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THE EUROPEAN UNION' HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME  
UNDER GRANT AGREEMENT N. 101000339



**IPM**  
**works**

**GREENHOUSE  
HORTICULTURE**

The logo for 'IPM works' features the letters 'IPM' in a bold, green font. A small green leaf is positioned above the 'I', and a white insect is integrated into the 'P'. Below 'IPM', the word 'works' is written in a bold, orange font. To the right of 'works' is a stylized rainbow with seven curved bands in shades of green and orange.

*Survey #1: IPM awareness, IPM adoption,  
pesticide use and self-evaluation*

# TOPICS OF SURVEY #1:



**FARMING CONTEXT**



**FARMERS EXPECTATIONS AND PREFERENCES**



**CULTURAL PRACTICES: FARM LEVEL**



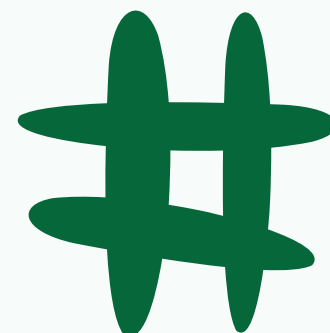
**CULTURAL PRACTICES: CROP LEVEL**



**PEST CONTROL EFFICACY: PERCEPTION OF THE FARMER**



**COST-EFFICIENCY-PERCEPTION OF THE FARMER: SELF-EVALUATION**



**NUMBER OF FARMS**

**23**



**PARTICIPANT COUNTRIES**

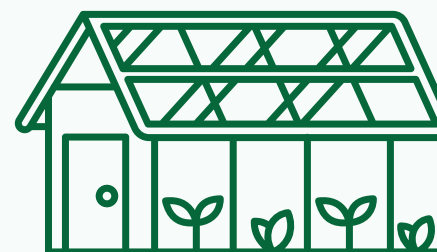
**SPAIN**

**BELGIUM**



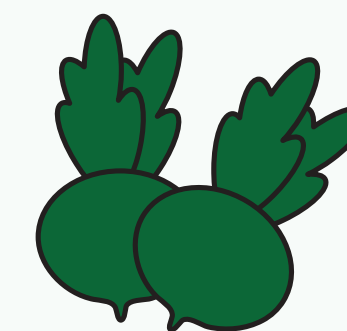
**TOTAL ORGANIC FARMS**

**6**



**AVERAGE GREENHOUSE SIZE**

**2,2ha**



**MAIN CROPS**

**TOMATO**

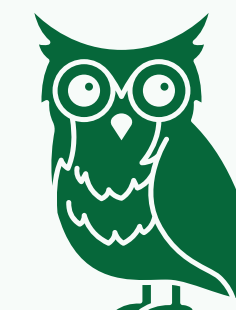
**CUCUMBER**

**STRAWBERRY**

**BELL PEPPER**

**WATERMELON**

**RASPBERRY**



**AVERAGE EXPERIENCE OF FARMERS**

**23 YEARS**

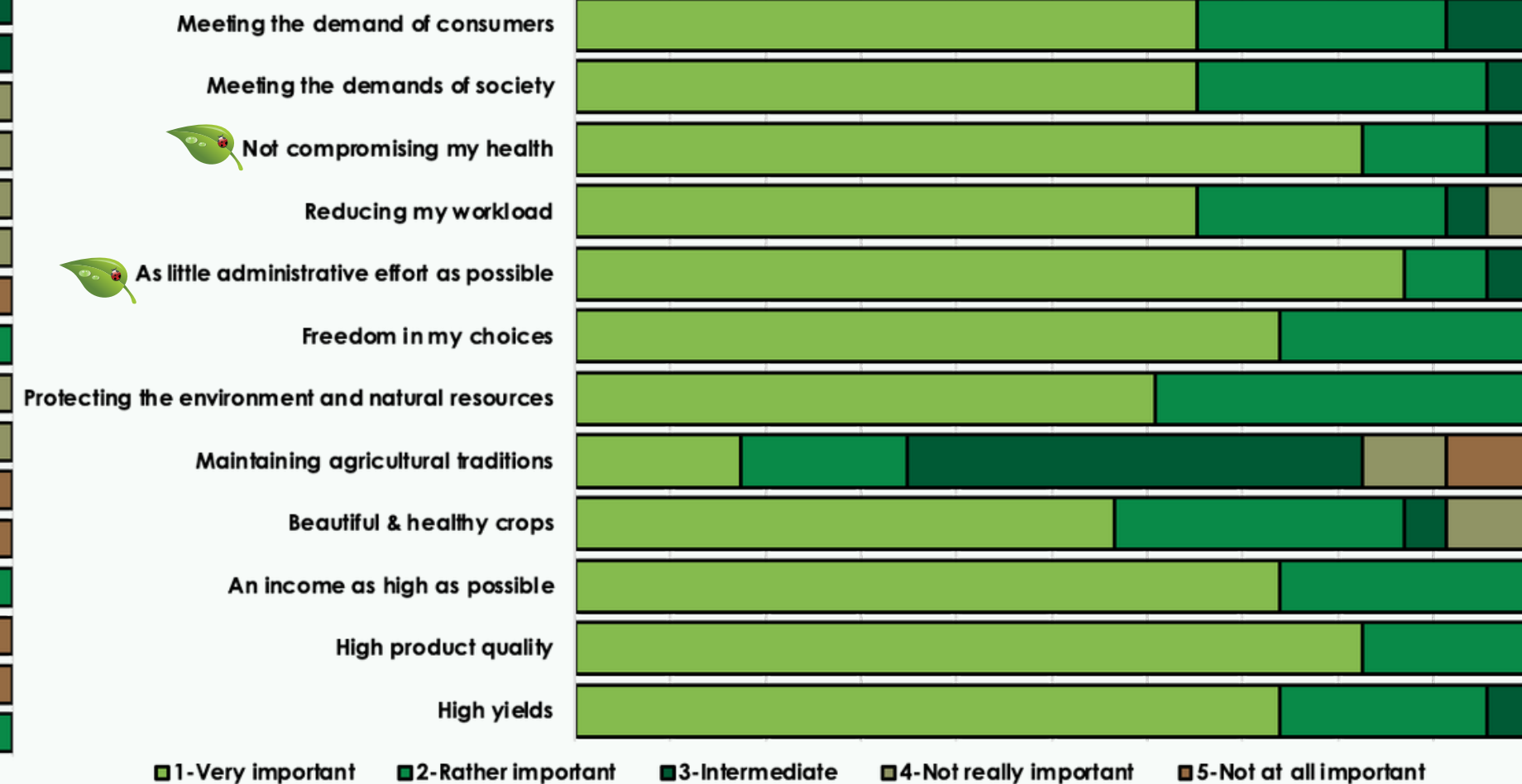
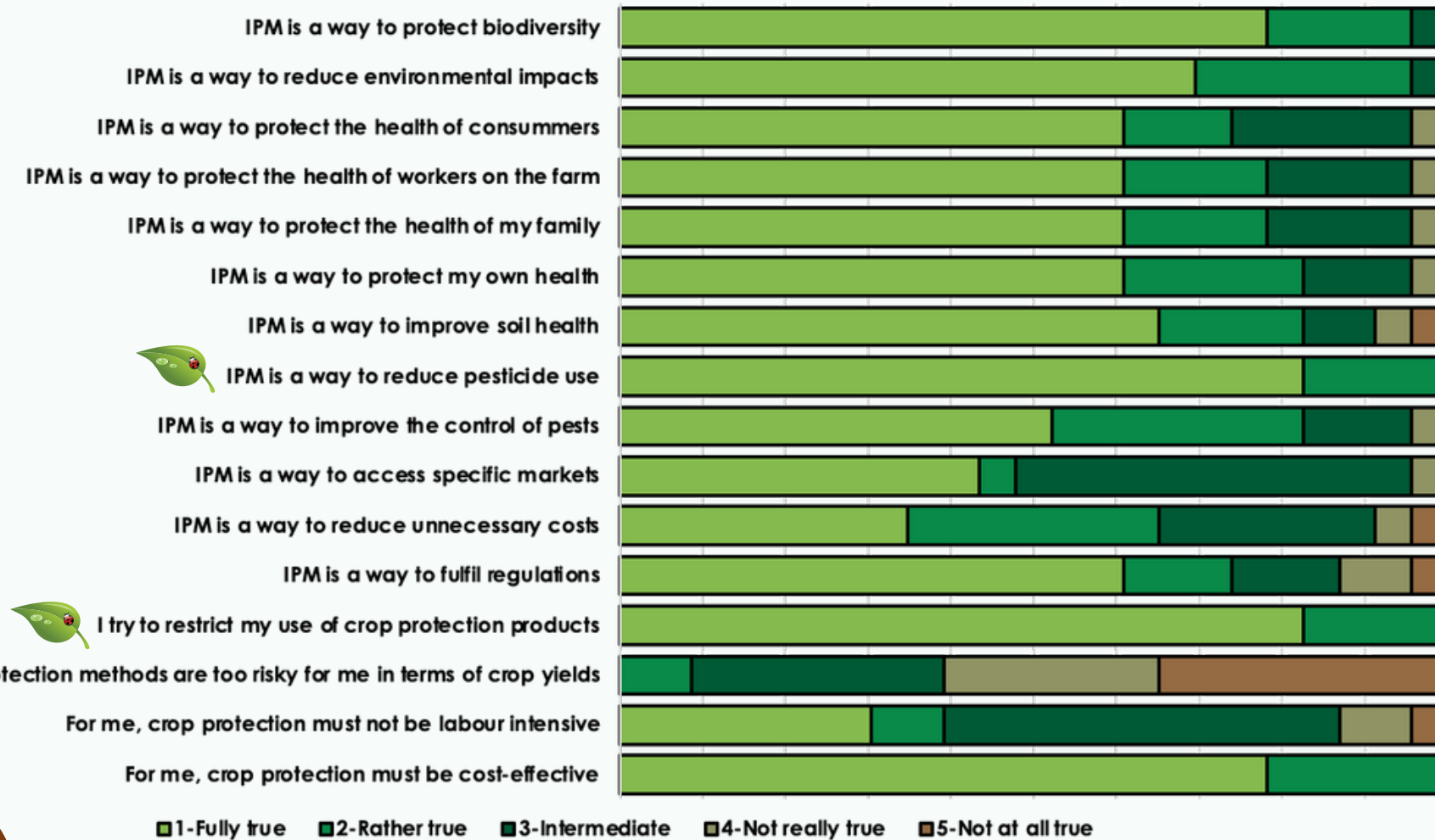


# Farmers' Awareness of IPM and Motivations

Rating statements from "Fully true" to "Not at all true" or "Very important" to "Not at all important".

