Educational material for social skills in IPM demo hubs

Deliverable D1.4

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

Coordination and Support Action (CSA)

01 October 2020 – 31 March 2025 (54 months)

Deliverable D1.4

Educational material for social skills in IPM demo hubs

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☐	**CO**	Confidential, only for members of the consortium (including the Commission Services)

Abstract

This deliverable details an approach to integrated pest management proposed by the IPMWORKS project. It focuses on the utilization of demonstration hubs as a core strategy for the widespread application of Integrated Pest Management (IPM) practices, more specifically the holistic approach to IPM that IPMWORKS proposes.

The essential message of this report is that social skills (of advisors/hub coaches, but not only of them) are of critical importance in such demonstration hubs and the report illustrates in a variety of ways what this means. This is very relevant for farmer demonstration hubs/networks in general as well as those focusing specifically on IPM because the tendency is to focus on content expertise, paying less attention to the critical role of social interaction processes, including peer-to-peer learning and exchange.

The report outlines a series of methods, processes, and tools specifically designed to foster interactive processes among farmers, thereby improving conditions that support farmers in their decision to implement IPM practices. The IPMWORKS approach centres on interactive facilitation as a critical component in demonstration hubs, employing specialized tools and methods to actively engage participants. These facilitation processes are designed to stimulate direct involvement, encourage the exchange of ideas, and enhance practical understanding of IPM strategies within farming communities. The approach includes:

- Utilization of specific facilitation strategies that are tailored to encourage active participation and collaborative learning.
- Implementation of interactive tools that support the facilitation process by enabling participants to explore IPM concepts and practices in a hands-on manner.
- An emphasis on a process-oriented approach that focuses on the journey of learning and adaptation rather than solely on outcomes (notably actual implementation of IPM practices and reduction in pesticide use), fostering a deeper understanding and commitment to IPM practices.

The demonstration hub approach pioneered by IPMWORKS integrates hands-on learning experiences with peer-to-peer knowledge exchange. These hubs serve as dynamic platforms where farmers, advisors, and other agricultural stakeholders can directly observe and learn about effective IPM practices in real-world settings. The approach emphasizes:

- Real-World Application: Demonstrating practical, scalable, and economically viable IPM options in situ to show tangible benefits.
- Community Engagement: Building strong networks within the agricultural community to foster support and continuous knowledge sharing.
- Innovative guidance: Incorporating comprehensive support that covers both technical pest management tactics and essential social skills such as leadership and communication.

Key Messages from the Report

- Empowering farmers through active participation leads to higher engagement and subsequent choices to apply holistic IPM.

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- The report highlights the significant impact of hands-on, practical experiences over traditional theoretical training methods.
- Sustained success in farmers choosing to apply (holistic) IPM is strongly tied to the strength and engagement of the community formed around each hub.
- Effective facilitators are crucial for guiding learning and discussions within hubs, directly influencing the practical uptake of IPM methods.
- The tailored facilitation methods are shown to be effective in addressing the specific needs and challenges of the agricultural community, thereby improving the uptake of sustainable practices.

The demonstration hub approach as conceptualized by IPMWORKS represents a transformative step in sustainable agriculture, combining effective IPM practices with robust community engagement and adaptive learning frameworks. This approach therefore not only facilitates the reduction of pesticide use but also enhances the sustainability and economic viability of European agriculture. The facilitation approach described in this report is a cornerstone of the IPMWORKS strategy towards wider application of (holistic) IPM through demonstration hubs.

By implementing the facilitation approach as presented in this report, including paying close attention to the associated need for social skills, the project aims to establish a more dynamic, engaged, and effective learning environment for farmers, ultimately leading to broader application of this example and more resilient, sustainable farming practices across Europe.

