INTEGRATED WEED MANAGEMENT IN EUROPE

Locations	Europe
Dates	01/06/2017 - 31/05/2022

Summary

Weeds are ubiquitous and cause substantial yield losses across all arable and horticultural land. The goal of this European-wide project is to optimise the efficacy, applicability and use of environmentally friendly weed control measures that can replace or complement current chemical control methods.

The problem

Integrated and environmentally friendly approaches to pest and disease management were adopted in Europe several decades ago, yet managing weeds continues to largely rely on herbicides. In the light of the European Knowledge Based Bio-Economy agenda of the EU and the negative consequences of herbicide-based weed control strategies, there is now an increased need to manage weeds more sustainably to ensure a safe, steady supply of food, feed and biomaterials while minimising environmental impacts. Effective integrated weed management (IWM) strategies are needed to help limit:

- Weeds establishing from the soils natural seed bank or rhizomes etc.
- Competition for resources such as light, nutrients and water by removing weeds or manipulating the weed flora to reduce its competitive impact
- The build-up of seeds and the plant's vegetative organs in the soil

What we are doing

The project is aiming to improve the applicability of non-chemical weed control methods in four different farming systems and will work in close collaboration with the relevant industries. It is focusing on reducing reliance on herbicides by replacing them, wholly or partly, with non-chemical alternatives.

CABI's role in the project is to study factors affecting weed establishment in perennial grasslands across Europe and then design context-dependent management strategies to prevent or reduce weed problems in them. Capitalising on findings from previous projects, CABI, together with Swiss Federal Research Station Agroscope and the University of Fribourg, will also explore a novel approach for IWM in Europe: the development of a biological control product for native weeds using highly specific native herbivorous insects. For this part of the project, we will be focusing on *Rumex spp.*, commonly known as docks, which are among the most problematic weeds in European grasslands.

Results so far

Two root-boring insects, which can cause significant root decay in *Rumex* plants, were found to reach only moderate densities under field conditions in Switzerland. Experimental studies revealed that the low numbers of larvae per plant can partly be explained by interference competition; upon encounter, one larva is often killed by the other larva. Moreover, the low efficiency of the herbivores in the field trials in Switzerland may have also been due to unfavourable climatic conditions.

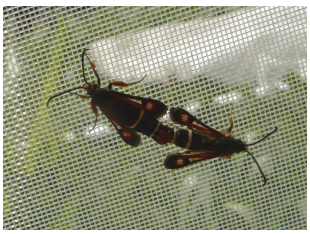
In an identical field trial in south-eastern Europe, where the climate is warmer and less humid than in Switzerland, one of these root-boring insects incurred high mortality of small and medium-sized Rumex plants. Further investigations are underway to assess the prospects of using these native root-boring insects for augmentative biological control of Rumex species in Europe, either alone or in combination with other management approaches.

Partners

Stichting Wageningen Research (Netherlands), Agricultural Institute of Slovenia (Slovenia), Rothamsted Research Limited (UK), AGROSCOPE (Switzerland), Aarhus University (Denmark)

CABI Project Manager

Urs Schaffner



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