# How I implement IPM

***Details of a holistic IPM strategy with low pesticide input in a European farm***

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## My farm

### PEDO-CLIMATIC CONTEXT

- Almeria-type greenhouse (medium level of technology, unheated)
- Organic amendments (manure and compost) added every two to three years

### MAIN PESTS

- Aphids in sweet pepper and watermelon crops
- Whiteflies and *Tuta absoluta* in tomato crops

### AGRONOMICAL CONTEXT

- Greenhouse area: 3 ha
- Sweet pepper, tomato and watermelon crops
- Biological control use, releasing natural enemies in the crop, and interplanting flower strips.

### SOCIO-ENVIRONMENTAL CONTEXT

- Stable workforce
- Organic certified crops
- Ecological restoration of surrounding lanscape with hedgerows

### OBJECTIVES AND MOTIVATIONS OF THE FARMER

Eliminate the use of insecticides, reduce fungicide use, improve soil fertility

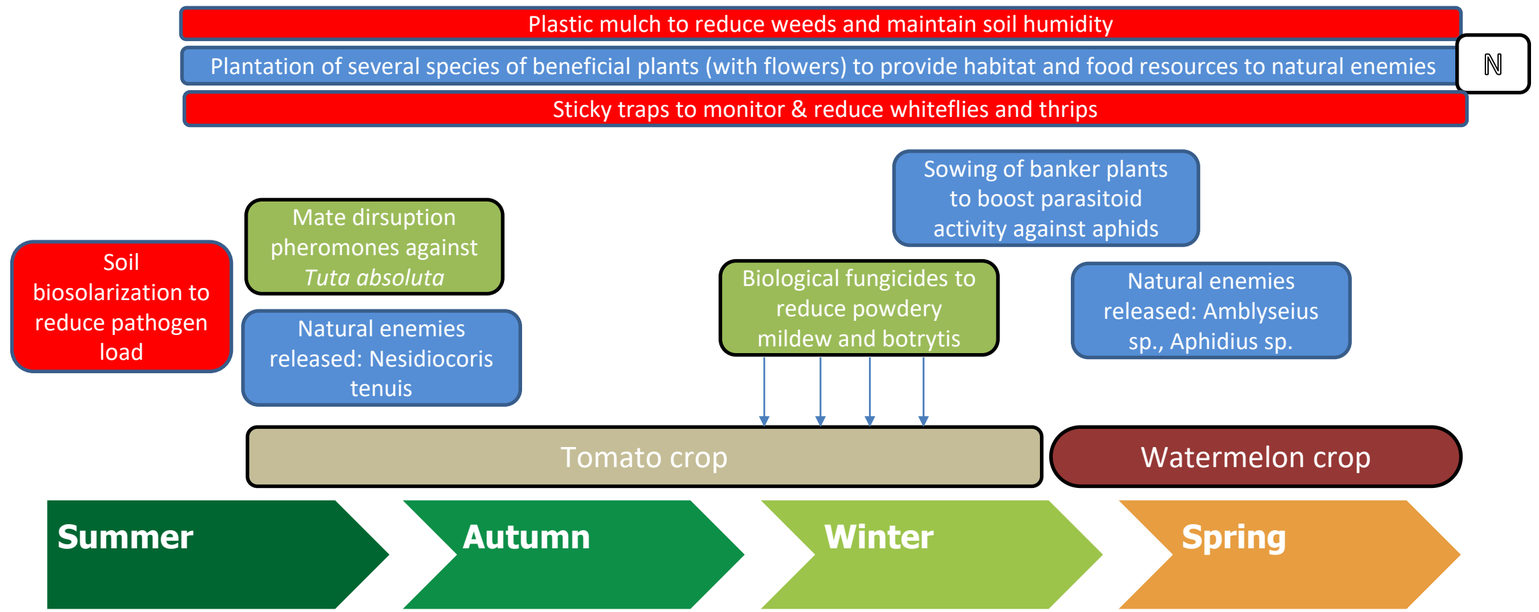
# My strategy

**Alternative solutions**

Agronomical

Genetics

Physical control




**Chemicals and biocontrol**

Insecticides and other pesticides* Fungicides* Herbicides* *In green = low risk PPPs * In blue = biocontrol agents

