

Innovative design and management to boost functional biodiversity of organic orchards

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Project introduction

The **main aims** of EcoOrchard are:

- To assess and increase knowledge on functional biodiversity of organic orchards.
- To prove methods for promotion of natural enemies of key apple pests in common field trials.
- To develop easy tools for farmers to assess functional agro-biodiversity in their orchards.
- To create a web-based platform to share information on functional biodiversity in pome fruit production (EBIO-Network).

The **project partners** are:

Universities, research institutes, advisory services and collaborating farmers of nine European countries (Figure 1). This project is funded by the COREorganic Plus Program of the EU and national funding bodies for three years (2015 - 2017).



Fig. 1: Contributing countries, Map: ArcGIS

The key apple pests are:

- **Rosy apple aphid**
(*Dysaphis plantaginea*)



Fig. 4: *Dysaphis plantaginea*



Fig. 5: *D. plantaginea* damage on leaves and apples.

- **Codling moth**
(*Cydia pomonella*)



Fig. 6: *Cydia pomonella*

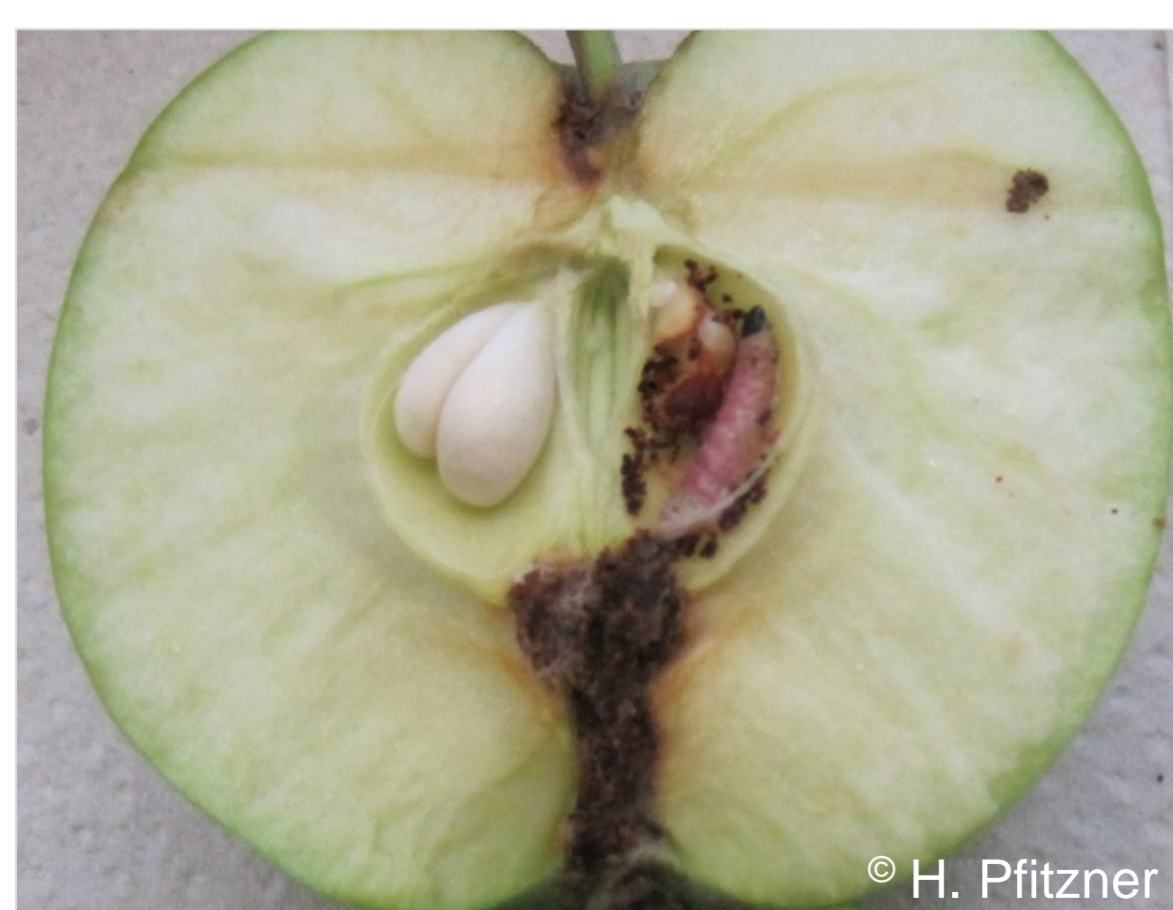


Fig. 7: *Cydia pomonella*, larva in apple.

Control



Fig. 3: Flower strips

Support



Fig. 8: *Episyrphus baleatus* on *Medicago lupulina*.

The key beneficials are:

- **Aphid antagonists:**
 - Syrphidae
 - Coccinellidae
 - Anthocoridae
 - Chrysopidae
- **parasitoids of *C. pomonella***
- **general predators**



Fig. 9: Larva of Coccinellidae at work.



