Report on demonstrations in 2023

Deliverable D3.5

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An EU-wide farm network demonstrating and promoting cost-effective IPM strategies

Coordination and Support Action (CSA)

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Deliverable D3.5

Report on Conducted Demonstrations in 2023

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☒	**PU**	Public
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Abstract

This Deliverable describes the IPM demonstration events conducted in 2023 in each participating country and existing hub in the third year of IPMWORKS. The document includes:

- a summary on the IPMWORKS project,
- an introduction on the contents of this report,
- a summarized overview of demo events in 2023,
- and specifics of each executed event.
- a conclusion section summarizing the main features and outcomes of the conducted demonstration events in 2023.

Contents

1. IPMWORKS: Summary

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. 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.

The objective of IPMWORKS is to promote the adoption of IPM strategies, based on an EU-wide demonstration network of farmers, who both progresses further in the adoption of IPM – through peer-to-peer learning, and joint efforts – and demonstrate to other farmers that holistic IPM "works", i.e., allows a low reliance on pesticides with better pest control, reduced costs and equal or enhanced profitability compared to a conventional approach. IPMWORKS advisors coordinating hubs (so-called Hub Coaches) have a major role in facilitating knowledge sharing, coaching farmers to find their own IPM solutions, and organizing local demonstration activities. IPMWORKS stimulates access to the 'IPM Decisions' platform and provides information on the IPM methods. IPMWORKS Hub Coaches are in charge of collecting data for comparing IPM strategies, and share results and dissemination material through channels widely used by farmers, broadcasting IPM success stories. IPMWORKS produced training material, available on the IPMWORKS web site (https://ipmworks.net/) and on the IPM Resource Toolbox (https://ipmworks.net/toolbox/en/#/), and organizes training sessions, targeting both farmers outside the network and advisory services, in order to prepare for the future dissemination of the peer-to-peer learning approach and the general adoption of IPM throughout the EU.

Project Acronym	IPMWORKS
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2. Introduction

IPMWORKS organizes a number of demonstration events each year in every hub for every participating country. Each IPMWORKS Hub is expected to organize at least 10 demonstration events over the course of the project. Each event is designed to promote IPM to the local farming communities, based on success stories in IPM adoption in IPMWORKS farms, and on innovative technics that are tested or used in the network. Guidelines have been disseminated at the beginning of the project to help Hub Coaches in the process of organizing the events so as to maximize their impact. A demo event might be focused on a specific solution contributing to pest management and the reduction of pesticide use. However, each event should also include some discussion about how this specific solution is combined within a holistic IPM strategy at the farm level, considering both the technical efficacy of the whole strategy and its cost-efficiency. Exit polls are used at the end of demo events to collect feedback from the attendees.

This document summarizes and describes all the conducted demonstration events in the project in 2023. For each event, the following details are provided:

- Event title, hub member, country, date, location and number of visitors
- General subject and goal of the demonstration
- Description of IPM strategies shown in the demonstration
- Promotion activities and communication and dissemination material used for the demonstration

This information is described in the next section.

3. Demonstration events in 2023

Demonstration events overview

The table on the next page gives an overview of the demonstration events organized for IPMWORKS in 2023. For every event, the title is included, as well as the organizing hub, country, date, location and number of visitors of the demonstration event. In total 92 demonstrations were conducted in 2023, with 3 222 visitors in total.

Sector	Event title	Hub	Country	Date	Numb
Arable Crops	Introduction of an innovative decisions support system for the efficient use of herbicides in corn and cerea	JKI	Germany	March	7
	Effects of variety selection in winter wheat and oilseed rape	JKI	Germany	May	19
	Mechanical weed control in arable crops	JKI	Germany	June	19
	Functionality and use of the Decision Support System InnoHerb	GLZ	Germany	March	7
	Weed control in corn - chemical? Mechanical? Or both?	GLZ	Germany	June	22
	Electrical weeding in grassland	GLZ	Germany	October	8
	Hands on IPM in weed control	DL	Denmark	May	60
	Pesticide management experiment and sowing time influence on Italian ryegrass	DL	Denmark	June	8
	Yield optimization in spring barley	DL	Denmark	October	9
	Drone technology and precision farming	VELAS	Denmark	May	18
	Weed control without using ALS herbicides	VELAS	Denmark	May	15
	Sowing dates and soil temperature	VELAS	Denmark	November	13
	Direct sowing in relation to weed control	INTIA	Spain	March	38
	Strategies to control weed grass Lolium perenne	INTIA	Spain	May	13
	Farm walk, crop protection in winter crops	TEAGASC	Ireland	February	20
	Farm walk with politicians, IPM tools practiced in the hub	TEAGASC	Ireland	March	5
	Spring crop walks, crop protection in winter wheat and barley	TEAGASC	Ireland	April	30
	Spring crop walks, crop protection in winter wheat and barley, winter beans and spring barley	TEAGASC	Ireland	May	30
	Update on IPMworks in Ireland. Also Head of DG Sante addressed the forum, future of pesticides in the EU	TEAGASC	Ireland	September	250
	IPM techniques & strategies, exchange between Irish and Danish farmers	TEAGASC	Ireland	June	21
	Agroecology day field day	SSSA	Italy	May	62
	Testing the use of a cultivator on durum wheat residues for weed control as an alternative to ploughing	SSSA	Italy	October	15
	Integrated Weed Management in arable crops	SSSA	Italy	December	83
	FarmDroid weeding robot (sand)	WUR	Netherlands	June	12
	Functional agro biodiversity in potato crops (clay)	WUR	Netherlands	June	7
	Leaf diseases in sugar beets and potatoes (sand)	WUR	Netherlands	June	12
	Resistant cultivars against *Phytophthora infestans* (clay)	WUR	Netherlands	July	6
	Evaluation of IPM strategies in 2023	WUR	Netherlands	November	18
	Holistic IPM approach in mixed farming system	JHI	Scotland UK	March	25
	Ecological focus areas in field margins	JHI	Scotland UK	June	6
	Targeted application and spray technology	JHI	Scotland UK	May	4
	Intercropping and pest management	JHI	Scotland UK	July	300
	Impact companion crop on WOSR	JHI	Scotland UK	July	7
	Electrical/non-chemical potato haulm destruction	JHI	Scotland UK	August	630
	Results in field comparisons from the hub	JHI	Scotland UK	December	5
	Integrated pest management and certified Integrated production in sugar beat	KPODR	Poland	May	55
	Weeding and irrigation in organic farming	KPODR	Poland	June	20
	Current state of the art about IPM in several topics	KPODR	Poland	July	150
	IPM for Disease control in winter barley, location Polju Skoke	KGZS MB	Slovenia	June	14
	IPM for Disease control in winter barley, location Pesnica Ksernik	KGZS MB	Slovenia	June	14
Greenhouse	Substrate and micro-organisms for biological control (Trichoderma spp)	INAGRO	Belgium	April	13
	Powdery mildew in strawberries	INAGRO	Belgium	September	8
	Holistic IPM strategies in strawberries	INAGRO	Belgium	May	40
	Holistic IPM strategy on strawberries	INAGRO	Belgium	June	38
	Learning about IPM through peer to peer learning	INAGRO	Belgium	March	45
	Biological control Tuta absoluta	COEXPHAL	Spain	March	22
	Biodiversity in side and outside the greenhouse for pest prevention	COEXPHAL	Spain	March	16

Sector	Event title	Hub	Country	Date	Number
	Hedgerows as barriers to crop pests & sources of beneficial insects	COEXPHAL	Spain	April	14
	Biological control in cucumber crops	COEXPHAL	Spain	April	8
Orchard	Olive fly advance monitoring techniques	SSA	Italy	March	10
	Use of APP Poderi for participative olive fly monitoring	SSA	Italy	July	8
	Opportunities of digital tools for agroecology in olive growing	SSA	Italy	March	22
	Alternative weed control strategies	KGZS MB	Slovenia	June	
Vegetables	Variety selection for IPM	INAGRO	Belgium	April	4
	Variety selection, IPM and production, use of bio-foil	INAGRO	Belgium	May	21
	Mildew control in zucchini	INAGRO	Belgium	July	13
	Soil management as preventive measure in IPM	CONSULAI	Portugal	March	15
	Organic cultural practices for conventional farming	CONSULAI	Portugal	July	12
	Use of healthy starting/planting material	CONSULAI	Portugal	July	12
	Organic soil management practices to reduce use of pesticides	CONSULAI	Portugal	October	13
	Modern weed control in sugar beets	Delphy	Netherlands	May	19
	Mechanical weed control in arable crops	Delphy	Netherlands	May	15
	The future of mechanical weed control	Delphy	Netherlands	June	100
	IPM for fungal diseases in potatoes	Delphy	Netherlands	June	21
	Late blight contro in robust/resistant potato varieties	Delphy	Netherlands	July	35
	How to make arable farming emission free/robust cropping systems	Delphy	Netherlands	August	90
	Control of Barley Yellow Dward Virus (BYDV)	Delphy	Netherlands	December	55
	IPM in vegetable crops	ProAgria	Finland	February	47
	IPM measures in potato and carrot.	ProAgria	Finland	February	57
	The use of Prestop and Prestop mix biofungicide (Clonostachys rosea J1446).	ProAgria	Finland	February	24
	Reduce the use of pesticides, and the lack of pesticides for certain pests, and IPM in ground water areas	ProAgria	Finland	July	6
	Robots and skeletons in horticulture	ProAgria	Finland	August	20
	Tunnel growing and plant protection IPM	ProAgria	Finland	October	55
	Crop rotation in a horticulture farm, control of Drosophila Suzukii fly in Finland	ProAgria	Finland	December	24
	Optimal measures for cover crop cultivation in vegetable crops	Biosense	Serbia	May	10
	Soil health, use and understanding tools	Biosense	Serbia	Sepember	20
	Biostimulants as plant protection agens in the production of bell peppers	Biosense	Serbia	October	19
	Benefits of natural predators and parasites	Biosense	Serbia	October	10
	Plant protection conference	Biosense	Serbia	November	60
Vineyard	Pruning techniques in relation to IPM	FUEGA	Spain	February	35
	Precisions spraying based on pre-collected data	FUEGA	Spain	July	70
	Vineyard canopies and biodiversity in vineyards	FUEGA	Spain	July	25
	DSS for IPM in vineyards	CONSULAI	Portugal	January	14
	Preventive measures control of green leafhopper	CONSULAI	Portugal	April	16
	Crop nutrition in relation to pest management	CONSULAI	Portugal	March	14
	Sustainable strategies for cover crop management	CONSULAI	Portugal	December	11
	Weed suppression by cover crops	UA	Greece	March	35
	Results weed suppression by cover crops, follow up meeting	UA	Greece	April	35
	Non-chemical weed control, location Kiato	UA	Greece	May	35
	Non-chemical weed control, location Nemea	UA	Greece	May	35
	Precisions spraying with drones	UA	Greece	July	35
	Biological control of insects	KGZS MB	Slovenia	September	50
	Total number of visitors				3222

