IPM SURVEYS FACTSHEETS

Greenhouse Horticulture

IPMWORKS - *An EU-wide farm network demonstrating and promoting cost-effective IPM strategies* - is a four-year project (2020-2024) financed by the Horizon 2020 Research and Innovation programme of the EU. IPMWORKS is made up of a consortium of 31 partners from 16 European countries assembled with various types of organizations covering the following roles: Farmers organizations; Applied research, advisory and extension services; Academic research on social sciences; Academic research on agronomy (sensu lato) and environmental science and Training organizations. The project is coordinated by the French National Research Institute for Agriculture, Food and the Environment (INRAE).

INTEGRATED PEST MANAGEMENT

Integrated Pest Management (IPM) is based on a diversity of pest management measures (prevention, non-chemical control, best practices for optimizing pesticide efficiency, etc.). These are combined at the farm level to enable reduced reliance on pesticides, and therefore a decrease in the exposure of the environment and people to pesticides. Rare pioneer farmers throughout Europe are testing such IPM strategies and are succeeding in achieving good outcomes with low pesticide inputs. However the majority of European farmers still rely heavily on pesticides, with major environmental and societal impacts, because most of them have not adopted a comprehensive, farm-level and holistic IPM strategy so far.

FARMERS' AWARENESS OF IPM AND MOTIVATIONS

Farmers' motivations and level of IPM adoption have been investigated through a survey, just after the farmers joined the network.

"I try to restrict my use of crop protection products", "IPM is a way to reduce pesticide use", "As little administrative effort as possible" and "Not compromising my health" are considered to be the most important statements informing about farmers' motivations.

"Maintaining agricultural traditions" are considered the least important factor, indicating that farmers are open to change and adopting new practices that will benefit them now and in the future.

DATABASE

NUMBER OF FARMS: **23**

PARTICIPANT COUNTRIES:
SPAIN
BELGIUM

TOTAL ORGANIC FARMS: **6**

AVERAGE GREENHOUSE SIZE: **2,2 HA**

MAIN CROPS:
TOMATO
BELL PEPPER
CUCUMBER
WATERMELON
STRAWBERRY
RASPBERRY

AVERAGE EXPERIENCE OF FARMERS:
23 YEARS

IPM STRATEGIES USED

DECISION SUPPORT SYSTEM

Farmers did not cite any DSS for the implementation of herbicides, fungicides, insecticides, nematicides, slug control, and growth regulators.

DSS does not appear as a major component of IPM strategies in these farms.

BIOCONTROL

Biocontrol is the reduction of pest populations by natural enemies. Farmers were asked to indicate the 1) biocontrol agents to control diseases, 2) mating disruptions to control pests, and 3) biocontrol agents to control pests used for each crop.

Biocontrol solutions are a major component of IPM strategies in greenhouses.

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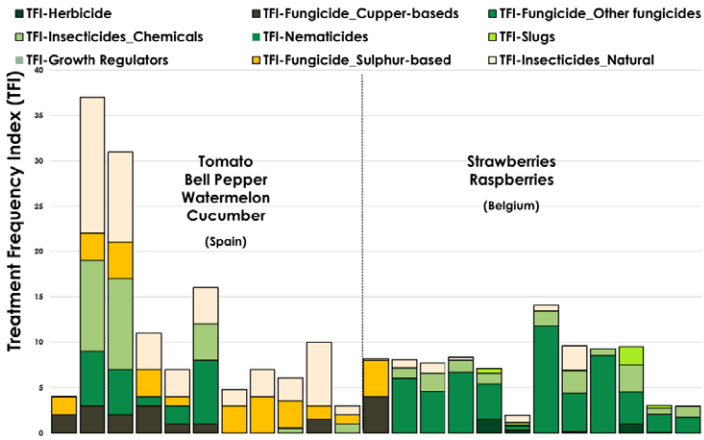
ECOLOGICAL INFRASTRUCTURE

Ecological Infrastructure focuses on preventive rather than reactive approaches to pest management, by increasing biodiversity and creating habitat for natural enemies. Farmers indicated the different ecological infrastructure methods used to control pests and diseases for each crop. The ecological infrastructure methods included: 1) hedgerows, 2) one or more species are grown in the greenhouses/tunnels to attract beneficial insects and 3) non-harvested species are grown in the greenhouses/tunnels to attract or repel pests (push-pull strategy).

Ecological approaches for attracting beneficial organisms are developing (particularly developing in the Spanish hub).

PESTICIDE USE



Treatment Frequency Index (TFI). TFI is used as a metric of frequency and intensity of pesticide use. The TFI was determined based on:

→ The number of treatments

→ Average dose (% recommended dose for target pest)

→ Average % of the treated area

TFI metric shows a large range of pesticide use across farms, that can be attributed to:

→ **Nature of crops**

→ **Level of IPM adoption**

IPM INDEX

We tested a new IPM Index calculated from the information collected on crop and pest management.

