow-worts (Vincetoxicum nigrum and V. rossicum) were introduced from Europe into eastern North America around 1850 as ornamental vines and have since become naturalized. The current extent and potential further spread of swallow-worts is of great concern to land managers and farmers in North America. Studies have shown that monocultures of swallow-worts can cause wide-scale degradation of ecosystems. This, and the lack of effective ways of managing these weeds, has spawned interest in implementing a classical biological control programme.

Biological control seeks to introduce host-specific natural enemies to reduce the impact of invasive weeds. A guiding principle is that these agents should not damage other plants.

What we are doing

In 2006, a team from CABI’s centre in Switzerland and the University of Rhode Island, USA started surveying potential biological control agents that attack and are specific to swallow-wort plants in Western Europe and Ukraine.

Five potential insect biological control agents were selected for further testing: the leaf-feeding moths Abrostola asclepiadis and Hypena opulenta, the leaf-feeding beetle Chrysolina aurichalceia asclepiadis, the root-feeding beetle Chrysocochus (Eumolpus) asclepiadeus and the seed-feeding fly Euphranta connexa.

Results so far

The University of Rhode Island (URI) confirmed the narrow host range of H. opulenta and first releases were made in eastern Canada in 2014 and in the eastern United States in August 2017. Monitoring is ongoing.

In our studies at CABI, in collaboration with URI, C. asclepiadeus from Ukraine was able to develop on several native North American (NA) Asclepias species under no-choice conditions (offering one plant species at a time) and also occasionally attack the NA A. tuberosa and A. incarnata when Vincetoxicum was present.

Currently, no work can be conducted in Ukraine. So, we have re-started work with a C. asclepiadeus population from France. This population, which was tested to some degree by the European Biological Control Laboratory (USDA-ARS-EBCL), is different at a subspecies level from the Ukrainian population, but the host range seems to be very similar. In 2018, an open-field test was conducted at CABI Switzerland, exposing Apo. cannabinum, Asc. incarnata, Asc. syriaca and V. hirundinaria. Adult beetles, feeding and larval development were only observed on swallow-wort which indicates a narrow host range of the beetle under field conditions. With these encouraging results, we decided to proceed with the host range testing of the French population in collaboration with EBCL.

Euphranta connexa is only found on V. hirundinaria (white swallow-wort) in Europe. However, V. nigrum and V. rossicum also proved to be suitable hosts in our tests. Of the 20 non-target species tested so far, four received eggs under no-choice conditions. Work with E. connexa is challenging owing to the difficulties to synchronize the production of fruits on both test and control plants and oviposition of the fly. In view of limited funding, we are currently concentrating our work on C. asclepiadeus.

Donors

USDA-ARS, Ithaca, NY, USA, Agriculture and Agri-Food Canada (AAFC)

Partners

University of Toronto, Canada, Michigan State University, USA, Colorado State University, USA, USDA-ARS, European Biological Control Laboratory (EBCL), France, The University of Rhode Island, USA
https://www.cabi.org/what-we-do/cabi-projects/