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1. Introduction

This deliverable provides a selection of educational material related to the social skills required for facilitating IPM demo hubs, without repeating what was already published in other project materials. It builds on the work of various work packages of IPMWORKS, such as insights from the IPMWORKS demonstration hubs, insights shared by their hub coaches through WP2 and WP3 activities, and other deliverables produced in WP1 (D1.1, D1.2, and D1.3). Further, also insights from other IPMWORKS outputs have been used, such as (internal) newsletters, the hub journal information on the demonstrations done by the IPMWORKS hubs, as well as the contents for Module 8 of the IPMWORKS e-learning programme (available on https://ipmworks.net/toolbox/en/#/e_training). In other words, in putting together a selection of educational material for social skills for IPM demo hubs, we have benefitted from a wide variety of work streams of IPMWORKS. This deliverable may thus be considered a synthesis of all related materials in relation to the topic of social skills. To prevent doubling up on what other IPMWORKS deliverables and other products already do, we will often present some of the essence of what is presented there, and refer to those other produces for more detail. Readers can decide which of those resources would be particularly useful to consult.

1.1. Purpose and focus of this deliverable

This deliverable connects to the specific context of (holistic) IPM. However, the focus here will not be on all the details of IPM options and applications, but on related learning and decision making processes of farmers in a demo hub supported by a hub coach, and specifically on how such interactive processes can be guided and facilitated by a hub coach.

The idea of demonstration hubs (demo hubs in short) is not new and not unique. Many projects have made demo hubs a core part of their efforts, notably in recent years the EU H2020 NEFERTITI project. These projects identified the critical need for addressing the social/cultural side of demo hubs if they are to be successful. The social side is about the fact that hub interactions are not just about technical issues, but also very much about social interactions between hub members who have different backgrounds, personalities, and preferences. The cultural side relates to specific cultural preferences which are different for different parts of Europe regarding what makes such interactions appropriate (in the cultural sense).

For a long time, the focus of agricultural demonstrations (and in some cases even farmer field schools) has been on showing, explain and answering questions on the technical, agronomic, and ecological dimensions of a particular demonstration. This approach has also been framed as 'transfer of technology', 'transfer of knowledge', and 'extension'. This top-down approach did not pay sufficient attention to the fact that:

1) Farmers are experts in their own right just as much as researchers and advisors are,
2) Teaching is for adults (i.c. farmers) often not the most effective way to bring about learning (outcomes),
3) It is one thing to be shown and explained things, but quite another to consider implications of applying what was learnt in one's own context (i.c. farm), and

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4) Being in a learning process together as farmers and advisors (being partners/peers in learning) for a longer time period enriches learning processes and creates more opportunities for farmers to apply new farming/cropping practices.

This is where the word 'facilitation' comes in. Social skills in the context of demo hubs are about making learning and related interactions easier and more relevant. It takes the social-interaction side of demo hubs seriously, acknowledging that farmers are adults who have specific preferred learning styles other than being taught. We are social beings and unless the social side of a demo hub works out well, the learning about techniques, etc. will not work out well. It is about creating learning communities rather than teaching audiences.

Farmer demo hubs on (holistic) IPM are platforms where farmers can demonstrate and observe agricultural practices in a real-world setting. This is not simply about observing and then knowing what to do. It is greatly enhanced if accompanied by discussing this with others, exchanging views, bringing in additional information, etc. In this way, farmers can interactively make sense of what they see and hear, which is motivating for engaging in such a learning process. The success of demo hubs therefore depends on the extent to which group dynamics among participating farmers and other stakeholders supports such learning process.

IPMWORKS has built on insights from earlier projects that also included a focus on social skills and group facilitation processes, and has applied this in the specific context of Integrated Pest Management (IPM). In doing so, we have refined and adapted certain methods and approaches, as well as worked on tweaking the demo hubs approach to the specific content and context of IPM-related collaborative efforts. Also, as part of the wider efforts of IPMWORKS, the "holistic IPM approach" was chosen as a way to stress the importance of focusing on a whole farm approach, rather than the adoption of a single practice, making IPM contribute to an effective and economically viable integrated crop management and the reduction of pesticide use. Furthermore, the active network of 22 demo hubs across Europe added to the ability to learn in a cross-comparative way about making IPM work for sustainable farming. These various specific dimensions of the work of IPMWORKS have resulted in what we may consider to be the IPMWORKS demo hub approach.

Here, we therefore focus on presenting both the IPMWORKS demo hub approach and how a variety of social skills (notably for hub coaches) can help this approach to flourish under different circumstances (in terms of geography, climate, soils, culture, policy, markets, crop, and agricultural sector). We illustrate a variety of ways (from wider approach to specific methods) to apply social skills and facilitating interactive learning in the context of IPM demonstration networks (Figure 1).