*Legend* ℕ **New solution** ~~**Solution**~~ **Abandoned solution** **Non systematic solution**

## Key measures

- A typical example of an annual cycle: tomato crop planted in summer followed by a watermelon crop planted in late winter.
- Both crops start with the release of natural enemies to prevent pest damage.
- Before planting the tomato crop, beneficial flowering plants are planted to boost biocontrol activity.
- Sticky traps are used in both crops to monitor and reduce pest pressure.
- In the case of tomato crops, sex pheromones are used to reduce Tuta absoluta abundance.
- Soil biosolarization is used to reduce pathogen load during summer.
- Weed germination is reduced using plastic mulch.

# My results

**Evolution trend on the farm**

## Pests control

| Very good | Medium | To improve |
|---|---|---|
| Aphids<br>Whiteflies<br>Weeds | *Tuta absoluta*<br>Spider mites<br>Powdery mildew | Thrips<br>Botrytis |

## Evolution of use of pesticides

| Very good | Medium | To improve |
|---|---|---|
| Insecticides<br>Biocontrol<br>Herbicides (not used) | Fungicides | |

## Sustainability indicators

| Very good | Medium | To improve |
|---|---|---|
| ↗↗ Level of overall satisfaction of the farmer | ↘ Use of fossil energy | ↘ Distribution of work over the year |
| ↘ Use of chemical fertilizers | ↘ "Complexity"of the cropping system | = Use of sustainable energy |
| ↗↗ Use of conservation biological control [landscaping] | Equipment usage time | = Standardized operating expenses |
| ↘↘ Use of dangerous or toxic products for the user | ↗↗ Labour employment conditions | = Real gross product with self-consumption |
| ↘↘ Use of products that are dangerous or toxic to the environment | = Actual mechanization load | |
| ↘ Pesticides costs | | |

## Key conclusions

- Esther understands the benefits of increasing biodiversity: pest pressure diminishes via a boost in biological control.
- Released species live longer, have a higher reproduction rate and a control efficacy. Several beneficial insects arrives spontaneously.
- The entire system, including the acquisition of extra plants and biocontrol agents has a cost which is the same as for control with pesticides in previous years.
- The effect of biological control is far better than the effect of pesticide treatments. The biological balance avoids that aphids cause damage.

***Legend***

In green = positive trend
In red = negative trend
In black = comparable

= Comparable

↗ Increase
↘ Decrease

↗↗ Significant increase
↘↘ Significant decrease

Environmental indicators
Social indicators
Economical indicators

# Our feedbacks

"This biological control system is not only profitable for organic growers, but equally for all conventional growers. Within a few years, all growers will be experts in recognizing 'bugs' and management of biodiversity."

**Esther Molina (Spain)**

**Main objective of the farmer**

- Limit or even eliminate in the short term the use of pesticides

**Advantages of the system**

- State-of-the-art conservation biological control techniques that push the grower to ask herself more questions and to observe her crop and the surroundings .
- Access to certifications environmental through the decrease in the use of pesticides. Positive consequences for her cooperative and peers in terms of communication and promotion of GAPs and IPM.

**Limitations of the system**

- Practices that often require a gradual increase of observation and knowledge, especially during the "transition" from conventional agriculture.

"Esther understands and recognizes the importance of the ecological interactions occurring in her greenhouse that provide her a high level of biological control and resilience against pests and diseases. She is a great example and a natural leader to other farmers in the region."

**Eduardo Crisol-Martínez (Spain)**

**Opportunities to develop in the future**

- Esther keeps expanding her interest in improving biodiversity conservation in the surroundings of her greenhouse, including animals and plants.
- She is also starting to learn new techniques to improve soil fertility in her crops
- There is also space to keep learning and adopting new methods to reduce fungicide use



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