Realisation and planning

A cumulated total of 168 demonstrations were conducted over years 2021, 2022, 2023 (Table 1). Each Hub is expected to reach the number of 10 demo events by the end of the project. The needed number for 2024 to reach this total of 10 is added for each hub. We expect to reach a total number of at least 219 demonstrations by the end of the project, a little more than the average of 10 demonstrations per hub.

Table 1. Total number of demonstrations per hub, conducted and needed in 2024

Hub	Sector	Partner	Country	2021	2022	2023	Total 2021-2023	Needed 2024	Total expected
2	Arable	WR	NL		4	5	9	1	10
5	Arable	KPODR	PL		4	3	7	3	10
6	Arable	JHI	UK		2	7	9	1	10
9	Arable	SSSA	IT		4	3	7	0	7
11	Arable	DL	DK	3	4	3	10	0	10
12	Arable	VELAS	DK		2	3	5	5	10
13	Arable	BIOSENSE	RS		2	5	7	3	10
15	Arable	INTIA	ES		3	2	5	5	10
17	Arable	JKI	DE		4	3	7	3	10
18	Arable	GLZ	DE		1	3	4	6	10
22	Arable	Teagasc	IE		7	6	13	0	13
19	Arable, vege	KGZS MB	SL	1		4	5	5	10
4	Greenhouse	INAGRO	BE		5	5	10	0	10
16	Greenhouse	COEXPHAL	ES	3	3	4	10	0	10
10	Orchards	SSSA	IT		2	3	5	5	10
1	Vegetables	Delphy	NL			7	7	3	10
3	Vegetables	INAGRO	BE		3	3	6	4	10
8	Vegetables	Consulai	PT	3	1	4	8	2	10
20	Vegetables	ProAgria	FI		1	7	8	2	10
7	Vineyards	Consulai	PT	2	1	4	7	3	10
14	Vineyards	FEUGA	ES		3	3	6	3	9
21	Vineyards	AUA	Gr			5	5	5	10
		Totals		12	56	92	160	59	219

Specifics of demonstration events

In the next section, more specific information is provided for each demonstration event: date of the event, topic, crops, pests & weeds and a short description of the goal of the demonstration.

Arable crops

Germany, JKI

Time: March 2023

- Topic of the demonstration: Introduction of an innovative decisions support system for the efficient use of herbicides in corn and cereals
- Number of visitors: 7
- Crops: corn, wheat, barley
- Pests: Weeds in arable crops.
- IPM strategy and tools: Reduction of herbicides using a newly developed DSS "InnoHerb"
- Goal and short description of the demonstration:
  An independent advisor reported about farms which implemented the DSS "InnoHerb" to use herbicides in corn and grains more efficiently and explained its functions via a virtual farm demo online. The goal was to show participants how a DSS can be applied in different cropping systems and help the farmers to use herbicides more efficiently and in a more targeted manner in times of increasing restrictions and resistance problems in weeds.

Time: May 2023

- Topic of the demonstration: Effects of variety selection in winter wheat and oilseed rape
- Number of visitors: 19
- Crops: Winter wheat and oilseed rape
- Pests: Several in wheat and oilseed rape
- IPM strategy and tools: Reduce pesticide use by pest resistant varieties:
- Goal and short description of the demonstration:
  The use of chemical pesticides can be significantly reduced by combining different IPM practices. Especially precautionary methods such as crop rotation and the choice of varieties can significantly help to reduce the need for pesticides. The demonstration event consisted of talks of the farmer and an external expert, partly on the fields, concerning the characteristics of different varieties of winter wheat and oilseed rape

and how to combine this choice with other IPM strategies like intensive monitoring, the use of DSS´s and a broad crop rotation.

Time: June 2023

- Topic of the demonstration: Mechanical weed control in arable crops
- Number of visitors: 19
- Crops: Several, winter wheat, barley and peas
- Pests: Weeds in arable crops, general and site specific: burdock bedstraw, cornflower, cranesbill, common hemp-nettle, several grasses.
- IPM strategy and tools: Combination of harrowing, hoeing and roller hoeing
- Goal and short description of the demonstration:
  The aim of the demonstration was to show the potential of mechanical methods in weed control in different cropping systems. After explaining the cropping system of the farm where the demonstration took place, one external speaker (organic farmer) showed his practical experiences with harrowing and hoeing in different crops. He also discussed various procedures, such as different times and frequencies or even the combination of harrowing and hoeing in one path. The second external speaker presented results from trials to show the potential of various types of mechanical weeding machines before the group discussed the practical use of these machines on the fields of the farm.

Denmark, Velas

Time: May 2023

- Topic of the demonstration: Drone technology and precision farming
- Number of visitors: 18
- Crops: Rye grass for seed production and winter wheat
- Pests: Thistle and other weeds in grass seeds
- IPM strategy and tools: Demonstration of current possibilities with drone images. The drone can detect thistles, growth of ryegrass for seed production for the purpose of growth regulator and weeds in grass seeds.
- Goal and short description of the demonstration:
  It was demonstrated what you can do with a drone with the goal of more precise and reduced use of pesticides, and to avoid application where it is not necessary. The drone took the photos, and the associated program to the drone produces a prescription map, which the field sprayer can spray according to.

Time: April 2023

- Topic of the demonstration: weed control without using ALS herbicides
- Number of visitors: 15
- Crops: Spring barley
- Pests: Broad leaf weeds
- IPM strategy and tools: Minimum use of ALS herbicides, to avoid the further development of resistant weed species
- Goal and short description of the demonstration:
  We suspect broadleaf weeds to be resistant to ALS, but it turned out to be a warning. We must be very careful with the use of ALS, and only use it when necessary. Weed in spring barley can be controlled without ALS, but with the risk of a few other species.

Time: November 2023

- Topic of the demonstration: Sowing dates and soil temperature
- Number of visitors: 13
- Crops: winter wheat
- Pests: grass weeds, especially Italian ryegrass
- IPM strategy and tools: reduce problems through late sowing date
- Goal and short description of the demonstration:
  Late sowing date will delay the emergence of weeds, and especially grass weed, due to shorter days and decay of seed. We do not know much about soil temperature and emergence of Italian ryegrass, which we are testing in this demo. We will count the weed in the different areas spring 2024 and see if the sowing date and soil temperature makes a difference.

Netherlands, WUR

Time: June 2023

- Topic: FarmDroid weeding robot (sand)
- Number of visitors: 12
- Crops: sugar beet and chicory
- Pests and or weeds addressed in the demonstration: annual weeds
- IPM strategy and tools demonstrated: FarmDroid weeding robot and the integration of the robot in the general weed management strategy for sugar beet and chicory.

- Goal and short description of the demonstration:
  The use of the FarmDroid seeding and weeding robot was demonstrated in a sugar beet crop, with focus on the implementation of the robot into the cropping system as a whole. We actively used the pillars of our ICM model to discuss the current application of this robot with the farmers, who had many ideas on how to improve the efficacy of the weeding robot by altering other crop management decisions (irrigation, fertilization, use of herbicides). We offered a lunch beforehand, making interaction on other topics possible as well. We arranged a videographer to make a video, as a nice way to allow the farmer to share his success and questions with a broader public. Additionally, it allows us as coaches to show that these kind of demo events are really helpful to our hub farmers.

Time: June 2023

- Topic: FAB in potato crops (clay)
- Number of visitors: 7
- Crops: potato
- Pests and or weeds addressed in the demonstration: aphids and virus transmission
- IPM strategy and tools demonstrated: the use of companion and banker plants
- Goal and short description of the demonstration:
  The farm has been experimenting with banker plants to attract beneficial insects that can help control the population of aphids in his potato crops. This demo was monitored to generate more insight in the effects of randomly sown flowers on aphid control. During the demo visit the sowing method was discussed and the group reflected on the impact of such measures for other management factors such as weed control. Having some first data on the numbers of predators and aphids, together with the explanation by an expert on functional agrobiodiversity, helped to discuss the underlying mechanisms of these companion plants.

Time: June 2023

- Topic: Leaf diseases in sugar beets and potatoes (sand)
- Number of visitors: 12
- Crops: sugar beet and potato
- Pests and or weeds addressed in the demonstration: leaf diseases
- IPM strategy and tools demonstrated: diverse measures for control of leaf diseases, varieties, DSS and impact of fertilization.