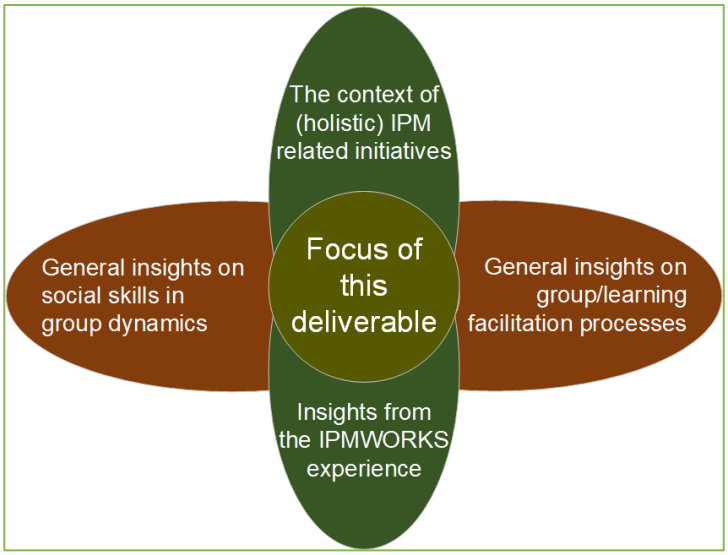

Fig.1. Focus and limitation of what this deliverable is about

This deliverable is meant to benefit both policy makers and managers/designers of IPM-related programmes across Europe, and current and future hub coaches (advisors). For this reason, this report contains both descriptions of strategic considerations, as well as practical explanations about methods to help enhance social interactions. This means that we

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consider educational material to relate to both what policy makers and managers/designers of IPM-related programmes need to understand about social skills in IPM demo hubs so that they can create enabling conditions, and to the practical guidance that is specifically useful for hub coaches.

1.2. The IPM challenge, IPMWORKS and the farmer demo hub approach

At the heart of the H2020 IPMWORKS project lies an innovative approach designed to propel the implementation of Integrated Pest Management (IPM) across Europe: the IPMWORKS demonstration hubs. These hubs consist of 10-15 farmers located in the same area and working in a similar sector, interested in lowering their pesticide use, in experimenting with the possibilities that IPM offers for reducing and controlling pests and diseases, and in sharing their experiences with peers. Most hubs have around 4-8 meetings per year, participating farmers (at least some of them) test IPM practices, together they organise demo events, many participate in (international) cross-visits (both going to other places as well as hosting visits), sometimes visits to e.g. a factory, and social activities such as a BBQ are part of meetings/events. The hubs serve as a linchpin for interactive, hands-on learning and peer-to-peer exchange, underpinning the project's mission to reduce pesticide use while enhancing agricultural sustainability and profitability.

The IPMWORKS demo hubs are grounded in the recognition that real change in pest management practices requires more than just access to new information; it necessitates a comprehensive, experiential learning process where farmers can see, firsthand, the practical application and benefits of holistic IPM strategies. By fostering environments where farmers can share successes, challenges, and insights gained from their own experiences, these hubs are catalysing a paradigm shift towards reduced pesticide reliance.

Drawing inspiration from a range of successful precedents in Europe, like the French DEPHY network, the IPMWORKS project builds and extends upon past and existing farm demonstration networks. These networks not only showcase the viability and effectiveness of IPM strategies but also actively engage farmers, advisors, and other stakeholders in a collective learning journey. The establishment of these hubs in areas lacking formal organization of IPM pioneers facilitates the spread of knowledge and best practices, creating a ripple effect that extends beyond the immediate participants to the broader agricultural community.

Insights from farmer demo hubs are also translated to informing policy-making, notably also at EU level. A pivotal moment for the IPMWORKS project was the organization of an exhibition at the European Parliament, demonstrating the tangible impacts of IPM on pest control. This event underscored the importance of demonstration activities in fostering understanding and support among policymakers for the transition towards more sustainable pest management practices. It highlighted the project's commitment to supporting farmers through this transition, advocating for enhanced support mechanisms that can sustain a movement towards wider application and success of IPM strategies.