## OBJECTIVES

## MOTIVATIONS

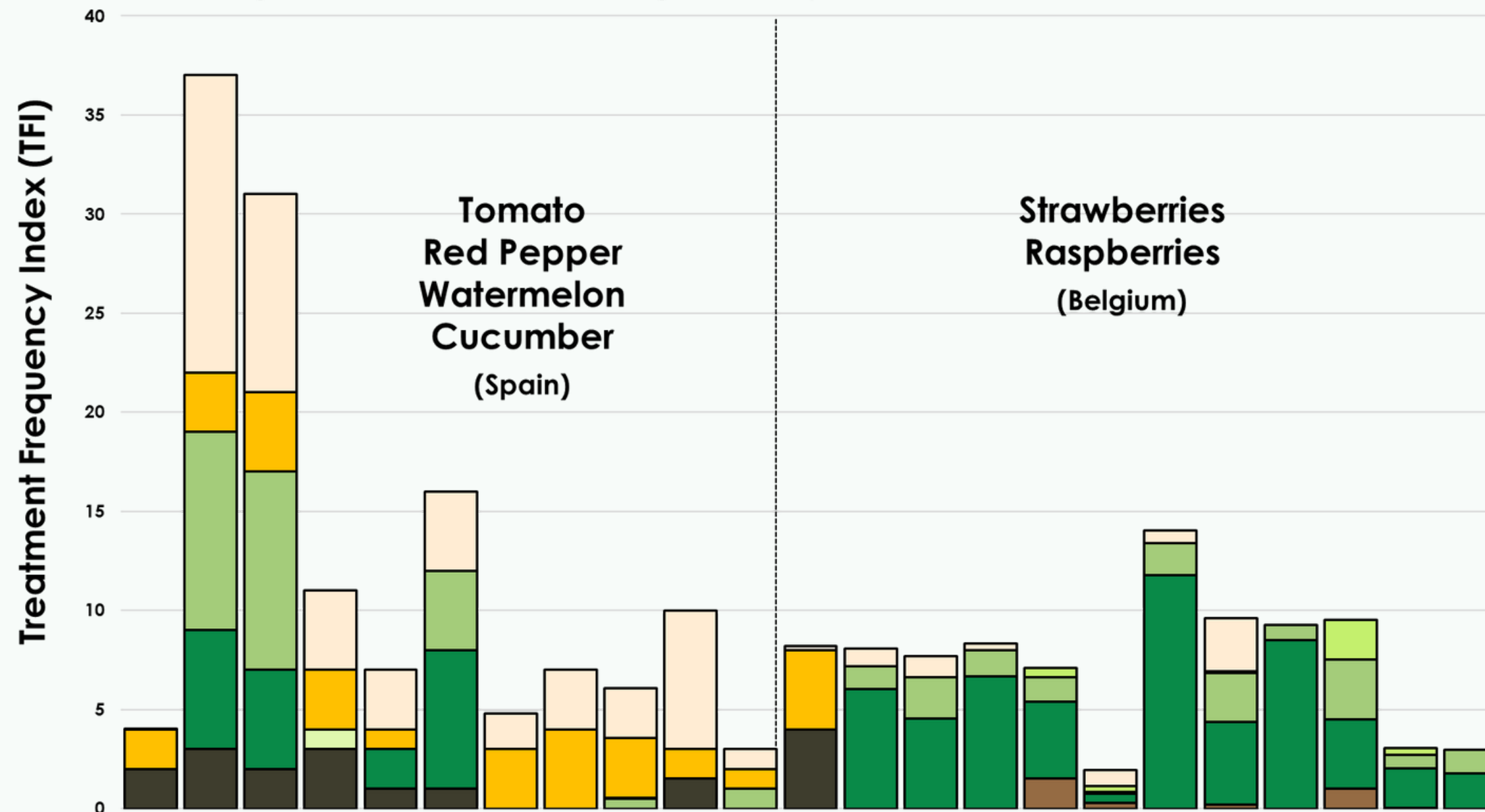


**"I try to restrict my use of crop protection products", "IPM is a way to reduce pesticide use", "As little administrative effort as possible" and "Not compromising my health" are considered to be the most important statements for successful IPM adoption.**

**"Maintaining agricultural traditions" is not something important, indicating that farmers are open to change and adopting new practices that will benefit them now and in the future.**



# Pesticide Use



High-impact chemical pesticides are shown in dark colours at the bottom. Low-impact natural pesticides are shown in light colours at the top.