- Goal and short description of the demonstration:
  Combination of two demos of two separate hub farmers on a similar topic (leaf diseases) into one event. This means that attendees could have interaction about the application of similar principles in different crops, locations and settings. This has helped to have a balanced discussion on the measures taken and ideas that come from that. We focused on both *Phytophthora infestans* and *Cercospora beticola* in potato and sugar beet respectively. To combine the actual farm demo with knowledge sharing, a researcher from IRS (research institute for sugar beets) was invited to present and have a discussion about the use of robust varieties in combination with DSS and fungicide schemes in sugar beet.

Time: July 2023

- Topic: Resistant cultivars against *Phytophthora infestans* (clay)
- Number of visitors: 6
- Crops: table potatoes
- Pests and or weeds addressed in the demonstration: *Phytophthora infestans*
- IPM strategy and tools demonstrated: Use of resistant cultivars in relation to fungicide use
- Goal and short description of the demonstration:
  To demonstrate the potential of *PI*-resistant potato cultivars the hub farmer set up a small demo trial, with a cultivar containing 2 R-genes accompanied by two different cultivars with one of both these R-genes. The idea was to adjust fungicide applications for the cultivar with 2 R-genes according to observations on PI infection in one or both the single-gene cultivars. As a result of extreme infestations levels due to weather conditions, all cultivars were treated similarly. However, the cultivar with double R-genes did perform better in terms of PI damage and this led to a fruitful discussion in the field. Farmers were able to reflect on potential strategies if conditions would have been better.

Time: November 2023

- Topic: Evaluation of IPM strategies in 2023
- Number of visitors: 18
- Crops: potato, sugar beet, onion, chicory, and general
- Pests and or weeds addressed in the demonstration: weeds, leaf diseases, aphids and PVY.

- IPM strategy and tools demonstrated: use of pesticides within holistic IPM strategies, the FarmDroid weeding robot, the use of functional agrobiodiversity for pest control, cultivar choice in relation to resistance management.
- Goal and short description of the demonstration:
  The hub coaches (and involved advisors) prepared a short presentation on the different farm demos and the IPM-based strategy implemented, together with the farmers. We also involved Simon Lox to give a presentation on the further work that is being done within IPMWORKS, so the hub participants get a broader view on the project outcomes and activities. The interaction between the two separate hubs was also refreshing and greatly appreciated by our hub farmers.

Spain, INTIA

Time: 3 March 2023

- Topic of the demonstration: Direct sowing
- Number of visitors: 38
- Crops: wheat and barley
- Pests: *Lolium, Bromus, Papaver, sinapis, veronica*
- IPM strategy and tools: Basic principles, advantages and disadvantages of direct sowing. Real experiences of two local farmers
- Goal and short description of the demonstration:
  To enable farmers to opt for a change in the management of extensive farming with adaptations to the new PAC while maintaining profitability and reducing environmental impact.

Time: 8 May 2023

- Topic of the demonstration: Strategies to control Lolium
- Number of visitors: 13
- Crops: wheat, barley and sunflower
- Pests: grass weed *Lolium perenne*
- IPM strategy and tools: Strategies to control *Lolium*, direct sowing
- Goal and short description of the demonstration:
  Visit to different trials on *Lolium* strategies control, organic fertilizer on cereal and sunflower plots in direct sowing. To sum up, share farmer experience in these topics.

Poland, KPODR

Time: 25 May 2023

- Topic of the demonstration: Integrated pest management and certified Integrated production in sugar beet, use of cover crops and endophytic beneficial fungi in winter wheat
- Number of visitors: 55
- Crops: sugar beet, winter wheat, fungal diseases in wheat
- Pests: weeds, *Cercospora beticola*
- IPM strategy and tools: dug up soil profile, variety selection, cover crops, active substance selection, microdosing, harrowing, weeding and fertilization strategy, use of cereals mixtures and procedures required for Integrated Production certificate and use of endophytic beneficial fungi
- Goal and short description of the demonstration:
  Presentation and popularization of Integrated Pest Management and certified Integrated production (quality label) in sugar beet, and use of cover crops and endophytic beneficial fungi in winter wheat. Topic was presented by the farmer on a field walk, and later concluded with multimedia presentations indoors with Q&A session.

Time: 12 June 2023

- Topic of the demonstration: Weeding and irrigation in organic farming
- Number of visitors: 20
- Crops: wheat, black cumin, false flax, soybeans
- Pests: Weeds, birds in soya
- IPM strategy and tools: Holistic strategy in an ecological farm with irrigation system on diversified crop rotation, mechanical weeding, different sowing dates for soybeans
- Goal and short description of the demonstration:
  Provide overview of mechanical and other (non-chemical) methods of weeding in organic farming with presentation of farm, irrigation system, crop rotation and mechanical weeding. Field walk with oral presentation by the farmer, concluded by an indoor presentation from professor of organic agriculture on the topic of weed management.

Time: 1 and 2 July 2023

- Topic of the demonstration: Current state of the art in several topics: Organic farming, how to grow herbal plants, Plant diseases and their recognition, Practical use of UV radiation and multispectral lens in agriculture, Plant pests and their recognition
- Number of visitors: 150
- Crops: Cereals, oilseed rape, sugar beat
- Pests: fungal and bacterial diseases inoculated beforehand on test plots, samples of conserved pest (bugs) for recognition practice
- IPM strategy and tools: Deepening knowledge on pest thresholds and biology, organic farming solutions and use of UV cameras in agriculture
- Goal and short description of the demonstration:
  Presentation of several different topics in form of medium group on field live seminars with Q&A facilitated by experts from Polytechnic of Bydgoszcz on Field Days in Minikowo and AGRO-TECH fair.

Italy, SSSA

Time: 30 May 2023

- Topic of the demonstration: "Agroecology day": Field day
- Number of visitors: 62
- Crops: Vicia and Lathyrus species, lentil and chickpea intercropped with oat, soft wheat and durum wheat
- Pests: Weeds in general,
- IPM strategy and tools: genetic diversification, crops diversification, landscape diversification, intercropping
- Goal and short description of the demonstration:
  Field Day to see holistic IPM and agroecology in practice, based on three themes: genetic diversification, crop diversification, landscape diversification with lots of different trials where every trial had an expert with a poster to summarize the outcome/project of the experiment

Time: 27 October 2023

- Topic of the demonstration: Testing the use of a cultivator on durum wheat residues as an alternative to ploughing
- Number of visitors: 15

- Crops: durum wheat and forage crops (on hilly terrain)
- Pests: weeds in general
- IPM strategy and tools: weeds management in different organic agriculture systems (ploughing, cultivator use)
- Goal and short description of the demonstration:
  Watching in field functioning of the cultivator Karat 9 on durum wheat residues after harvest. Discussing its use in a holistic IPM weed management, based on the management of the weed seed bank with proper timing and depth of soil tillage, in a farm producing winter cereals and forage crops on the hills.

Time: 21 December 2023

- Topic of the demonstration: Integrated Weed Management (IWM) in arable crops, experiences made by research and by IPMWORKS farmers
- Number of visitors: 28 +55 online
- Crops: winter cereals (durum wheat, soft wheat, emmer), sunflower, chickpea, lentil, forage crops (Egyptian clover, Italian ryegrass, Italian sainfoin), maize, rapeseed
- Pests: Weeds - Italian ryegrass, Phalaris paradoxa, Echinocloa crus-galli, Chenopodium album, Sinapis arvensis
- IPM strategy and tools: Use of cover crops; Intercropping; How to reduce herbicide usage and prevent herbicide resistance in weeds.
- Goal and short description of the demonstration:
  Integrated Weed Management (IWM) in arable crops, experiences made by research and the farmers. The seminar was done with a first part of presentations by farmers/experts, and the second part organized as a round table with some farmers and other participants.

Denmark, DL

Time: 16 May 2023

- Topic of the demonstration: Hands on IPM
- Number of visitors: 60
- Crops: conventional: Peas, winter wheat, spring barley, red fescue (for seed)
  organic: strawberries
- Pests: Italian ryegrass and other weeds, Leaf edge beetles in peas, Shell weevils in rapeseed, Thrips in rye

- IPM strategy and tools: Mechanical weeding, weeding with robot, biodiversity hedgerows use, usage of warning systems on the farm, crop rotation, Weeding/removal of grass weeds around flowering, strategic tillage, untouched stubble from harvest to sowing, early sowing of wither cereals, use of precision technology, e.g. graduated liming/fertilizing/sowing/plant protection, variety mixtures use, clean harvesting machines and harvest order
- Goal and short description of the demonstration:
  The goal of the demonstration was to show to a large number of farmers how to apply IPM principles in the everyday management in several crops. As well as demonstration of weeding robot in action, promotion of biodiversity hedgerows, optimisation of tillage in combating weeds, precise application and use of NDVI, use of variety mixtures. Participants had opportunity to witness weeding robot in action on one field and benefits of establishing hedgerows on others, with discussion of participants and the hub coach along the way.

Time: 19 June 2023

- Topic of the demonstration: Pesticide management experiment and sowing time influence on Italian ryegrass
- Number of visitors: 8
- Crops: winter wheat, spring barley, red fescue for seed, oil seed rape.
- Pests: Weeds, Italian ryegrass
- IPM strategy and tools: Stage of weed development, pesticide use reduction, optimal timing of herbicide application and mechanical weeding of resistant leftover weeds
- Goal and short description of the demonstration:
  The goal of the demonstration was to demonstrate and discuss the development of weed population on a farm with Ital. ryegrass problems, where the advisor has field visits every second week during the growing season.

Time: 06 October 2023

- Topic of the demonstration: Yield optimization in spring barley
- Number of visitors: 9
- Crops: Spring barley
- Pests: weeds
- IPM strategy and tools: Sowing techniques, techniques to improve fertilizer application and techniques to reduce the reliance on pesticides

- Goal and short description of the demonstration:
  Yield optimization in spring barley, promotion of crop rotation. Moderated workshop and discussion with post-it on crucial aspect of spring barley production aiming to minimize pesticide reliance.