The comprehensive collaboration within the IPMWORKS project, involving 31 partners from 16 European countries, showcases the power of collective action in addressing complex challenges. By leveraging the diverse experiences and knowledge within this network, the demo hubs are equipped to showcase a wide range of IPM strategies, tailored to different agricultural contexts and needs. This diversity is crucial for illustrating the adaptability and effectiveness of IPM across Europe's varied agricultural landscapes.

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Ultimately, the IPMWORKS demo hubs embody an approach that goes beyond traditional dissemination methods. By engaging farmers and other stakeholders in active, peer-to-peer learning environments, they illuminate the path towards a more sustainable and resilient agricultural future. This innovative model not only demonstrates the practicalities of implementing IPM strategies but also builds a supportive community of practitioners committed to reducing pesticide use and enhancing farm profitability and environmental sustainability.

1.3. What informed this deliverable

This deliverable is informed by a range of IPMWORKS outputs . Basically anything that relates to social interactions in those products has been brought together to inform this deliverable. This means we have not just looked for the obvious set of methods that we could share, but also took insights from informal exchanges, such as the hub coaches' WhatsApp group. This enabled to create an integrated perspective on social skills in IPM demo hubs. The following key sources informed this deliverable:

- Written materials from the EU H2020 NEFERTITI on farm demos, such as guidelines for conclusion at a demo event, and the design guide for on farm demonstrations, and deliverables on monitoring processes and products (D5.1 and D5.3).
- Written materials from EU H2020 IWMPRAISE, especially on serious gaming.
- Formal literature, such as on competencies for agricultural advisors in innovation support, on how farmers learn, on success factors of on-farm demo events, and on such topics as principles of adult learning (Adamsone-Fiscovica et al. 2021; Deguine et al. 2021; Ensor and de Bruin, 2022; Franz et al. 2009; Kroma, 2006; Lybaert et al. 2022; Rossi et al. 2023)
- Reports from facilitated sessions during IPMWORKS meetings, such as the Toulouse capacity building workshop, and sessions on holistic IPM conversations.
- Presentations on social skills related topics for Module 8 of the IPMWORKS e-learning programme.
- Intermediate products of IPMWORKS that were not shared before, such as guidance on facilitating interactive processes in hubs.
- IPMWORKS guidance on the facilitation of hub self-assessment processes, as well as formal reports on the analysis of hubs' self-assessments (notably Deliverable D1.3).
- IPMWORKS deliverables related to demonstration events, notably Deliverables D3.1, D3.3 and D3.4.
- Other IPMWORKS deliverables of WP1 on good practices in demo hubs: Deliverable D1.1 and D1.2.
- IPMWORKS deliverables on agreed common methods (D2.2).
- IPMWORKS (internal) newsletters and IPMWORKS hub journals of the different demo hubs.

In terms of writing process, a first draft was written by the first author and then discussed with the Task 1.4 team to fine-tune contents.

1.4. Navigating this deliverable

The logic of this deliverable is illustrated in Figure 2. In **chapter two** we present and then explain the building blocks of the wider IPMWORKS approach of which the demo hub approach is part. Chapter three elaborates on related key performance areas as part of what creates an enabling environment for learning on IPM in the demo hubs. **Chapter four** discusses general features of what social skills are then needed for managing and facilitating IPM demo hubs. In **chapter five** we expand on the idea of "facilitation" in

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farm demo hubs, making learning and making decisions. We expand on essential approaches in the main text with ample references to practical options that are placed in the Annex 1-3. So this is the core chapter providing practical options for facilitation. After this, in **chapter six**, we close with a brief discussion with conclusions on social skills in IPM demo hubs and how this involves individual competencies and organizational capacities. At the end of each chapter, we list a number of sources for further reading.