## 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 treated area (default = 100)

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

- **Nature of crops**
- **Level of IPM adoption**

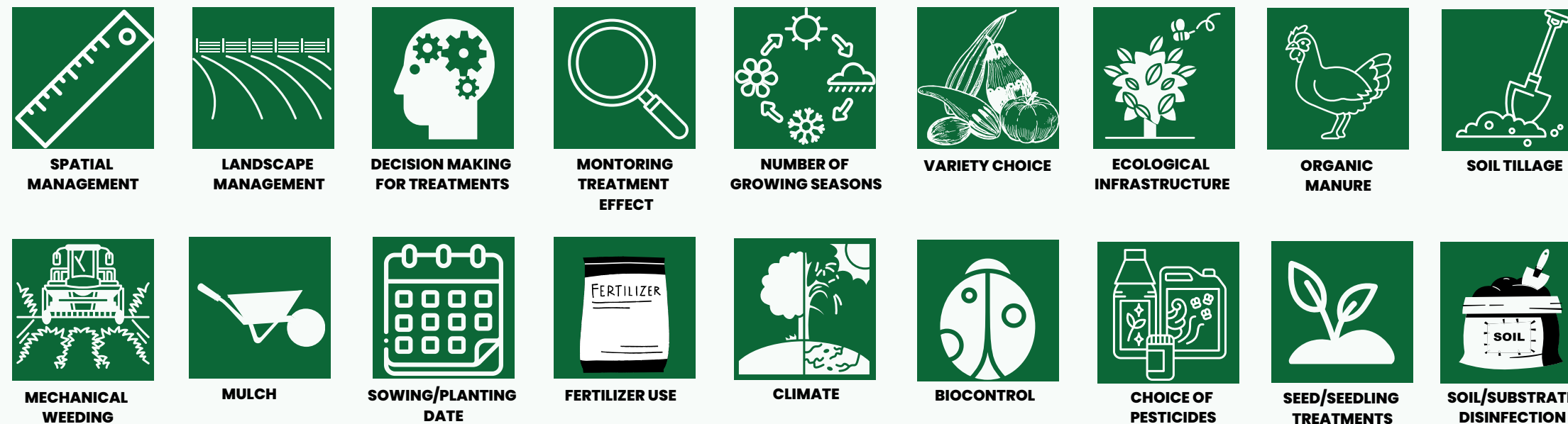




# Integrated Pest Management Index



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

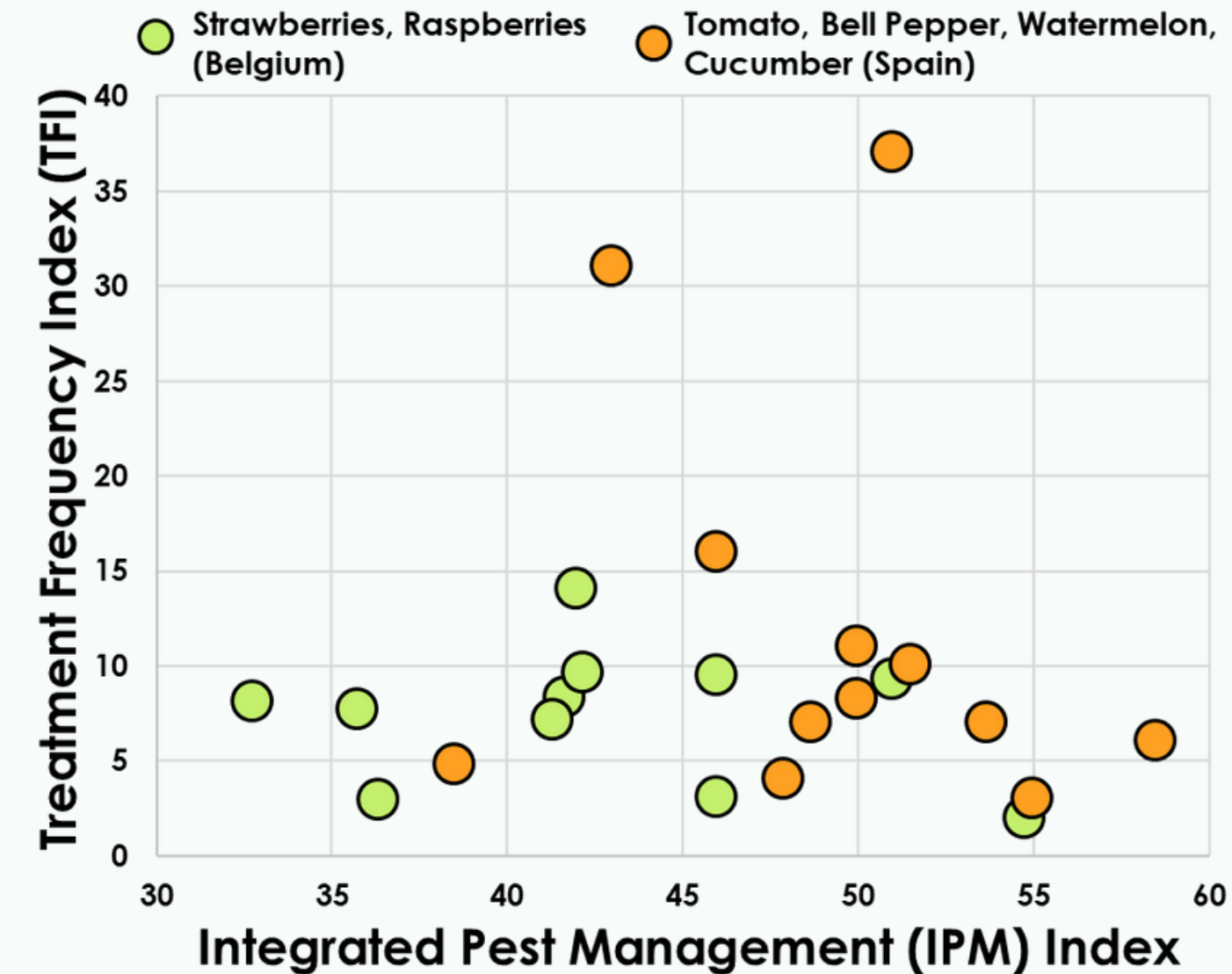


## Topics included in IPM Index:

Cultural practices at the crop and farm levels were evaluated based on the last 3 cropping seasons. Farmers rated these practices between 1 (“Not at all true”) and 5 (“Fully true”), based on their individual perspectives.

Each practice rating was then scored between 0-4 and carried a weight of 1 in the calculation of the IPM Index, except “Biocontrol” and “Choice of Pesticides” which had a weight of 2.

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



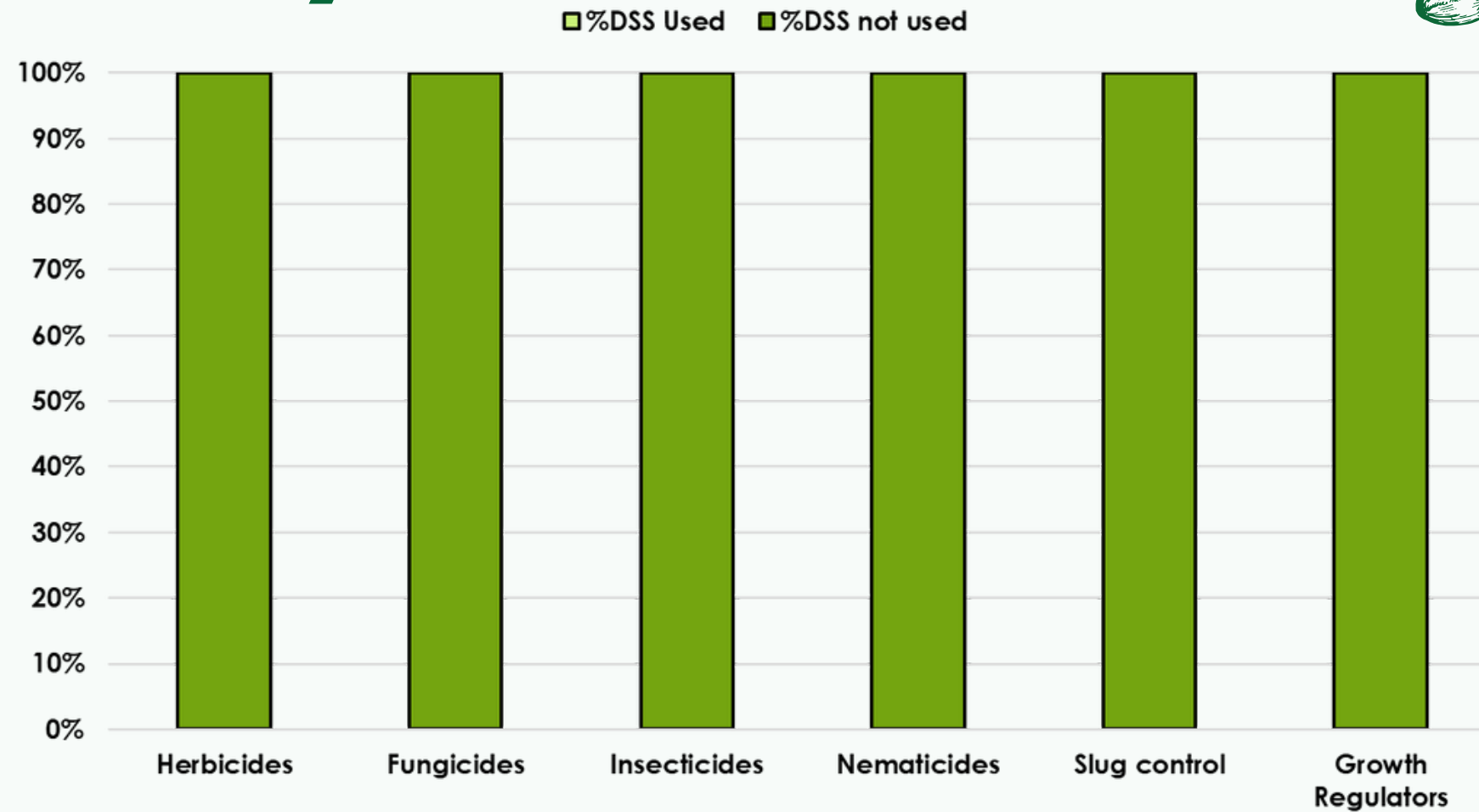
The range of IPM adoption varies across farms, and this explains part of the pesticide use.