Germany, GLZ

Time: 01 March 2023

- Topic of the demonstration: Functionality and use of the Decision Support System InnoHerb
- Number of visitors: 7
- Crops: Winter wheat, winter barley, winter rye and maize
- Pests: Wireworms, weeds in general
- IPM strategy and tools: Economic damage thresholds, DSS tool, weed resistance avoidance, reducing herbicides, pesticides and costs by using DSS
- Goal and short description of the demonstration:
  The aim of the demo was to provide a practicable and reliable DSS via the Internet in order to be able to apply herbicides more efficiently and in a more targeted manner. This will directly promote economic efficiency and use of resources in the most important arable crops in Germany. In addition, the InnoHerb program can be a planning tool for official and private advisory services to develop herbicide strategies, for example in the case of resistance problems or in water protection areas. InnoHerb can also play an important role in the implementation of the weed threshold concept in agricultural practice.

Time: 27 June 2023

- Topic of the demonstration: Weed control in corn - chemical? Mechanical? Or both?
- Number of visitors: 22
- Crops: maize
- Pests: Wireworm, Oscinella frit, seed fly, weeds in maize
- IPM strategy and tools: mechanical weeding (finger weeder and hoe), choosing optimal strategy, combining chemical with mechanic weeding
- Goal and short description of the demonstration:
  Two mechanical methods of weed control in maize were demonstrated: hoe with camera control and GPS-supported Section Control from Steketee and intensive harrow GreenMaster from Güttlerand. The possibilities of combining chemical and mechanical

weed control were presented and compared. The demo day ended with a facilitated exchange of experience between both organic and conventional practitioners.

Time: 10 October 2023

- Topic of the demonstration: Technology for precision weeding in grassland
- Number of visitors: 8
- Crops: grasslands
- Pests: weeds, Broad-leaved dock (*Rumex obtusifolius*)
- IPM strategy and tools: Spot spraying in comparison with conventional herbicide use
- Goal and short description of the demonstration:
  Effect and comparison of the presented techniques: The RumboJet 880, developed by Allgäu Automation, is designed to enable selective dock control on permanent grassland with a high area output. The dock plants are detected with multispectral camera and sprayed with the active ingredient in a single operation. During the event effects of convectional and spot spraying were compared and discussed with participants.

Ireland, Teagasc

Time: 23 February 2023

- Topic of the demonstration: Holistic Integrated Weed Management
- Number of visitors: 20
- Crops: winter wheat, winter barley, spring beans and winter oilseed rape
- Pests: Weeds, Italian ryegrass in particular
- IPM strategy and tools: cover cropping, crop rotation both spring and winter, rotation of herbicides, and hand rouging the remaining plants where possible
- Goal and short description of the demonstration:
  The demo event took the form of a field walk, and presentation/discussion of IPM techniques that will control grass weeds, especially Italian Ryegrass which has started to become a problem in Ireland. The farmer has a small population on the farm which have been resistance tested, so we know currently which herbicides can be used to control his population, and how to combine chemical treatments with other weed management measures.

Time: 27 March 2023

- Topic of the demonstration: Farm walk with politicians, IPM tools practiced in the hub

- Number of visitors: 5
- Crops: Winter wheat, winter barley, winter oilseed rape
- Pests: Weeds and fungal diseases
- IPM strategy and tools: Regenerative farming, Cover cropping, rotation, biological farming, reduced input system, crops monitoring, bio-stimulants, stale seed bed and direct drilling
- Goal and short description of the demonstration:
  This event was designed at the behest of EU politicians who were interested to see how IPM tools work in Ireland. They were interested to see the usefulness and the limitations of IPM in an Irish context whereby the mild maritime climate is ideal for wet weather diseases and pests.

Time: 04 April 2023 Cork

- Topic of the demonstration: Field walk to demonstrate holistic IPM
- Number of visitors: 30
- Crops: winter wheat and barley
- Pests: Weeds in general
- IPM strategy and tools: Cover crops, sowing date, species mix, reduced cultivation
- Goal and short description of the demonstration:
  The goal was to demonstrate the use of cover crops in trapping nutrients, controlling weeds and pests, while also making the soil easier to work. Also, establishment systems were demonstrated along with their effects on the weed spectrum of the fields.

Time: 08 May 2023 Wexford

- Topic of the demonstration: Spring walks and demonstration of holistic IPM
- Number of visitors: 30
- Crops: winter wheat and barley, winter beans and spring barley
- Pests: Weeds in general
- IPM strategy and tools: Cover crops, sowing date, species mix, reduced cultivation
- Goal and short description of the demonstration:
  The goal was to demonstrate the use of cover crops in trapping nutrients, controlling weeds and pests, while also making the soil easier to work. Also, establishment systems were demonstrated along with their effect on the weed spectrum of the fields.

Time: 8 September 2023, Wexford

- Topic of the demonstration: Update on IPMWORKS in Ireland. The Head of DG Sante addressed the forum, future of pesticides in the EU
- Number of visitors: 250
- Crops: Spring and winter barley and catch crops
- Pests: all pests in the rotation
- IPM strategy and tools: crop rotation, cover crops, biological farming, reduced input systems, using tolerant cultivars, aphid monitoring, reduced cultivation systems
- Goal and short description of the demonstration:
  The objective of this meeting was to demonstrate the different types of IPM that we use in Ireland and how this can help farmers to overcome the particular issues on each of the IPMWORKS demo farms.

Time: 6-7 June 2023

- Topic of the demonstration: IPM techniques & strategies, exchange between Irish and Danish farmers
- Number of visitors: 21
- Crops: Winter wheat winter barley, spring barley oilseed rape and spring beans
- Pests: all pests that occur in the rotational crops
- IPM strategy and tools: Cover cropping, crop rotation, resistance testing, land rotation with other farmers, increased seed rates
- Goal and short description of the demonstration:
  Demonstration of the role of IPM on Irish farms and comparison of issues with Danish hub members. Discussions about how improvements can be made in both countries to solve pest issues. Demonstration on how using as many tools as possible before using a pesticide helped to reduce the pest burden and hence the reliance on chemical pesticides, although there would still be a need for them.

Scotland, JHI

Time: 14 March 2023

- Topic of the demonstration: Holistic IPM approach
- Number of visitors: 25
- Crops: Arable crops in combination with livestock.
- Pests and or weeds addressed in the demonstration: weeds and pests

- IPM strategy and tools demonstrated: Benefits of including livestock in an arable rotation.
- Goal and short description of the demonstration:
  Benefits and challenges of holistic approach to farm management with livestock discussed with the participants. Opportunities for arable farms to add animals. Cover crops for grazing and place in rotation. Extended rotations. Using livestock to suppress weeds/regulate growth. Soil health and economic aspects evaluated.

Time: 30 May 2023

- Topic of the demonstration: Targeted application and spray technology.
- Number of visitors: 4
- Crops: crops in general.
- Pests and or weeds addressed in the demonstration: various
- IPM strategy and tools demonstrated: Application technology.
- Goal and short description of the demonstration:
  To demonstrate practical examples where embracing new technology can reduce the use of PPP's. Showing give 'quick wins' with mature technology and others which need a more considered approach. Summary presented from industry workshop attendance earlier in month. Targeted nozzle technologies, machine learning of image identification and facilitating reduced doses and pesticide loadings were addressed in the demonstration.

Time: 16 June 2023

- Topic of the demonstration: Ecological focus areas.
- Number of visitors: 6
- Crops: all crops in the rotation and potato in particular.
- Pests and or weeds addressed in the demonstration: pests in general
- IPM strategy and tools demonstrated: Using ecological focus areas (EFA) in field margins to benefit the farm system.
- Goal and short description of the demonstration:
  Farm visit with a mixed farming approach within a traditional system including livestock and extended crop rotation. EFA areas used within fields to benefit overall system. Strategic use of flowering margins for improvements in soil structure, pollinator and beneficial predator habitat and reducing soil erosion in potato fields.

Time: 4 July 2023

- Topic of the demonstration: Intercropping.
- Number of visitors: 300
- Crops: all crops in the rotation.
- Pests and or weeds addressed in the demonstration: pests in general
- IPM strategy and tools demonstrated: Role of intercrops in reducing need for N application and limiting disease incidence. Alternative weed control methods being developed in prototype form
- Goal and short description of the demonstration:
  Field plots to show differences in weed control and disease incidence comparing cereal/legume intercrops vs monocultures. Use of intercrops in rotation to reduce need for PPP use and reduce the applications of synthetic fertiliser. Prototype steam weeding machine at stand to show to visitors, not for practical demonstration.

Time: 14 July 2023

- Topic of the demonstration: Impact companion crop on WOSR.
- Number of visitors: 7
- Crops: winter oil seed rape.
- Pests and or weeds addressed in the demonstration: weeds mainly
- IPM strategy and tools demonstrated: Use of companion crops (buckwheat&clover) in WOSR
- Goal and short description of the demonstration:
  Update on in-field comparison measurements taken from the autumn and evaluating effect of companion crop on WOSR establishment. Discussion on future possibilities, suggestions for farmer and breakdown of costs before harvest. Targeted applications of PPP for effective results, where timing is considered more important than treatment load. Use of agroecological practices where there is a net benefit to productivity.

Time: 10 August 2023

- Topic of the demonstration: Electrical haulm destruction.
- Number of visitors: 630
- Crops: potato.
- Pests and or weeds addressed in the demonstration: potato foliage

- IPM strategy and tools demonstrated: Use of electricity for foliage killing instead of using herbicides
- Goal and short description of the demonstration:
  Working demonstration of electrical haulm destruction using a Nufarm/CropZone Nucrop machine as part of the Potatoes in Practice event. Comparison of techniques using electricity only, PPP only and an integrated method combining both.