Fig. 10: Larva of *Chrysoperla carnea*



Fig. 11: *Ascogaster quadridentata* on *Daucus carota*.

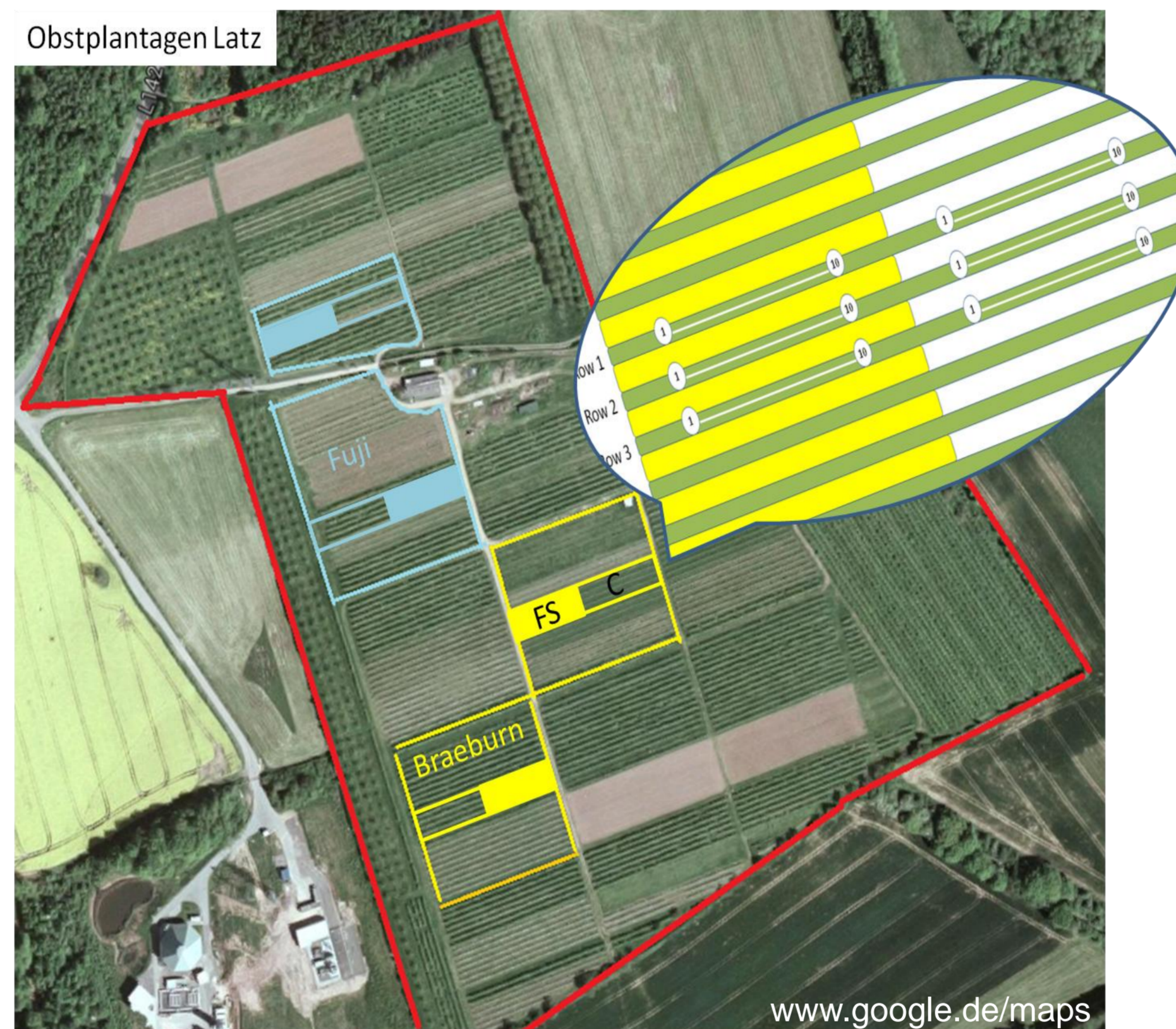


Fig. 2: Experimental design of the flower strip trials at the German experimental site.

Field trials

Standardised field trials have been conducted in organic orchards in six participating countries by establishment of flower strips in interrows in 2015 (Figure 2).

The suitability of a particular flower mixture for promotion of beneficials is investigated.

The flower strips:

- The designed EcoOrchard seed mixture contains more than 30 perennial herbs (20%) and grass (80%) species. The seeds were obtained from regional provenance (Figure 3).
- The selected plants offer shelter and food resources for beneficials.

Additional research activities

Studies on effects of the flowering plants from the seed mixture on main pests and beneficials as well as their requirements for food resources, particularly nectar and pollen. → **Optimization of seed mixture**