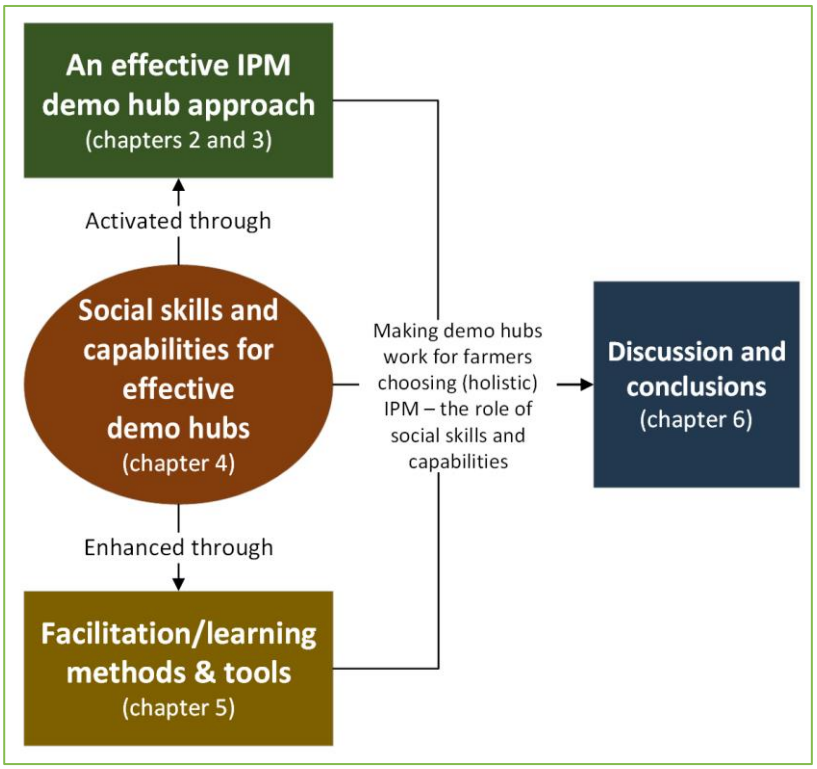

Fig. 2. Summary outline of this deliverable report

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2. Towards effective IPM demo hubs – building blocks of a comprehensive approach

The IPMWORKS demo hubs are based on a comprehensive and coherent approach to the way in which social interactions and related social skills feature in those groups. This represents a variety of angles on the topic. In this short chapter, we explain related building blocks that are part of this approach. Though not the focus of this deliverable, we include a brief description of the IPMWORKS perspective on "holistic IPM" since this provides a view on the fact that IPM content (the holistic IPM perspective) and IPM process (the social interactions in demo hubs) need to come together in concrete facilitation of demo hubs.

2.1. Holistic IPM in brief

The IPMWORKS holistic IPM approach connects to similar points as raised by Barrera (2020) in his book on Holistic Pest Management. The holistic IPM approach translates into the five pillars below (also see Figure 3) and directly aligns with the purpose of contributing to a decrease in reliance on pesticides:

Pillar 1: Agricultural landscapes with diverse semi-natural habitats designed to manage pests, weeds and diseases, e.g. through spatial diversity in terms of landscape features such as hedgerows, grass and flower strips and other semi-natural habitats favouring beneficial biodiversity.

Pillar 2: Cropping systems designed to manage pests, weeds and diseases, e.g. through diversified crop rotations, cultivars resistant to diseases, intercropping, sowing dates adapted to escape pests, moderate fertilization, crop mixtures, and other practices.

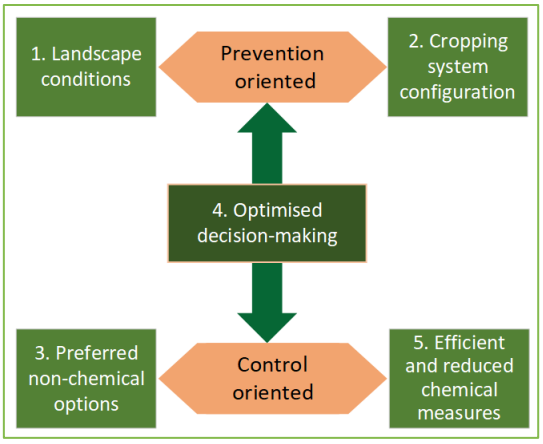

Fig. 3. Summary presentation of the holistic IPM approach

Pillar 3: Preferential use of non-chemical control options, e.g., mechanical weeding (and eventually robotics), release of biocontrol organisms and agents, mating disruption, protective nets, and other non-chemical methods.