Time: 14 December 2023

- Topic of the demonstration: In-field comparisons from the hub.
- Number of visitors: 5
- Crops: winter wheat and winter oil seed rape
- Pests and or weeds addressed in the demonstration: weeds mainly
- IPM strategy and tools demonstrated: measures to replace pesticides wherever possible.
- Goal and short description of the demonstration:
  Summary of results from In-Field Comparisons carried out in hub in the previous year. Performance of reduced fungicide vs conventional in winter wheat and evaluating effect and economic impact of companion crop establishment in WOSR. Use of elicitor, foliar nutrition and bio-stimulant in winter wheat to replace PPP wherever possible. WOSR - eliminate residual herbicide and seedbed fertiliser use in autumn, add companion plants of Egyptian clover and buckwheat. Alternative PPP and low risk products to achieve effective disease control in winter wheat. Companion cropping effect on cabbage stem flea beetle and overall reduction of PPP use.

Spain, INTIA

Time: 03 March 2023

- Topic of the demonstration: Direct sowing
- Number of visitors: 38
- Crops: Arable crops (wheat and barley)
- Pests and or weeds addressed in the demonstration. *Weeds: Lolium, Bromus, Papaver, sinapis, veronica*.
- IPM strategy and tools: Basic principles, advantages and disadvantages of direct sowing in weed control. Real experiences of two local farmers.

- Goal and short description of the demonstration:
  To enable farmers to opt for a change in the management of extensive farming with adaptations to the new PAC while maintaining profitability and reducing environmental impacts.

Time: 8 May 2023

- Topic: Strategies to control Lolium
- Number of visitors: 13
- Crops: Arable crops (wheat, barley and sunflower)
- Pests and or weeds addressed in the demonstration: *Lolium perenne*.
- IPM strategy and tools: Strategies to control *Lolium*, direct sowing.
- Goal and short description of the demonstration:
  Visit to different trials on *Lolium* strategies control, organic fertilizer on cereal and sunflower plots in direct sowing. To sum up, share farmer experience in these topics.

Slovenia, KGZS MB (cross sector hub)

Time: 2 June 2023, first location (Polju Skoke)

- Topic of the demonstration: Optimization of the control of diseases in winter barley
- Number of visitors: 14
- Crops: winter barley
- Pests: Fungal diseases in barley: Ramularia collo-cygni and Pyrenophora teres
- IPM strategy and tools: control according to need and anti-resistance strategy, preventive measure regarding the resistance of fungi to fungicides.
- Goal and short description of the demonstration:
  Field demonstration of control strategies according to real need, taking weather circumstances into consideration. As a consequence, the number of fungicide applications could be reduced compared to standard practices.

Time: 2 June 2023, second location (Pesnica Ksernik)

- Topic of the demonstration: Diseases in winter barley
- Number of visitors: 14
- Crops: winter barley
- Pests: Fungal diseases in barley: Ramularia collo-cygni and Pyrenophora teres

- IPM strategy and tools: control according to need and anti-resistance strategy, preventive measure regarding the resistance of fungi to fungicides.
- Goal and short description of the demonstration:
  Field demonstration of control strategies according to real need, taking weather circumstances into consideration. As a consequence, the number of fungicide applications could be reduced compared to standard practices.

Greenhouse crops

Spain, COEXPHAL

Time: March 2023

- Topic of the demonstration: biological control
- Number of visitors: 22
- Crops: Tomato
- Pests: Tuta absoluta
- IPM strategy and tools: Non-chemical control of the pest
- Goal and short description of the demonstration:
  Using light traps is a good way to significantly reduce Tuta absoluta damage, but it is better if you combine it with other IPM elements: Biocontrol with Nesidiocoris tenuis in combination with approximately 20 light traps per hectare. Also, because of the low use of pesticides in this strategy, spontaneous parasitoid species (Necremnus sp.) are normally present in the greenhouse and help to control Tuta absoluta.

Time: March 2023

- Topic of the demonstration: Biodiversity inside and outside the greenhouse for prevention
- Number of visitors: 16
- Crops: several greenhouse crops
- Pests: Aphids in greenhouse crops
- IPM strategy and tools: Biodiversity conservation as strategy to prevent aphids to become a problem in greenhouses without using chemical insecticides
- Goal and short description of the demonstration:
  Conservation biological control in and outside the greenhouse by a large diversity of plant species in flower strips and innundative releases of natural enemies, particularly syrphid flies, lacewings and parasitic wasps (Aphidius sp.) to control aphids.

Time: April 2023

- Topic of the demonstration: Hedgerows as barriers to crop pests & sources of beneficial insects
- Number of visitors: 14
- Crops: Greenhouse crops in the region
- Pests: Insects
- IPM strategy and tools: Flower strips, hedgerows and specific management of aphids.
- Goal and short description of the demonstration:
  Biodiversity conservation is the best strategy to prevent pest-related issues. In this demonstration, the focus was on the outside the greenhouse, with the use (and design) of hedgerows.

Time: April 2023

- Topic of the demonstration: Biological control in cucumber crops
- Number of visitors: 8
- Crops: Cucumber
- Pests: Insects
- IPM strategy and tools: Biological control, sticky traps, flower strips and bio-insecticides
- Goal and short description of the demonstration:
  The goal was to demonstrate the strategy used by the IPMWORKS farmer for non-chemical control of insects in cucumbers. The timing for the demo was a key point here, to be able to check and see the impact of auxiliary insects on pests. For this goal the crop was monitored from the start, including the abundance of pests and natural enemies. By organising the demonstration during the optimal time window (when the effect of beneficials could clearly be seen), a maximized impact on the participants was achieved.

Belgium, INAGRO

Time: April 2023

- Topic of the demonstration: Substrate and micro-organisms for biological control (Trichoderma spp)
- Number of visitors: 13
- Crops: strawberry
- Pests: Micro-organisms in the plant substrate
- IPM strategy and tools:

- Goal and short description of the demonstration:
  Farm visit, including a presentation and a farm walk. For plant nursery: Trichoderma in substrate, spraying applications against pests and diseases. Plant production: predatory mites against thrips and spidermite and spraying applications against grey mold and powdery mildew

Time: 28 September 2023

- Topic of the demonstration: Powdery mildew in strawberries
- Number of visitors: 8
- Crops: strawberries
- Pests: powdery mildew
- IPM strategy and tools: UV-C against powdery mildew, beneficials against aphids, use of banker plants and variety choice
- Goal and short description of the demonstration:
  Group visit to the farm of a strawberry grower, using several techniques for pest control. Farm walk to show and discuss the result of the different techniques.

Time: 30 June 2023

- Topic of the demonstration: holistic IPM strategy in strawberries
- Number of visitors: 38
- Crops: Strawberries
- Pests: aphids and powdery mildew
- IPM strategy and tools: biological control, varieties, beneficials, DSS
- Goal and short description of the demonstration:
  Farm walk in groups of maximum 15 persons for intense interactions. Demonstrated are biocontrol agents against thrips, monitoring of spidermite and aphids. Fungicides or alternative fungicides against grey mold and powdery mildew. Bankerplants and flowerstrips to stimulate natural enemies. Selection of varieties that are more resistant against diseases.

Time: 23 May 2023

- Topic of the demonstration: Holistic IPM strategy on strawberries
- Number of visitors: 40
- Crops: Strawberries
- Pests: Several pests

- IPM strategy and tools: Variety choice, beneficials, targeted pesticide use
- Goal and short description of the demonstration:
  To demonstrate a holistic IPM strategy in strawberries to agricultural policy representatives, based on several measures against at range of pests and diseases.

Time: 17 March 2023

- Topic of the demonstration: learning about IPM through peer-to-peer learning
- Number of visitors: 45
- Crops: Strawberries
- Pests: insects and fungal diseases
- IPM strategy and tools: variety choice, biological control, flying doctors
- Goal and short description of the demonstration:
  Demonstration of peer-to-peer learning with a group of students, looking at biological control measures on a farm: 'flying doctors (bees bringing antagonists to Botrytis cinerea to strawberry flowers), trapping thrips and *D. suzukii*.

Orchards

Italy, SSSA

Time: 25 March 2023

- Topic of the demonstration: Olive fly advance monitoring techniques, optimization of decision making by using Decision Support Systems
- Number of visitors: 10
- Crops: Olives
- Pests: Olive fly
- IPM strategy and tools: monitoring techniques, powder rocks to prevent olive fly attack; pheromone traps to monitor olive fly population
- Goal and short description of the demonstration:
  To show importance of monitoring the presence of the pest and become autonomous in the valuation of the opportunity to treat or not, introduction to digital tools followed by discussion and Q&A

Time: 17 July 2023

- Topic of the demonstration: Use of APP Poderi for participative olive fly monitoring
- Number of visitors: 8
- Crops: Olives
- Pests: Olive fly
- IPM strategy and tools: monitoring techniques, powder rocks to prevent olive fly attack; pheromone traps to monitor olive fly population
- Goal and short description of the demonstration:
  Use and evaluation of APP Poderi technology, which supports farmers to integrate participatory monitoring and provides personalized help to farmers decision. The event was organized as a response to a hub need to monitor olive fly for a control without chemicals, involving more the farmers in monitoring process, as well as interaction with the PATH2DEA Project.

