

Integration of biological resources in horticultural production

Summary

Sustainable strategies have been implemented to produce high added-value food and to reduce the use of pesticides, water and fertilizers. The positive effect of ecological infrastructures has been verified to conserve natural enemies in open field tomato, lettuce, onion and artichoke for the application of biological control. The use of companion plants of calendula for the transfer of the predator *Macrolophus* between successive tomato crops has been tested. The use of fertilizers and mycorrhizas have been optimized to reduce the contribution of nitrogen and phosphorus in tomato and onion.

Objectives

1. To improve conservation biological control of predators with the use of ecological infrastructures.
2. To reduce the use of fertilizers with the addition of arbuscular mycorrhizal fungi.

Description of project activities

1. Ecological infrastructures have been evaluated with *Calendula officinalis* and *Lobularia maritima* plants for the conservation biological control in tomato, lettuce, onion and artichoke
2. A method to use relay plants of *Calendula officinalis* has been set up to favor the transfer of the predator *Macrolophus pygmaeus* between successive tomato crops
3. Mycorrhizas have been evaluated to favour the establishment of insect plants within ecological infrastructures
4. The use of fertilizers in combination with arbuscular mycorrhizal fungi has been optimized

Final results and practical recommendations

The positive effect of ecological infrastructures on the establishment of natural enemies, such as tomatoes with calendula plants, and syrphids on lettuce, onion and artichoke with lobularia plants has been validated. In the case of tomato, the influence of the margin on the subsequent colonization of the crop by predatory mirid bugs has been verified.

A method of using calendula plants has been developed for the transfer of the predator *Macrolophus pygmaeus* between successive tomato crops. This system allows multiple colonization points inside the crop, and the improvement of the early and uniform distribution of the predator within the tomato greenhouses.

Good production and quality results have been obtained in the tomato and onion crops, reducing nitrogen and phosphorus intake, and inoculating with mycorrhizal fungi.

Conclusions

The project have improved different aspects of sustainable management of natural resources that are important for crop sustainability such as:

1. The agricultural biodiversity with the conservation of native beneficial insects and the use of mycorrhizal fungi
2. The management of fertilizers and the reduction of pesticides, rationalizing fertilizer inputs and

implementing integrated pest management programs based in biological control
3. The soil management using sustainable techniques (fertilization and mycorrhizas) to face soil depletion problems with replanting syndrome

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Keyword-category

Agricultural production system
Plant production and horticulture

Territorial scope

Province

Barcelona

County

Maresme

Baix Llobregat

Project dissemination *(publications, seminars, multimedia...)*

Cinc jornades tècniques incloses al PATT
Nota i Article tècnic a la revista La Terra

Pàgina web del projecte

<http://www.hortasostenible.cat/>

Other project information

Projecte period

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