Spatial Management · *Variety choice* · *Decision making for treatments* · *Monitoring treatment effect* · *Number of growing seasons* · *Soil tillage* · *Landscape Management* · *Organic manure* · *Ecological infrastructure*

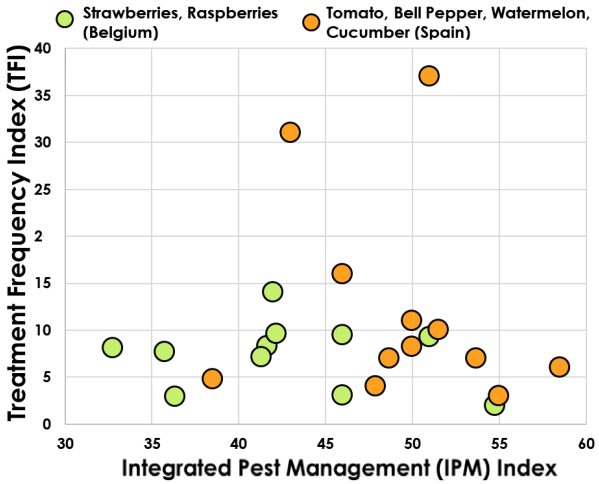
Mechanical weeding · *Mulch* · *Sowing/ planting date* · *Fertilizer use* · *Climate* · *Biocontrol* · *Choice of pesticides* · *Seed/ seedling treatments* · *Soil/ substrate disinfection*

Topics included in IPM Index:

Cultural practices at the crop and farm levels were evaluated based on the last 3 cropping seasons. IPM practices included in the index were e.g. use of biocontrol solutions, use of resistant cultivars, adapted planting dates to escape pests, use of Decision Support Systems, ecological infrastructures...

The IPM index is the sum of the weighted scores and ranges [0 - 80].

The range of IPM adoption varies across farms, and this explains part of the wide range of pesticide use.



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SELF-EVALUATION

DISEASE CONTROL

PEST CONTROL

Farmers consider disease and pest control similar to better compared to neighbor farmers whatever the level of IPM adoption.

IPM is efficient for both disease and pest control.

WORKLOAD

EQUIPMENT COST

GROSS MARGIN

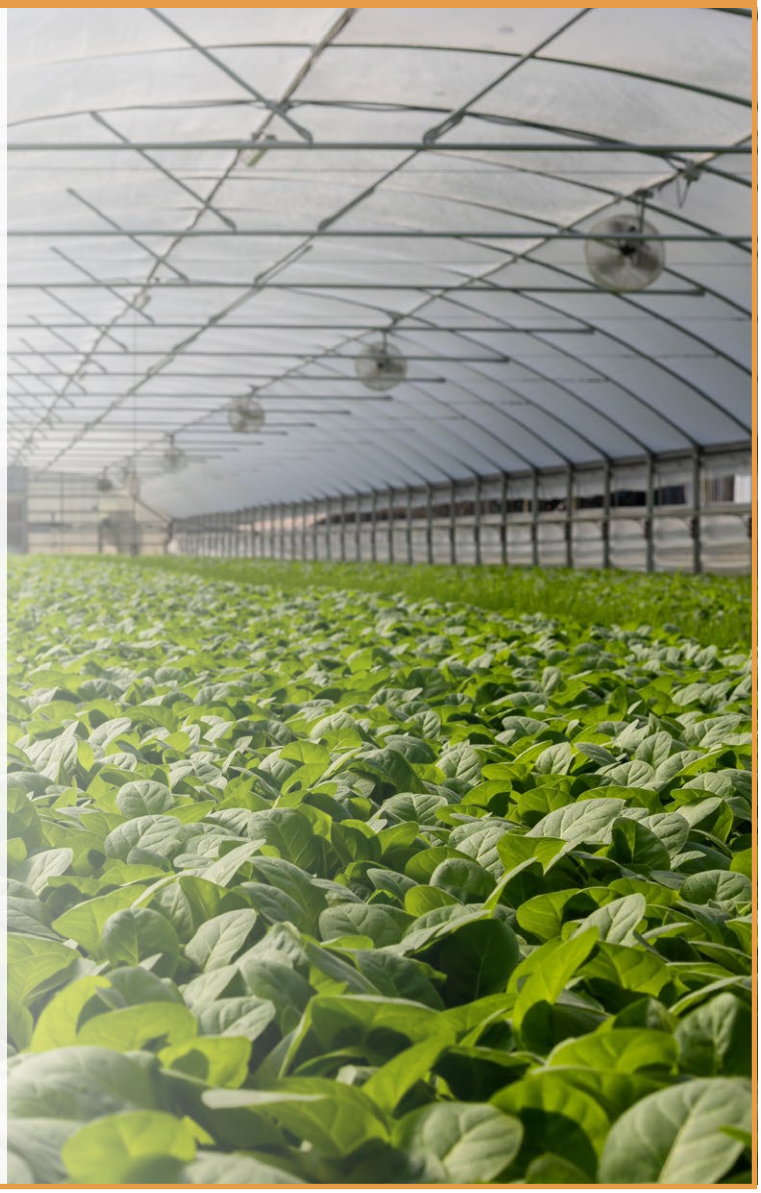
Whatever the level of IPM adoption farmers consider workload/ha to be similar to higher. IPM is time-consuming in greenhouses.

Farmers consider equipment costs to be similar whatever the level of IPM adoption.

No clear impact of IPM adoption on gross margin. **IPM is cost-effective.**

CONCLUSION

The IPMWORKS network of producers in greenhouse horticulture displays a large range of practices, wih various levels of IPM adoption. The more IPM is adopted, the less pesticides are needed, without any impact on economic outcomes. Further progress in IPM adoption can be done with the help of IPMWORKS hub coaches.



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