Pillar 4: Optimized decision making guiding operational and strategic IPM choices, e.g. precise monitoring and IPM Decision Support Systems (DSS) to avoid unnecessary treatments, and periodic evaluation of IPM strategies to continually fine-tune and improve context-specific approaches.

Pillar 5: Increased efficiency of treatments, e.g. through technologies for precision and patch spraying, including anti-resistance strategies.

This translates into a vision for the future of pest management[1] in Europe in which agricultural landscapes and cropping systems are effectively designed to manage pests, diseases and weeds, decision making is

[1] In this context, 'pest management' is understood as including pest, diseases and weed management

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optimised on all farms to ensure effective pest management and avoid unnecessary treatments, non-chemical pest control options are preferred by all, efficiency of treatments of pesticides is optimised, and crop production is economically profitable.

The implementation of holistic IPM at a large scale will moreover delay the development of resistance of pest, disease and weed biotypes to pesticides. Implementation of holistic IPM implies a redesign of current cropping systems to adopting a diversified management strategy including a broad range of preventive and curative tactics.

2.2. IPMWORKS demo hub approach – key performance areas

Based on the experience of IPMWORKS hubs, we identified six key performance areas that together determine much of how a hub will function and how effective it can be for interactive learning on a farm and context specific IPM. We will discuss these further in the following chapter.

1. An **appropriate organizational setup**. These are the preconditions for starting up demo hubs.
2. **Activating** the **pillars** of **holistic IPM** in learning.
3. Hub coaches/advisors and specialists supporting them **acting as facilitators and being co-learners together with farmers**. This means that hub coaches recognize farmers as equals in the learning process .
4. **Engaging farmers meaningfully**. Their time is precious and they are not meant to be passive listeners, but active participants in the demo hub.
5. **Creating opportunities for interactive learning**, not assuming that this takes place automatically when farmers meet.
6. **Methods and tools** that can enhance the learning experience, and the hub experience in general.
7. **Navigating social dynamics**. This is about relationships, community and the ability to deal with related challenges and opportunities.

We will discuss these seven performance orientations in more detail in chapter three.

2.3. An integrated perspective on the IPMWORKS approach

Figure 4 presents the integrated IPMWORKS demo hub approach as a combination of the holistic IPM pillars and the key performance areas of demo hubs. This means presenting a combination of IPM contents (the pillars) and related learning processes. That is precisely what is meant to be the strength of the IPMWORKS demo hub approach: an effective interaction between content and process.

During the 2023 IPMWORKS annual meeting in Almería, Spain, hub coaches discussed ways of tuning facilitation processes and methods to the specific topics and questions as relevant for each of the five pillars of holistic IPM. This provided a series of ideas and experiences that clearly indicated the relevance of bringing together this content focus and the process needs of IPM-related demo hubs.

The framework also serves as a reminder of the multifaceted nature of demo hubs, both in terms of the 5 pillars of holistic IPM, in terms of the social processes and conditions taking place in hubs, and in terms of how those two interact.