Time: 25 March 2023

- Topic of the demonstration: Opportunities of digital tools for agroecology in olive growing
- Number of visitors: 22
- Crops: Olives
- Pests: Olive fly
- IPM strategy and tools: beginning of a path to awareness on the need to make shared decisions among olive growers
- Goal and short description of the demonstration:
  Analysis of utilities, barriers, risks and trends of digitalization for agroecology and olive growing with a prospect to future collaboration, in continuity with the years of the project. We aimed at stimulating farmers themselves to be promoters of the effective training that leads to shared decisions at area level.

Slovenia, KGZS MB

Time: 19 June 2023

- Topic of the demonstration: Alternative weed control strategies
- Number of visitors: unknown
- Crops: Apple orchard
- Pests: Weeds

- IPM strategy and tools: Non-chemical weed control to reduce herbicide use, by growing alternative crops in the orchard.
- Goal and short description of the demonstration:
  The goal of the demonstration event was to show farmers different alternative approaches to herbicide use. In 2023 we focused on promising results. Annual and perennial flowers and low soybeans were sown to suppress weeds. None of the undersown plants had a negative influence on the apple trees.

Outdoor vegetables

Netherlands, Delphy

Time: May 2023

- Topic of the demonstration: Modern weed control in sugar beets
- Number of visitors: 19
- Crops: Sugar beets
- Pests: Weeds
- IPM strategy and tools: Mechanical weed control with the robot from Farmdroid in combination with spot spraying.
- Goal and short description of the demonstration:
  Weed control in sugar beets on most farms is still chemical. Part of the growers mechanically control weeds in between the beet rows. One of the hub members bought a Farmdroid robot. The robot sows seed on GPS location, the location is stored in the memory of the robot. The robot uses this information for mechanical weed control in and between the beet rows. The spot around the seeds is treated with herbicides by a spot sprayer. In this way only 10% of the total area is treated with herbicides. This approach can also work well in chicory.

Time: May 2023

- Topic of the demonstration: Mechanical weed control in arable crops
- Number of visitors: 15
- Crops: Several crops
- Pests: Weeds
- IPM strategy and tools: Mechanical weed control options.
- Goal and short description of the demonstration:
  Weed control strategies based on just herbicides leads to more and more problems in arable crops. The number of herbicides gets lower and lower, more and more ‘problem’ weeds occur. Mechanical weed control is a good addition to herbicide use. The focus in

the demonstration was on hoeing machines. GPS steered equipment enables faster driving and a high capacity, and the option to work close to the crop rows.

Time: June 23

- Topic of the demonstration: The future of mechanical weed control
- Number of visitors: 100

- Crops: focus on sugar beets, onions and potatoes
- Pests: Weeds
- IPM strategy and tools: More and more herbicides are banned from the market, especially in crops with relatively low acreages, e.g. onions. In other crops, specific weeds are hard to control with the available herbicides. Mechanical weed control is an effective way and good alternative to control weeds. Many new machinery and equipment come to the market.
- Goal and short description of the demonstration:
  Demonstrate the opportunities for the future of weed control. Modern harrowing and hoeing techniques and robots. The weather conditions were perfect for mechanical weeding. After an introduction to robotisation in agriculture, the approximately 100 participants were divided into groups and shown around the seven types of solutions. For each object, an explanation was given about the working method and a small demonstration was held. After this it was possible to ask questions and discuss.

Time: June 2023

- Topic of the demonstration: Fungal diseases in potatoes
- Number of visitors: 21
- Crops: Potatoes
- Pests: Late & early blight in potatoes
- IPM strategy and tools: The use of DSS for informed decision making
- Goal and short description of the demonstration:
  Early and late blight are the major threat in potatoes, and many fungicide applications are used to control these fungal diseases. Decisions Support Systems (DSS) can help the decision for the optimal timing and frequency of applications. On the IPM-Decisions platform, DSS for these diseases are running. The platform and DSS were explained. The DSS for early blight (Tomcast) is developed and tested by Nibio in Norway. The added value of this system for The Netherlands was discussed with the participants.

Time: July 2023

- Topic of the demonstration: robust/resistant late blight potato varieties
- Number of visitors: 35
- Crops: Potatoes
- Pests: Late blight in potato
- IPM strategy and tools: Use resistant/robust varieties
- Goal and short description of the demonstration:
  The perspective of robust varieties was explained to the participants. But also, the need to manage such crops very carefully was made clear. Bad management creates the risk that the resistance is broken by new late blight strains. To preserve the resistance, organic growers should kill the crop as soon as the first late blight infection occurs. And conventional growers should spray the crop in case of high infection risk. DSS for late blight need to be adapted for 'conventional' management of these resistant varieties.

Time: August 2023

- Topic of the demonstration: How to make arable farming emission free/robust cropping systems
- Number of visitors: 90
- Crops: Arable crops, focus on potatoes
- Pests: Pests in general
- IPM strategy and tools: Several elements of a robust and resilient cropping system.
- Goal and short description of the demonstration:
  The Dutch policy is aiming for the development of robust and resilient cropping systems, lowering the need for and dependency on chemical pesticides. Such a strategy asks for a series of measures, on strategic, tactic and operational level. Focus in the event was on robust varieties, mechanical weed control and the use of DSS for disease control.

Time: December 2023

- Topic of the demonstration: control of Barley Yellow Dward Virus (BYDV)
- Number of visitors: 55
- Crops: Winter barley and winter wheat
- Pests: Aphids and BYDV
- IPM strategy and tools: Delayed sowing, robust varieties, use of DSS of aphid control
- Goal and short description of the demonstration:
  This was an online webinar. BYDV can cause serious yield damage in winter wheat and

winter barley. The crop is infected through aphids, transferring the virus from 'outside' into the fields. Late sowing (aphids are not active in colder periods), robust varieties (less susceptible to damage) and use of a DSS were discussed with the participants. On the IPM Decisions platform a DSS for BYDV control is available. This DSS is developed in the UK and might be relevant for The Netherlands as well. The DSS was tested on a few fields of IPMWORKS hub members. Results will become available in spring 2024, as symptoms normally show up.

Finland, Pro Agria

Time: February 2023

- Topic of the demonstration: IPM in vegetable crops
- Number of visitors: 47
- Crops: Brassicas, carrot, zucchini, celery
- Pests and or weeds addressed in the demonstration: diamond moth, cabbage aphid, foreign species.
- IPM strategy and tools demonstrated: IPM now on outdoor vegetables.
- Goal and short description of the demonstration:
  History of 30 years of Finnish IPM plant protection on outdoor vegetables. Decision making, tools in history (Agronet and KasperIT) and tools now (LukeKasKas). Hub farmers example of organic outdoor vegetables IPM and decision making. Pest control according to need, verification of need by insect trapping, prediction for the near future and options to support natural enemies of vegetable pests.

Time: February 2023, IPM in future Webinar

- Topic of the demonstration: IPM measures in potato and carrot.
- Number of visitors: 57
- Crops: Potato, carrot
- Pests and or weeds addressed in the demonstration: *Echinochloa crus-galli*, potato blight, carrot storage diseases.
- IPM strategy and tools demonstrated: willow chips, species knowledge and identification.
- Goal and short description of the demonstration:
  IPM plant protection, new protection methods conducted on Natural Resources Institute Finland. Views of IPM in Finland by The Central Union of Agricultural Producers and Forest Owners (MTK). Measures presented are 1) the use of willow chips in the fight against potato diseases, potato blight, 2) the role of soil microbes and their importance

in managing carrot storage diseases and 3) the impact of foreign weed species on vegetable growing.

Time: February 2023, Soft fruit and berry farmers foundation annual meeting Webinar

- Topic of the demonstration: The use of Prestop and Prestop mix biofungicide (Clonostachys rosea J1446).
- Number of visitors: 24
- Crops: Strawberry, raspberry
- Pests addressed in the demonstration: Root diseases Pythium, Phytophthora, Fusarium, Rhizoctonia, grey mold and apple seed rot.
- IPM strategy and tools demonstrated: Use of Prestop and Prestop mix biofungicide (Clonostachys rosea J1446). New techniques as a growth promoter; oxygenation of the growing medium.
- Goal and short description of the demonstration:
  Demonstrate biological crop protection methods on raspberry and strawberry cultivation, new results from the field trials and the use of oxygen on berry tabletop cultivation.

Time: July 2023, Demonstration at Niitty-Seppälä Farm

- Topic of the demonstration: Topics covered were how to reduce the use of pesticides, the lack of pesticides for certain pests, and IPM in ground water areas.
- Number of visitors: 6
- Crops: Pod pea, strawberry, raspberry, blackberry, onion
- Pests and or weeds addressed in the demonstration: Grey mold, weeds, thrips
- IPM strategy and tools demonstrated: Holistic IPM: Free discussion and exchange of knowledge & experience about IPM plant protection.
- Goal and short description of the demonstration:
  Farmers are worried about the lack of chemical pesticides for some pests. Every year there is no approved chemical pesticides available for certain pests, or on specific locations. Farmers are worried about how they can continue commercial production without any pesticides. There is no biological plant protection for all pests. Everyone was using holistic IPM methods, for example pest monitoring, weed control by using bio-degradable soil surface coverings, mowed lawn between soft-fruit rows, harrowing, crop rotation, resistant varieties, polytunnel.

Time: August 2023, SatoBotti & IPMWORKS seminar

- Topic of the demonstration: Robots and skeletons in horticulture. Other topics were robotic weeding of pod pea (FarmDroit-robot) and main issues of plant protection 2023 in general.
- Number of visitors: 20
- Crops: tomato, pod pea, strawberry
- Pests and or weeds addressed in the demonstration: weeds
- IPM strategy and tools demonstrated: robotic weeding.
- Goal and short description of the demonstration:
  Robots and skeletons are opportunities to help to reduce the workload for weed control. Other topics were robotic weeding of pod pea (FarmDroit-robot) and specific issues of plant protection 2023 in general. Robotic weeding is interesting but small fields and machine maintenance makes farmers wonder whether it is profitable enough on fresh pea cultivation.

