



Media Release

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Combating Japanese Beetles with Fungi

In June of this year, the Japanese beetle (*Popillia japonica*) was detected for the first time in Switzerland, in the canton of Ticino. Considered to be a quarantine pest, it is subject to obligatory control. Agroscope researchers are testing whether this quarantine pest can be controlled with fungi that are effective against May and June beetles. Initial trials have been promising.

As its name suggests, the Japanese beetle originates in Japan. There it is preyed on by natural antagonists, which is why it seldom reaches pest population levels there. Around a hundred years ago, however, it set out to conquer the world, leaving its enemies behind. It was discovered for the first time outside its native habitat in the USA in the early 20th century. In the years that followed it quickly spread over the USA and Canada.



An entomopathogenic fungus grows out of a dead Japanese beetle. (Photo: Christian Schweizer, Agroscope)

A varied palate

Japanese beetle larvae are white grubs. Like their well-known European relatives, they live in the soil and feed on roots. Their preferred food source is most likely grasses and herbs in damp meadows, but Japanese beetle grubs have also been found in maize and soybean fields. The adult beetles are even less picky, and can feed on around 300 plant species, including tree species, ornamental plants and agriculturally important crops such as maize, vines, strawberries or tomatoes. Besides leaves, the beetles also consume the flowers and fruits of their host plants, thereby wreaking additional damage.

Fungi – effective against May and June beetles, ergo against Japanese beetles?

The Japanese beetle reached Switzerland in June of this year. Several specimens were caught in the canton of Ticino at the Italian border. In order to prevent rapid establishment and spreading of this quarantine pest, Agroscope experts Giseler Gra-



benweger and Franco Widmer are testing whether the Japanese beetle can be controlled via fungi that infect insects – so-called entomopathogenic fungi. This environmentally friendly method has been used successfully to combat the voracious grubs of May and June beetles and garden chafers. Agroscope has a great deal of experience in this field of research and maintains a large collection of indigenous fungal strains that are used to control various pests.

Promising lab results

All permits for an initial test for controlling Japanese beetle with entomopathogenic fungi were obtained in record time. Under strict safety precautions, beetles caught on Italian territory were brought to the Agroscope research station in Zurich and infected with fungi from the Agroscope strain collection in a cabin specially equipped for quarantine organisms. Within just a few days, nearly all of the Japanese beetles were dead. In a little over a week, fungal mycelium was already growing out of the beetle cadavers and starting to form spores (see picture). The Swiss fungal strains had no difficulty in developing on the non-native host insect in this laboratory assay.

There is still a long way to go, however, from these initial results to successful Japanese beetle control in the field. It remains to be tested whether efficacy of the entomopathogenic fungi against the beetles is comparable under field conditions, and feasible application methods have still to be developed.

Nevertheless, the use of entomopathogenic fungi would be an elegant approach to the biological control of the Japanese beetle. In 2018, Agroscope researchers will explore, together with the Swiss Federal Office for Agriculture, the canton of Ticino, and colleagues from Italy, whether this approach can be put into practice successfully.

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