How to fight biological invasions without compromising the aims of the European Green Deal?

Giselher Grabenweger, Sylvain Poggi, Nelson José de Oliveira Simoes, Leonardo Marianelli, Johannes Sauer

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IPM Popillia

Integrated Pest Management of the Japanese Beetle

www.popillia.eu

Detecting invasion

- Automated monitoring
- Citizen science
- Risk based surveillance strategy
- Phylogeography

Understanding establishment

- Interactions between invasive species and (soil) microbiome
- Reasons for success or failure of population establishment

Providing tools

- Biological and biotecnical control
- Low risk insecticides
- IPM-toolbox for *Popillia* control

Project team:

Agroscope

Pessl Instruments

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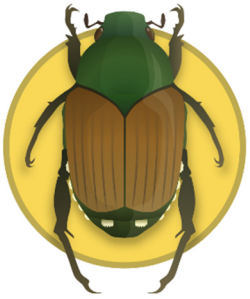
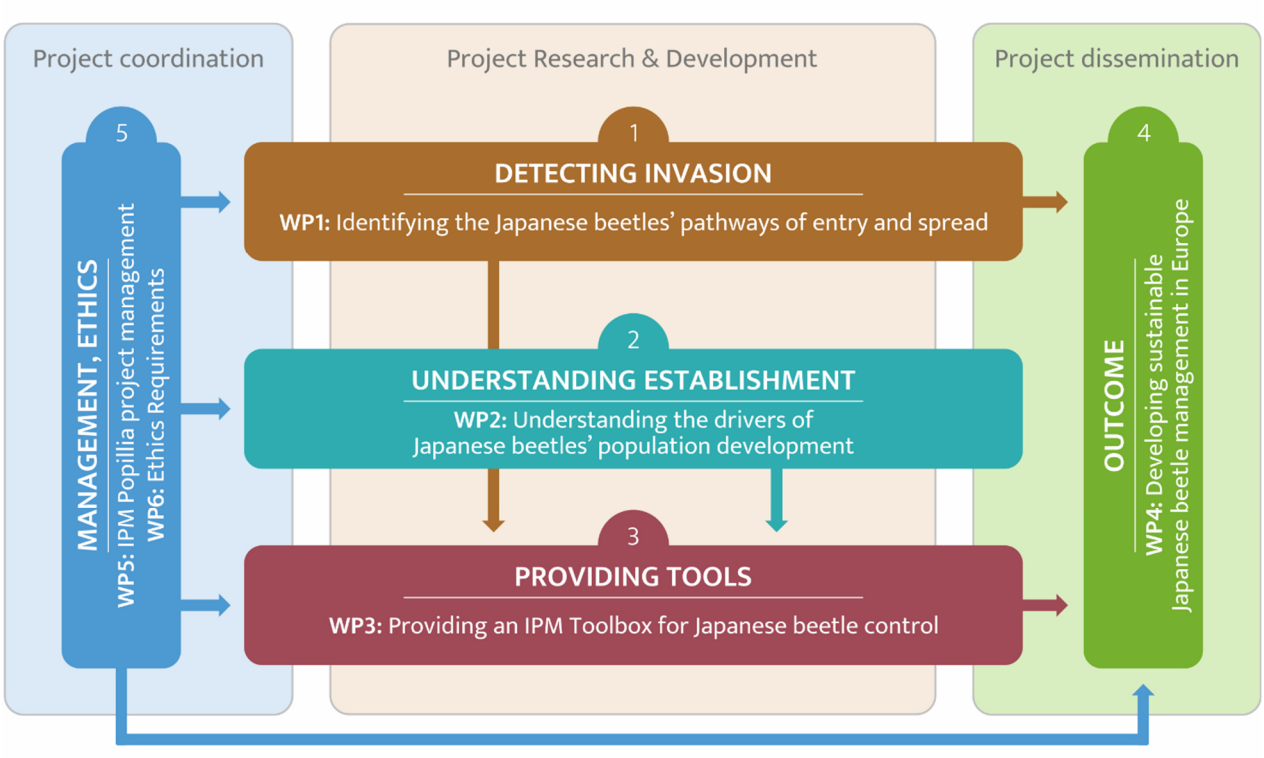


IPM Popillia

Integrated Pest Management of the Japanese Beetle

The invasion of the Japanese beetle, *Popillia japonica*, threatens the entire agricultural sector, urban landscapes, and the biodiversity in invaded areas. Climate suitability puts at risk an area ranging from the Atlantic to the Black Sea, and from the Mediterranean to Great Britain and Southern Scandinavia.