Time: October 2023

- Topic of the demonstration: Tunnel growing and IPM. CAP27 and IPM on berry farms.
- Number of visitors: 55
- Crops: strawberry, raspberry, blackberry, blueberry
- Pests and or weeds addressed in the demonstration: thrips, pythium and other root diseases, results of farm trials.
- IPM strategy and tools demonstrated: Growth promoters, biological root disease control measures and problems with thrips and mites.
- Goal and short description of the demonstration:
  Open field day at Peltosirkku Farm. The program of the open field day consisted of the hub coach experiences and conversations during the 2023 growing season. Main problems of tunnel berry growers were thrips, mites and root diseases. Biological control of thrips on soft fruit. The use of Prestop and Prestop mix biofungiside (Clonostachys rosea J1446). Growing media and oxygen nano bubbles.

Time: December 2023

- Topic of the demonstration: Crop rotation in a horticulture farm, control of Drosophila Suzukii fly in Finland today, Presentation of the IPMWORKS project.
- Number of visitors: 24
- Crops: strawberry, raspberry

- Pests and or weeds addressed in the demonstration: D. Suzukii fly and how it can spread in Finland. One or two has been found in a liquid trap so far.
- IPM strategy and tools demonstrated: Monitoring of D. Suzukii fly, based on on-going experiment in Eastern Finland in the soft-fruit sector in Natural Resources Institute Finland.
- Goal and short description of the demonstration:
  Berry farmers christmas seminar. IPM on soft fruit farms and especially D. Suzukii fly spreading in Finland. Only some insects have been identified in Finland. Networking between farmers located in different areas. Further issues discussed are the consequences of CAP27 for a horticultural farm and demands from future food markets.

Belgium, Inagro

Time: 20 April 2023

- Topic of the demonstration: Variety selection
- Number of visitors: 4
- Crops: Zucchini
- Pests: Mildew
- IPM strategy and tools: Prevention through variety choice and biocontrol agents for disease control.
- Goal and short description of the demonstration:
  The demonstration based on the comparison of Zucchini cultivars went quite well as the group dynamic was good. A small group has the advantage of possible intense interactions. The IPM measures shown were on the preventive side of cultivars with limited sensitivity to diseases, but the holistic vision of the cropping system was also discussed. The use of biocontrol agents was also demonstrated.

Time: 31 May 2023

- Topic of the demonstration: Variety selection and production, use of bio-foil
- Number of visitors: 21
- Crops: Zucchini
- Pests: Mildew
- IPM strategy and tools: Cultivars
- Goal and short description of the demonstration:
  The demonstration aspect on field was somewhat limited because the planting was just done and no differences could yet be seen very well among cultivars. Some heat stress with the visitors could be avoided, but nevertheless it was a hot day. We discussed

pollination as essential for good fruit setting. As the hub members were very interested in biodegradable foils, we involved a farmer for an onsite demonstration.

Time: 18 July 2023

- Topic of the demonstration: Mildew control
- Number of visitors: 13
- Crops: Zucchini
- Pests: Mildew
- IPM strategy and tools: Disease prevention through variety choice and the use of biostimulants
- Goal and short description of the demonstration:
  Mid July is the full-peak of harvest for most outside zucchini growers. We therefore had less visitors than expected. The farm walk in which the farmers had to score the cultivars in small groups was received enthusiastically. As IPM measures against powdery mildew we discussed different options on biopesticides and new pesticides. Catering was good and people appreciated this.

Portugal, Consulai

Time: March 2023

- Topic of the demonstration: soil management as preventive measure
- Number of visitors: 15
- Crops: all crops in the rotation
- Pests: pests in general
- IPM strategy and tools: prevention through crop rotation, cover crops & beneficial micro-organisms
- Goal and short description of the demonstration:
  The goal was to raise the awareness of attendees, about preventive measures to reduce pest pressure, such as crop rotation, cover crops, minimum soil mobilization and other practices to improve soil structure. Demonstration of results of using different cover crops inoculated with beneficial microorganisms in the soil microbiome.

Time: July 2023

- Topic of the demonstration: organic cultural practices adapted for conventional farming
- Number of visitors: 12
- Crops: all crops in the rotation

- Pests: weeds and pests
- IPM strategy and tools: inclusion organic cultural practices
- Goal and short description of the demonstration:
  The objective was to let conventional farmers get inspired by pest management in organic farms, and demonstrate biological and cultural practices in an organic farm that can be integrated in a "conventional" farm. Main practices: Crop rotation, false seedbed, biocontrol, as well as combination of other practices.

Time: July 2023

- Topic of the demonstration: Use of healthy starting/planting material
- Number of visitors: 12
- Crops: Sweet potato
- Pests: all pests that can be transferred by planting material
- IPM strategy and tools: start with healthy plants
- Goal and short description of the demonstration:
  A farm walk, demonstrating the selection of good starting material is crucial for disease prevention, and other good practices on sweet potato production. Selection of healthy material (healthy seedlings from micropropagation) to reduce disease pressure, and pest monitoring (with chromotopic traps) to reduce unnecessary treatments.

Time: October 2023

- Topic of the demonstration: organic soil management practices to reduce the use of pesticides
- Number of visitors: 13
- Crops: all crops in the rotation
- Pests: all weeds and relevant pests
- IPM strategy and tools: sustainable soil management
- Goal and short description of the demonstration:
  A farm walk to demonstrate and discuss organic practices of soil management to reduce the use of pesticides. Catch crops, cover crops, crop rotation, minimum soil mobilization, use of animals for weed control, and other practices.

Serbia, Biosense

Date: 27 May 2023

- Topic of the demonstration: Optimal measures for cover crop cultivation in vegetable crops
- Number of visitors:10
- Crops: potato crops
- Pests and or weeds addressed in the demonstration: This demonstration was focused on fertilization, natural fertilization using the commercial mix of cover crops – fava, alfalfa, oilseed radishes, phacelia.
- IPM strategy and tools demonstrated: soil health as prevention for diseases
- Goal and short description of the demonstration:
  We had a presentation of how cover crops function in the vegetable sector. Our Hub Coach presented the optimal amount of mixture, when is the optimal time to sow, the optimal time for cover crop termination. Also, the participants discussed how cover crops could benefit vegetable crop production, in particular the potato crop, and how it is useful for sandy soils, which was the structure of the soil on the locality of the demo event.

Date: 19 September 2023

- Topic of the demonstration: Soil health, and tools for assessing soil health
- Number of visitors: 20
- Crops: Potato crops
- Pests and or weeds addressed in the demonstration: Soil health and quality
- IPM strategy and tools demonstrated: Using tools such as penetrometer, counting worms in the soil, tea bag-test (degradation rate in the soil, telling something about soil life activity)
- Goal and short description of the demonstration:
  From using penetrometers to assess soil compaction, to conducting worm counts for soil biodiversity, and even demonstrating the degradation of tea bags or fabric as indicators of soil microbial activity, attendees gained valuable insights into enhancing soil health. Our aim was to equip farmers with actionable knowledge and tools to promote sustainable practices and maximize potato crop yields.

Date: 19 October 2023

- Topic of the demonstration: Bio-stimulants as plant protection agents in the production of bell peppers
- Number of visitors:19
- Crops: Bell pepper
- Pests and or weeds addressed in the demonstration: *Xanthomonas campestris* pv. *vesicatoria*
- IPM strategy and tools demonstrated: bio-stimulants to increase the immune response of crops to bacterial disease
- Goal and short description of the demonstration:
  Presentation of real-world examples of bio-stimulant applications in bell pepper cultivation but also sharing results from scientific studies demonstrating the efficacy of bio-stimulants in pest and disease management. The participants had an opportunity to see the results on a farm in Tavankut, Serbia.

Date: 27 October 2023

- Topic of the demonstration: Benefits of natural predators and parasites.
- Number of visitors: 10.
- Crops: Maize
- Pests and or weeds addressed in the demonstration: European corn borer
- IPM strategy and tools demonstrated: Using the parasitic wasps against *Ostrinia nubilalis*
- Goal and short description of the demonstration:
  Applying *Trichogramma* as a biological control agent against *Ostrinia nubilalis*, the European corn borer, in corn crops, can be an effective strategy to reduce pest populations and minimize crop damage. *Trichogramma* were released in the form of parasitized eggs contained within dispensers. These dispensers are hung or placed strategically throughout the corn field, ensuring even distribution of *Trichogramma.*

Date: 13 November 2023.

- Topic of the demonstration: Plant protection conference.
- Number of visitors: 60.
- Crops: various
- Pests and or weeds addressed in the demonstration: various

- IPM strategy and tools demonstrated: different microbiological products used for plant protection against pathogen and insects.
- Goal and short description of the demonstration:
  The microbiological products showcased during the event encompassed a range of beneficial microorganisms utilized in Integrated Pest Management (IPM) strategies for crop protection. Some examples of microbiological products highlighted at the conference: Biopesticides – Beauveria spp., Metarhizium spp., Bio-fungicides-Bacillus spp., etc.

Vineyards

Portugal, Consulai

Date: 11 January 2023

- Topic of the demonstration: DSS for IPM in vineyards
- Number of visitors: 14
- Crops: vineyards
- Pests: mildew, powdery mildew, green leafhopper, grape moth
- IPM strategy and tools: monitoring and decision making through the use of DSS for pest control
- Goal and short description of the demonstration:
  The use of DSS can support decisions based on data that was transformed to relevant information, allowing to optimize decision making and avoid unnecessary treatments. The available solutions for mildew, powdery mildew, green leafhopper, grape moth for IPM were demonstrated. At the end of the demonstration event, Mentimeter was used so the attendees could share more easily opinions and ideas.