# Decision Support System

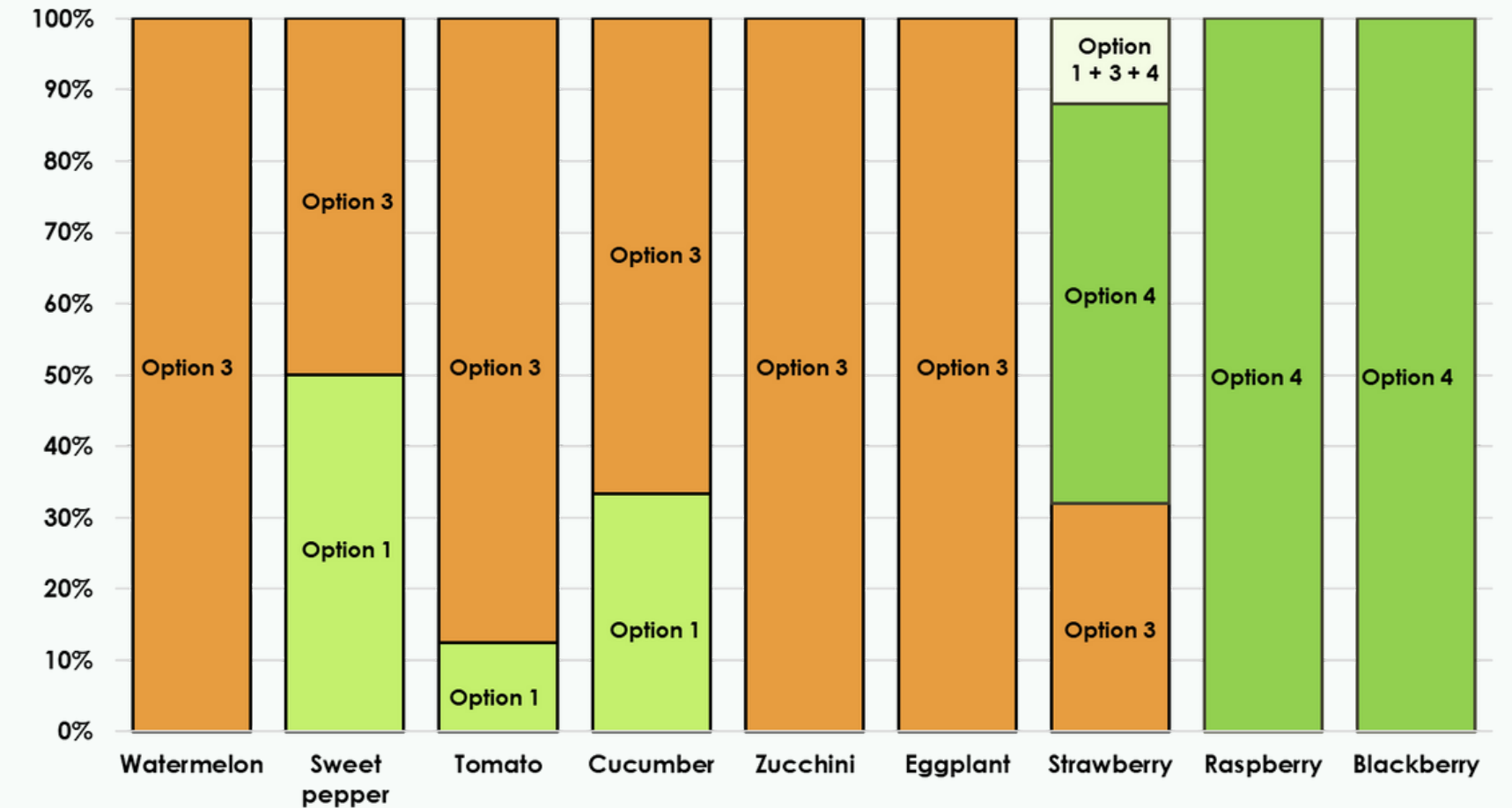


# Variety Choice



Farmers did not cite any Decision Support Systems (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.**

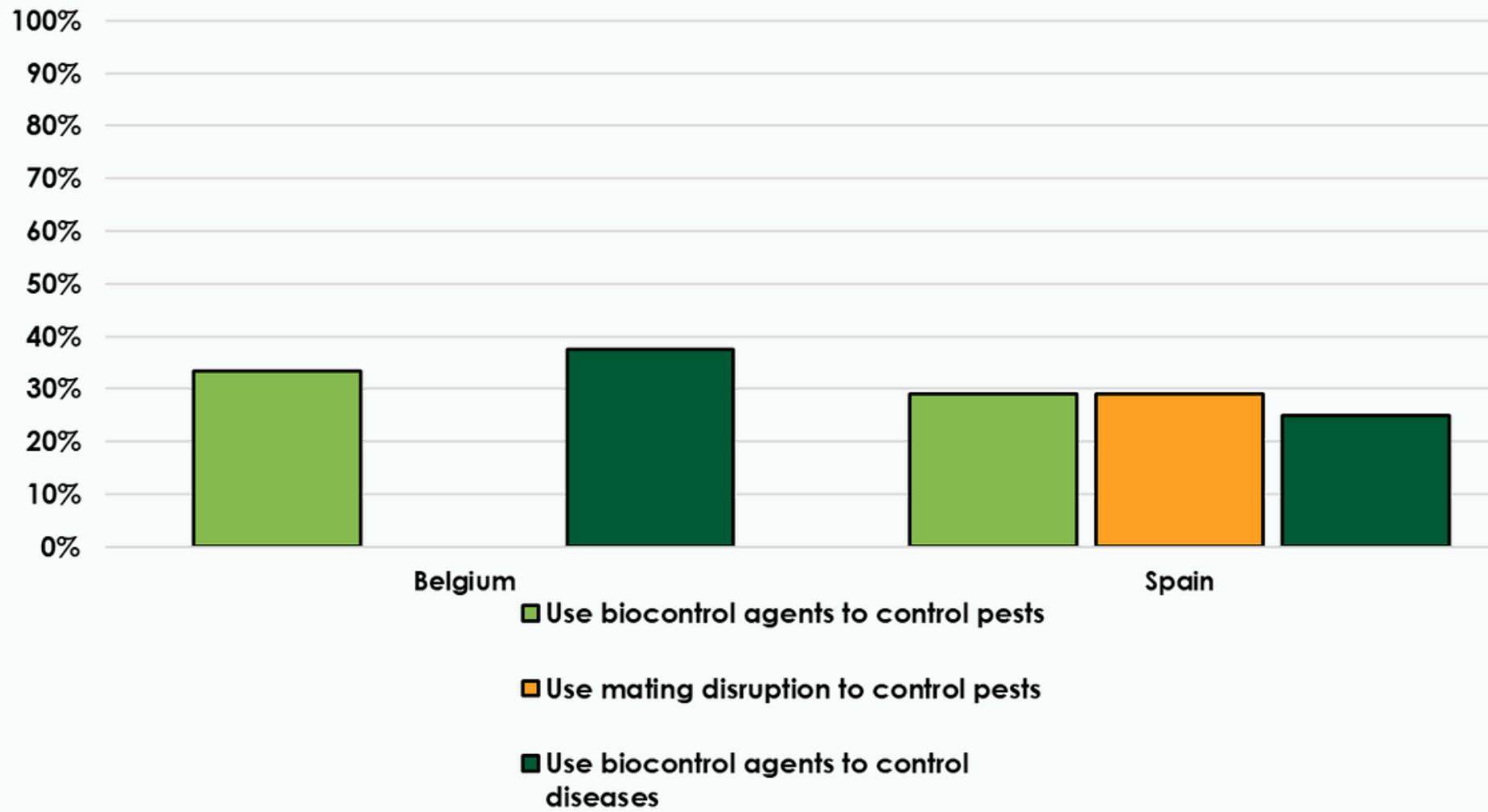


- **Option 1** I choose predominantly varieties that are resistant against diseases and focuses on healthy seed/planting material
- **Option 2** I predominantly mix varieties, with at least 3 different varieties and focus on healthy seed material
- **Option 3** In some cases, I choose varieties that are resistant against diseases
- **Option 4** I only choose varieties according to yield or market, or season, without checking if they are resistant to disease if you have no answer for a crop

