



STEMMING THE SPREAD OF RUSSIAN OLIVE

Locations Canada, United States

Dates 01/01/2007 - Ongoing

Summary Russian olive is a significant invasive weed in North America but is perceived as a useful and attractive tree by some stakeholders. It is especially a problem in western parts of the USA where it affects many natural habitats, altering the ecosystem and its functions. Biological control is a useful approach in such circumstances because scientists can look for natural enemies that damage reproduction, and thus future spread, without damaging established trees.

The problem Russian olive (*Elaeagnus angustifolia*) was introduced to North America in the late 19th century as an ornamental plant, for erosion control, and as a windbreak and shade tree. It has become a significant invader of natural habitats, particularly along riverbanks, and to date has been classified as a noxious weed in four states of the western USA, a figure that is likely to increase in the near future.

Although Russian olive competes with native species and alters ecosystem functions, some still value it as an ornamental plant and windbreak. To avoid conflicts of interest, the biological control project for Russian olive is therefore concentrating on natural enemies that specifically attack the flower buds, flowers or seeds in order to slow its spread without harming established trees.

What we are doing CABI's centre in Switzerland and the Biotechnology and Biological Control Agency (BBCA, Rome, Italy) initiated surveys in Eurasia in 2007 to determine whether biological control by introducing natural enemies from Russian olive's area of origin was a feasible option. Out of 72 insect and mite species found associated with the tree in its native range, the shoot- and flower-attacking eriophyid mite *Aceria angustifoliae* and the shoot- and fruit-boring moth *Anarsia eleagnella* were prioritised for in-depth studies to assess their host range (ie. whether they could attack non-target plants if introduced in North America) and their impact on Russian olive.

Results so far

The host specificity of the mite, *Aceria angustifoliae*, was assessed in an outdoor experiment in Iran and at CABI's centre in Switzerland. Results suggest that *A. angustifoliae* has a very narrow host range and is likely to be restricted to Russian olive under natural field conditions. The petition for field release of *A. angustifoliae* was submitted to the USDA Animal and Plant Health Inspection Service (APHIS) Technical Advisory Group (TAG) and the Canadian Biological Control Review Committee (BCRC) in November 2019. The Canadian Food Inspection Agency (CFIA) did not approve release, despite the BCRC and TAG recommending release. Supplemental information was submitted to both TAG and the CFIA who has now granted permission for *A. angustifoliae* to be released in Canada under the authority of the Canadian Plant Protection Act and the scientists hope that field releases will take place by spring 2023.

The moth, *Anarsia eleagnella*, has at least two generations per year: the first attacks shoot tips, while the second feeds predominantly on the fruit and damages the seeds. No-choice tests and an open-field test in Iran showed that the host range of this species is wider than initially anticipated and appears to include several species within the family *Elaeagnaceae*. Work with this species is currently suspended.

Field surveys in Kazakhstan are ongoing to find additional potential biological control agents could not be continued in 2020 due to COVID-19 related travel restrictions. We hope to resume surveys in 2021 and hope to find the stem mining weevil, *Temnocerus eleagni*.

Donors

United States Department of the Interior (USDI) Bureau of Indian Affairs through MSU, USA, United States Department of the Interior Bureau of Land Management (USDI BLM) through MSU, USA, Ministry of Forests, British Columbia, Canada, Montana Noxious Weed Trust Fund through Montana State University (MSU), USA, Wyoming Biological Control Steering Committee, USA

Partners

University of Belgrade, Serbia, Biotechnology Biocontrol Control Agency (BBCA), Italy

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