Date: 4 April 2023

- Topic of the demonstration: control of green leafhopper
- Number of visitors: 16
- Crops: vineyards
- Pests: leafhopper
- IPM strategy and tools: water and nutrient management, prevention measures (pruning), and Decision Support Systems
- Goal and short description of the demonstration:
  Demonstration of cultural practices (canopy management, pruning, irrigation) and a Decision Support System to decide if and when to spray.

Date: 20 March 2023

- Topic of the demonstration: crop nutrition in relation to pest management
- Number of visitors: 14
- Crops: vineyards
- Pests: green leafhopper and mites
- IPM strategy and tools: adapted nutrient management
- Goal and short description of the demonstration:
  Demonstration of the control of the green leafhopper and mites, prevention by managing the nutritional status of the plants.

Date: 6 December 2023

- Topic of the demonstration: sustainable strategies for cover crop management
- Number of visitors: 11
- Crops: vineyards
- Pests: prevention for several pests
- IPM strategy and tools: strategic cover crop management, soil tillage, grazing
- Goal and short description of the demonstration:
  Demonstration of the techniques applied over the years in the vineyard and their results, followed by a discussion among the participants. Techniques applied are mechanical practices and the use of sheep flocks to control weeds

Spain, FEUGA

Date: 14 February 2023

- Topic of the demonstration: Pruning techniques and its link with IPM
- Number of visitors: 35
- Crops: vineyards
- Pests: effects of pruning on diseases
- IPM strategy and tools: Pruning techniques, soil management, trunk diseases prevention
- Goal and short description of the demonstration:
  Pruning decisions impact the volume and quality of grapes at harvest, and also present an opportunity to control disease pressure and address vine damage. The demo event showcased different (traditional & modern) pruning techniques and their impact on the

vineyards (reduction of diseases, soil management), that were discussed with the attendees.

Date: 21 July 2023

- Topic of the demonstration: Minimizing spray losses, applying precise amounts according to previously collected data, such as canopy size, weather, and phenology.
- Number of visitors: 70
- Crops: vineyards
- Pests: weeds, fungal diseases
- IPM strategy and tools: 1. mechanical defoliation techniques to prevent fungal diseases such as botrytis; 2. confined spaying system to reduce the drift of required treatments; 3. mechanical weed control strategies to avoid herbicides use
- Goal and short description of the demonstration:
  Demonstration of mechanical weed control, LIPCO spraying system & Leaf removal of the vine mechanical techniques. Advantages of mechanical weed control explained: - herbicides reduction, loosening soil and promoting plant growth. Advantages of the confined spraying system explained to the farmers: 35-40% less plant protection products over the season, up to 99% less drift. The demonstrated equipment saves time as several rows can be treated simultaneously. Moreover, the operator is protected from drift.

Date: 27 July 2023

- Topic of the demonstration: Vineyard canopies and biodiversity in vineyards
- Number of visitors: 25
- Crops: vineyards
- Pests: mildew, powdery mildew, green leafhopper, grape moth
- IPM strategy and tools: monitoring and decision making through the use of DSS for pest control
- Goal and short description of the demonstration:
  The use of DSS can support decisions based on data that was transformed to relevant information, to avoid unnecessary treatments. The available solutions for mildew, powdery mildew, green leafhopper, grape moth for IPM were demonstrated.

Greece, UA

Date: 15 March 2023

- Topic of the demonstration: Weed suppression by cover crops

- Number of visitors: 30-40
- Crops: Cover crops
- Pests: Weeds: *Conyza canadensis, Cynodon dactylon, Convolvulus arvensis*
- IPM strategy and tools: Prevention for weed development and weed seeds production
- Goal and short description of the demonstration:
  Demonstrate the weed suppression by cover crops in an in-field comparison. Live demonstration of seeding. Results are published in the report about in-field comparisons.

Date: 22 April 2023

- Topic of the demonstration: Results of weed suppression by cover crops (follow up meeting)
- Number of visitors: 30-40
- Crops: Cover crops
- Pests: Weeds: *Conyza canadensis, Cynodon dactylon, Convolvulus arvensis*
- IPM strategy and tools: Prevention for weed development and weed seeds production
- Goal and short description of the demonstration:
  Demonstration of the impact of the fully grown cover crops to reduce the growth of weeds.

Date: 11 May 2023 (first location, Kiato)

- Topic of the demonstration: Non-chemical weed control
- Number of visitors: 30-40
- Crops: vineyards
- Pests: weeds, mainly the problematic weeds *Conyza canadensis, Cynodon dactylon, Convolvulus arvensis*
- IPM strategy and tools: alternative for chemical weed control.
- Goal and short description of the demonstration:
  Demonstration of the foam stream, an alternative weeding method in which hot foam is applied on the following weeds: *Conyza canadensis, Cynodon dactylon, Convolvulus arvensis.* The hot foam is a combination of natural plant oils and sugars making it safe to be used around people, animals and crops. It is ecofriendly and easy to use.

Date: 11 May 2023, second location (Nemea)

- Topic of the demonstration: Non-chemical weed control

- Number of visitors: 30-40
- Crops: vineyards
- Pests: weeds, mainly the problematic weeds *Conyza canadensis, Cynodon dactylon, Convolvulus arvensis*
- IPM strategy and tools: alternative for chemical weed control.
- Goal and short description of the demonstration:
  Demonstration of the foam stream, an alternative weeding method in which hot foam is applied on the following weeds: *Conyza canadensis, Cynodon dactylon, Convolvulus arvensis*. The hot foam is a combination of natural plant oils and sugars making it safe to be used around people, animals and crops. It is ecofriendly and easy to use.

Date: 27 July 2023

- Topic of the demonstration: Spraying drones
- Number of visitors: 30-40
- Crops: Vineyards
- Pests: Weeds and pests
- IPM strategy and tools: Precision/site specific spraying
- Goal and short description of the demonstration:
  During this demo event, the farmers got the chance to see a spraying drone in action. Although currently prohibited according to the European legislation (considered as 'aerial spraying', as defined in Directive 2009/128/CE), spraying drones could be used for precision spraying and considerable reduction of the amount of applied product, as soon as the legislation is changed on this topic. For the spaying application we used a mix of tartazine and water, totally safe for both the participants and the environment. We also compared the spraying drift of the drone with the drift of conventional sprayers.

Slovenia, KGZS MB

Date: 8 September 2023

- Topic of the demonstration: Biological control
- Number of visitors: 50
- Crops: Vineyards
- Pests: European grapevine moth (*Lobesia botrana*) and the European grape berry moth (*Eupoecilia ambiguela*)
- IPM strategy and tools: Mating disruption, using pheromone traps

- Goal and short description of the demonstration:
  The goal was to demonstrate the control of insect pests by pheromones (ISONET L PLUS dispensers). The population of grape moths was monitored during the growing season. At the demonstration event, the % of damaged bunches of grapes was 0.4 %, what is under threshold level of 5 %. The method proved to be effective, and can save 2-3 insecticide applications.

4. Evaluation & conclusion

All the partners of the IPMWORKS project were asked to share details on their demonstration events executed in 2023, and this report gives a summary of all the demonstration events conducted. Demonstration events have been conducted in all crops & sectors, represented in IPMWORKS. Different topics are addressed in the demonstrations, such as biological control, resilience of cropping systems, weed management or pest management.

For the continuation of the project, each hub can be inspired by the past experiences of earlier demonstrations conducted in the project, as results are shared and discussed in the annual project meeting.

Based on the feedback of Hub Coaches who organized the demo events, and on exit polls collecting feedback from the attendees at each event, the demonstrations have been evaluated considering aspects such as the preparation, the execution and the success of the events. The results of the evaluation are reported in the milestone report. The main messages of this milestone report are summarised here:

The monitoring and evaluation of these demonstration activities helps us to measure to what degree the project has reached these objectives, and gives input to the further improvements of future demonstration activities. Monitoring and evaluation takes place through exit polls in IPMWORKS, which are then collated into exit poll aggregation forms within the hub journals. These exit polls contain questions that give insight into topics such as (i) the goal of the demonstration; (ii) the targeted audience; (iii) the methods used; (iv) what the farmers learnt; and (v) what the farmers could apply to their farms. For this milestone, LEAF collated the data from each hubs hub journals and then looked for trends and insights from key questions.

Between September 2023 and January 2024, LEAF began by analysing exit poll data (Task 3.4) from 12 of the project's 22 hubs and 40 demo events, as this was the only data available during this period. 1767 visitors attended these demo events, with 30% of these (537 people) having filled in exit polls.

In October 2023, it was decided that the monitoring and evaluation report (Task 3.4) would be pushed back to January 2024 due to not enough hubs having added their exit poll data into the hub journal. This decision was made in order to maximise the amount of data which could be

collected and analysed. In addition, a number of interviews were conducted with hub coaches to collect data on demonstration events which did not have associated exit poll data.

Between the 14th to 16th of November, LEAF attended the IPMWORKS annual meeting in Almeria and the work package co-lead presented the initial findings from the analysis of the exit poll data. The meeting also provided an opportunity to remind hub coaches to update the hub journals with their exit poll data from demonstration events.

In January 2024, LEAF produced a monitoring and evaluation report which outlined the exit poll data results from IPM demonstration activities at events. Each chapter begins with an overview of each question asked in exit polls and how it relates to the project's objectives. The chapters then outline the data results, followed by a discussion of the key findings, insights and significant conclusions.

The events demonstrating IPM strategies tested or implemented in IPMWORKS farms contributed to enhance the knowledge of visiting farmers about the technical and economic effectiveness of the demonstrated strategies. They contributed to the motivation of farmers to apply these strategies on their own farms.