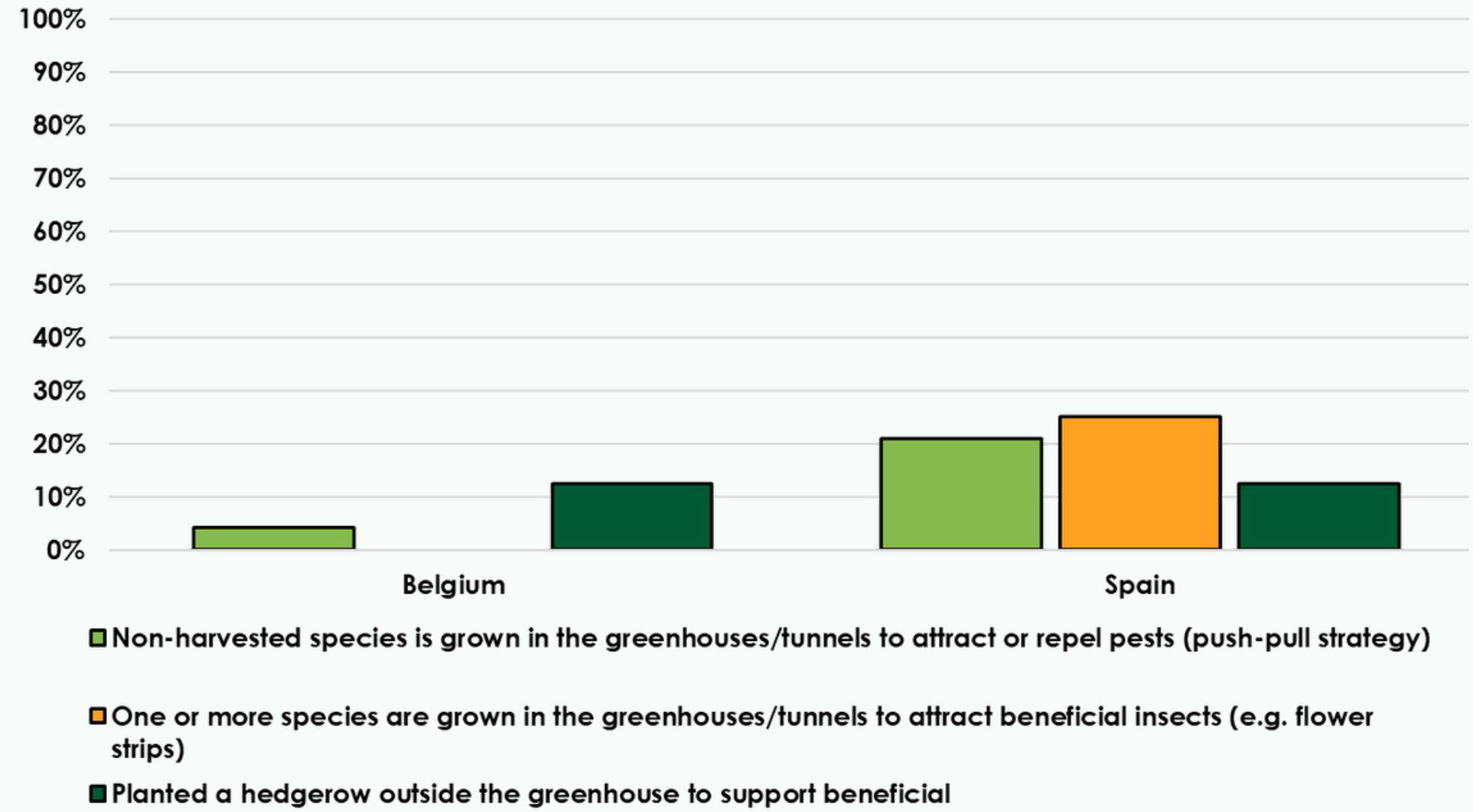
**Farmers chose cultivar varieties resistant to diseases.**

**THE SURVEY INFORMS ABOUT HOW FAR THE VARIOUS COMPONENTS OF IPM ARE ALREADY IMPLEMENTED BY IMPWORKS FARMERS IN GREENHOUSE HORTICULTURE**