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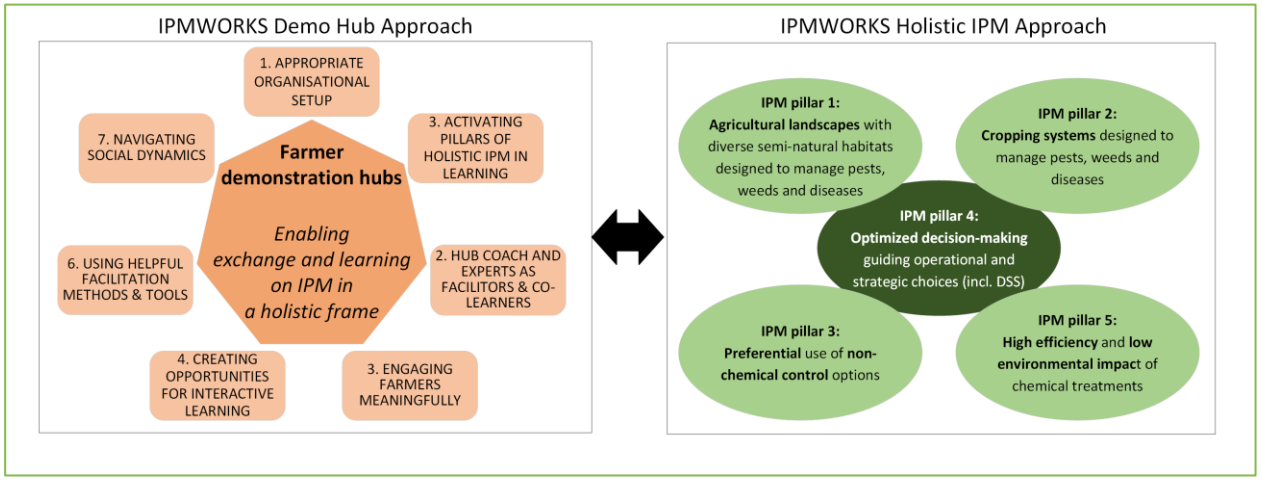

Fig. 4. The IPMWORKS approach in brief

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3. Key performance areas of the IPMWORKS demo hub approach

In this chapter we describe what the key performance areas of the IPMWORKS demo hub approach are about. Some of the subjects described in this chapter require further elaboration which we do in chapters five and six. We close with a simple checklist that may help to get an idea about your and/or your organisation/initiative's readiness for setting up effective IPM demo hubs (in 2.2.8).

3.1. The overall organisational setup

There are a number of conditions related to the organisational setup of demo hubs that IPMWORKS applies and has good experiences with. Besides working from a holistic IPM perspective, it involves:

- Bringing together a group of 10 -15 farmers who voluntarily decide to be part of this hub for some years;
- Having a hub coach who will guide and facilitate processes (incl. planning and organisation) in the farmer group;
- Farmers experimenting with IPM practices on their farms;
- Organising farm visits;
- Organising demo events to reach a wider farming audience than the farms actively involved in the hubs;
- Organising region-specific and sector-specific hub activities (i.e. activities that are relevant and appropriate for that particular region and the particular sector which participating farmers are part of);
- Exchanges between hubs across countries in Europe (cross-visits).
- Joint planning of activities and annual participatory evaluation regarding how the hub and its activities have functioned.

This already shapes much of the context in which hub activities take place as well as the facilitation context. Besides those shared characteristics of IPMWORKS demo hubs, each initiator of the demo hub (i.e. the IPMWORKS partner organisations) further determines how continuity, governance, financing, and institutional backup is organized (also see Box 1).

- Demo hub **continuity** relates especially to the continuity of hub coaches though it may sometimes also be about farmers leaving the hub. If hub coaches change regularly, this may undermine group dynamics as well as continuity of the collective learning process. Also, the momentum of hubs may be lost if activities take place too infrequently. Good record keeping can play a role in this. IPMWORKS applied what is called a hub journal in which hub coaches document key aspects and activities of the hub, including descriptions about demo events. It is often felt a bit like a burden for the hub coach her/himself, but it offers opportunities for comparing notes with other hubs. It also relates to hub continuity, in case a hub coach leaves and a new hub coach takes over. Such record keeping provides also useful input for participatory self-assessments with hub members as it provides an overview of all activities of the year.

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- Demo hub **governance** relates to the way in which decisions about the hub are made and who makes the decisions. There are several stakeholders involved in this, notably the organisation that the hub coach is representing, the hub coach, and last but not least: the hub members. Indirectly, agreements made as IPMWORKS partners also play a role because there the organisational set up is agreed in terms of the broader lines such as how many hub members there should be, how many demonstrations are supposed to be organised as a minimum, etc. Who will be hub coach and how this person will be supported by their organisation, are things decided with the partner organisation. Finally, the very specific plans regarding what will be done as part of hub activities, will be decided on interactively with hub members.

Box 1: How farmers become part of the hub

Farmers can be attracted to the demo hub by making use of diverse types of media, adapted to the target group.

Besides a first general introduction of the hub, a follow-up activity (e.g., visit to the farmer by the hub coach) to explain more about the objectives and expectations seem to be valuable.