- IPM-Popillia will make detection, identification, and monitoring of the new pest faster, more efficient and less labour intensive
- IPM-Popillia will unveil the drivers and mechanisms determining success or failure of an invasive species' population development
- IPM-Popillia will provide an "IPM-Toolbox" for sustainable control of the invasive pest in Europe



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How to fight biological invasions without compromising the aims of the European Green Deal?

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Invasive Alien Species pose a risk to plant health in the invaded area. Depending on their ability to establish and their specificity to certain host plants, some species may threaten the entire agricultural sector, as well as the biodiversity in the invaded area. After their detection, control of invasive alien species usually faces two constraints: (1) The possibilities to restrict movement of goods and people, a main driver of further expansion, are limited, and (2) successful eradication of once established populations is impossible.
Against this background, it is paramount to develop measures, which confine the spread of the new pest, and prevent the build-up of high population densities that cause economic loss to agricultural crops. It is not a surprise that previous invasions have often triggered an excess use of pesticides for the sake of eradication or containment of an invasive alien species.

The Japanese beetle, *Popillia japonica*, is one of the worst invasive pests of North America. Costs to control the pest in the US exceed $450 million per year. *P. japonica* was detected near Milano in 2014, and is now starting to spread in Europe. It is an enormous threat to Europe, since (1) it can feed on more than 300 host plants, including many important crops, (2) it is a good flyer and can be relocated via movement of goods and people, (3) climate suitability puts at risk an area ranging from the Atlantic to the Black Sea, and from the Mediterranean to Great Britain and Southern Scandinavia. EFSA and the JRC of the European Commission nominated *P. japonica* a high priority pest in the EU Plant health Law.

Independent from any concerns about the effects of excess pesticide use on human health or the environment, it is clear that a conventional control strategy against the *P. japonica* invasion into Europe, relying on the heavy use of insecticides, will never reach its containment goals anyway. Reasons are that, in contrast to other agricultural pests, *P. japonica* oviposition sites and larval populations are mainly found in grasslands. In these habitats, insecticide use is banned or has been uncommon for decades. Furthermore, Japanese beetles are abundant where pesticide use is technically not feasible or socially not acceptable, e.g. in nature conservation areas, forest margins, small-structured, fragmented landscape, or close to residential areas and private gardens. It is therefore clear that a sustainable reduction of *P. japonica* populations can be achieved only with a control strategy that is applicable in these crop and non-crop areas.

The H2020 project “IPM-Popillia” has the aim to counteract the invasion of the Japanese Beetle in Europe. IPM-Popillia is outstanding with the concept to counteract the invasion of a quarantine pest exclusively by means of sustainable and environmentally friendly control measures. IPM-Popillia will adduce evidence that it is possible to fulfill the obligations of quarantine regulations, without neglecting IPM principles of the EU, as outlined in the Directive on the sustainable use of pesticides.

The presentation will outline the main areas of research and development within the project “IPM-Popillia”, which have been defined as the pillars of a successful IPM-Strategy against an invasive pest, and report on the progress made so far:

1. Identifying the Japanese beetles’ pathways of entry and spread

This work package aims to make detection and monitoring of the new pest faster, more efficient and less labor intensive. It will provide plant health services with an optimal surveillance strategy, and raise public awareness of the new pest.

2. Understanding the drivers of Japanese beetles’ population development

There is a range of biotic and abiotic factors, which play a role in success or failure of the establishment of an alien invader. It is a long-term goal of the project IPM-Popillia to contribute to the understanding of these factors from the gene to the ecosystem level.

3. Providing an IPM Toolbox for Japanese beetle control

A range of biocontrol options of larvae of the Japanese beetle in grassland soils and potting substrates, and of adult Japanese beetles in different crops, are developed and tested in this work package. In addition, measures must be suitable for application at sites with low and high pest abundance, respectively.

4. Developing sustainable Japanese Beetle management in Europe

The last work package goes one step further from development to implementation, and will examine economic and socioeconomic feasibility of the proposed IPM-strategy against *P. japonica*. Finally, it will focus on fast dissemination of the project’s results as customized information and policy advice for a sustainable Japanese beetle management in Europe.