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



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



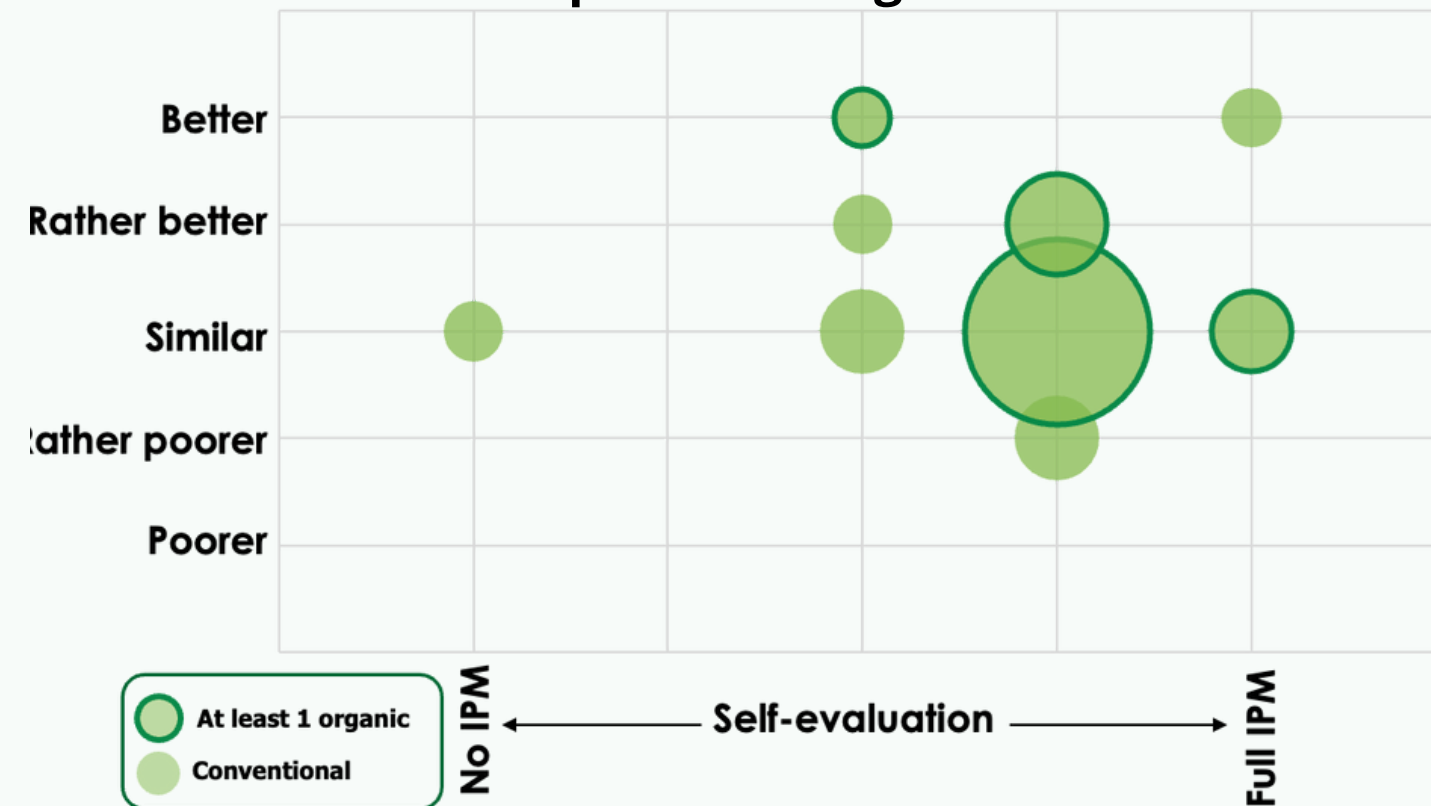
**THE SURVEY INFORMS ABOUT HOW FAR THE VARIOUS COMPONENTS OF IPM ARE ALREADY IMPLEMENTED BY IMPWORKS FARMERS IN GREENHOUSE HORTICULTURE**

# Self-evaluation

## WEED, DISEASE AND PEST CONTROL

Self-evaluation of the quality of the disease and pest control as compared to other farmers in the area. Results are presented as a function of self-evaluation in IPM adoption.

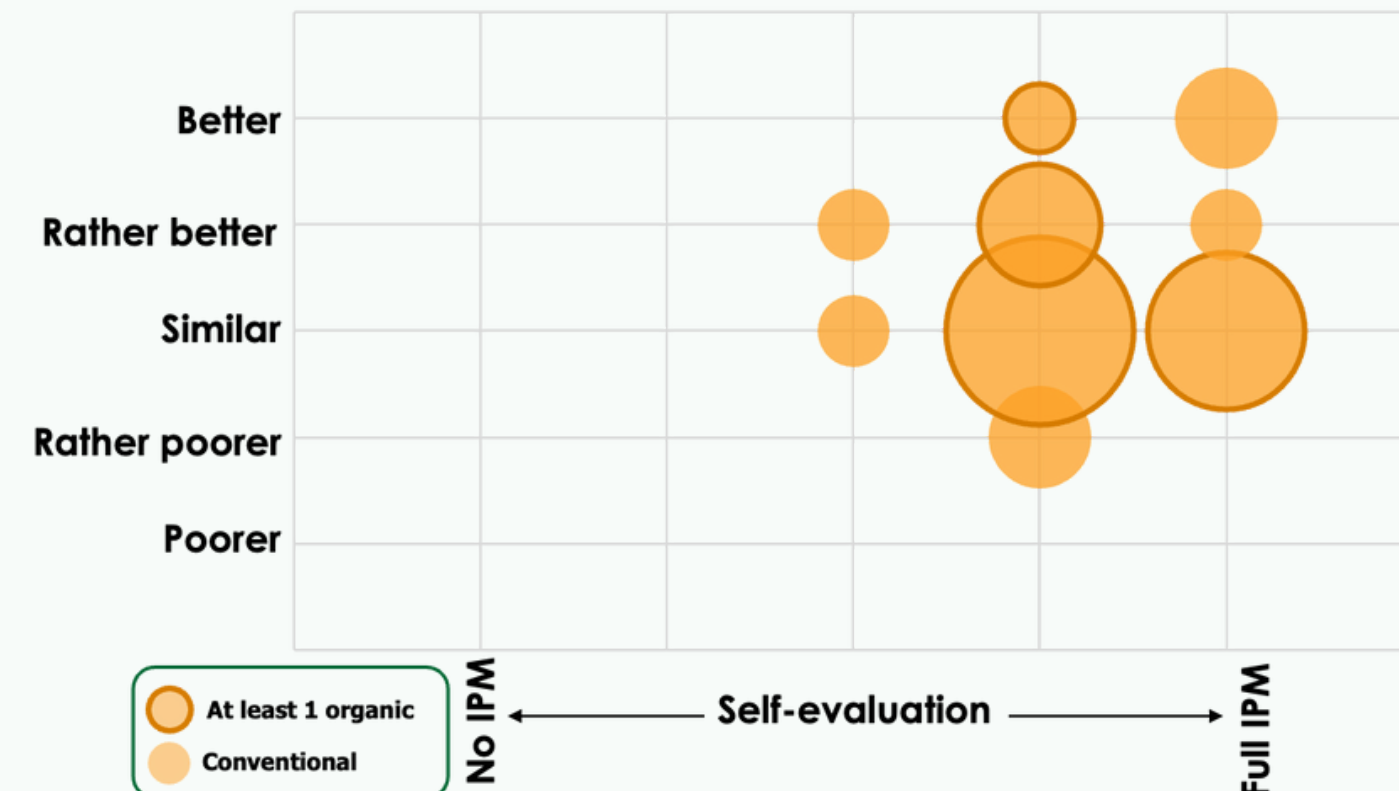
### Quality of Disease Control as compared to neighbour farmers...



Farmers consider disease control to be better than neighbour farmers, whatever the level of IPM adoption.

IPM is rather efficient for disease control.

### Quality of Pest Control as compared to neighbour farmers...



Farmers consider pest control similar to better compared to neighbour farmers, whatever the level of IPM adoption.

IPM is rather efficient for pest control.





# Self-evaluation

## FARM PROFITABILITY

Self-evaluation of workload/ha, equipment costs, and gross margin as compared to other farmers in the area. Results are presented as a function of the self-evaluation of IPM.

### Workload / ha

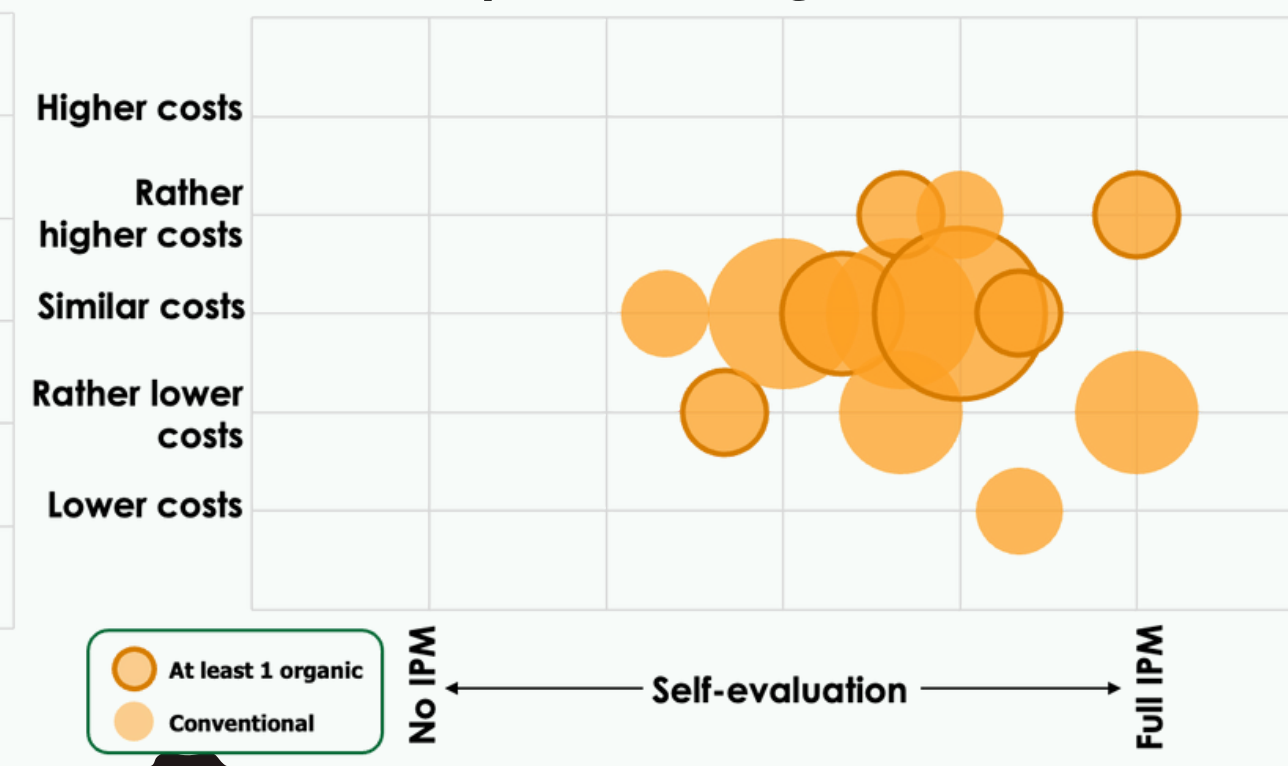
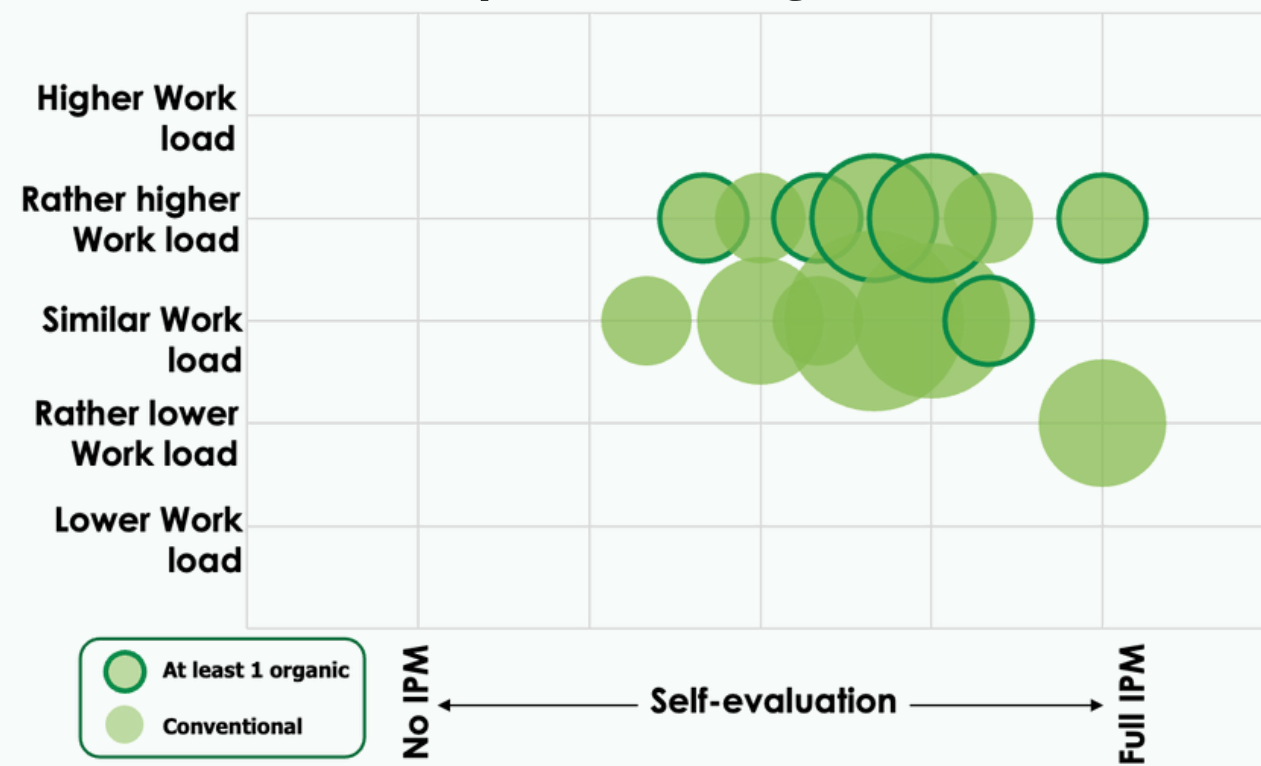
as compared to neighbour farmers...

### Equipment Costs

as compared to neighbour farmers...

### Gross Margin

as compared to neighbour farmers...



**Whatever the level of IPM adoption, farmers consider workload/ha to be similar to higher. IPM is rather 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.**



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