For the recruitment process, less known networks tend to personally approach farmers from the own network, but for better known networks free access to everybody can be taken as the main approach. When very specific objectives are set for the network, application and selection procedures can be used.

Farmer motivations to participate in a network can vary from intrinsic (e.g. genuine interest to become more sustainable) to extrinsic (e.g., to obtain benefits or because they feel obliged). These motivations can also change during the project.

Important motivations for farmers to join an initiative are: access to new knowledge and experiences, genuine sustainability interests, improving the business case for the farm, getting access to particular funds/subsidies, help improve the image of farming, concerns about toxicity of chemicals, anticipation of new (restrictive) rules and regulations, and loyalty to an organisation or local adviser.

Commitment to participate can be based on trust or go as far as signing official contracts and MoU to make the expectations clear. In some cases, participation is compensated by the initiative in various ways (monetary or in-kind) to commit farmers to the network. But in a lot of cases farmers are not paid or even have to pay themselves to benefit from the services of the network.

These insights come from IPMWORKS Deliverable 1.1, which is based on an exploration of experiences from other initiatives than IPMWORKS.

- Demo hub **financing** relates to the way in which group activities are financed. Demo hub activities involve a considerable investment. In the case of IPMWORKS, much of this could be covered through project funds. This connects to another form of **continuity**, namely whether the demo hub can continue beyond the project period, either by connecting to another project, or by continuing as farmers on an informal basis. IPMWORKS has paid specific attention to this since it takes time to create a learning community and it is a pity if by the time the project finishes, all built-up **social capital** would be lost.

- Finally, there is the **institutional backup**. A hub coach cannot do everything and she/he may not be able to follow up on certain questions of farmers. The better the hub coach is supported by the organisation they represent, a strong network in the particular sector, and good relationships with the wider agricultural community, the stronger the demo hub will stand.

3.2. Activating the pillars of holistic IPM in learning

Advancing the approach of holistic Integrated Pest Management (IPM) can be greatly enhanced through the use of interactive learning (learning as a group through sharing ideas, discussion, etc.) and peer-to-

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peer (i.c. farmer-to-farmer) learning strategies. This involves engaging learners more deeply, promote critical thinking, and support the translation of concepts into practical farm practices.

Holistic IPM means thinking about many things at the same time and considering how appropriate strategies can be developed based on both available options and relevant context. Appropriate processes and methods are needed to help facilitate this. Facilitation of interactive learning and peer-to-peer learning help farmers to translate concepts into concrete and contextualized farm practices. Facilitation is also about helping to situate single pest management techniques into the whole farm IPM strategy.

The use of particular technologies can be explained in a basic way, such as showing how to use a particular machine. Facilitation methods can also help to discuss how such technology relates to a broader IPM strategy of a farm, which includes multiple different techniques related to the 5 pillars. This includes hands-on experiences such as simulating pest management scenarios or exploring life cycles of pests and their natural enemies, which help farmers to understand the complexities of ecosystems and the importance of sustainable pest management practices.

Furthermore, use of presentations and activities that combine insights from biology, ecology, and agricultural science can foster a deeper understanding of holistic IPM. Peer-to-peer learning, in the form of demo hubs, can be particularly effective in the context of holistic IPM. Learners can work together to solve complex pest management problems, share insights, and develop innovative options. Through debates and discussion groups, learners can explore different strategies and perspectives on pest management. This fosters a culture of open dialogue and critical evaluation of various approaches to IPM.

One example of connecting holistic IPM and learning methods is by applying a blend of interactive and peer-to-peer learning activities. For instance, farmers could work together on a (simulated) pest outbreak scenario, during which they discuss potential IPM strategies to manage the situation. Afterwards, groups can share their suggestions in a peer-to-peer exchange with others, inviting feedback and discussion.

3.3. Hub coaches supporting specialists as facilitators and co-learners

Many individuals serving as hub coaches bring a wealth of experience from the advisory sector, often balancing dual roles as both a coach for the demo hub and as advisors to farmers. They are often supported by subject specialists (e.g. a nematologist). In their advisory capacity, hub coaches (with support of subject specialists) are expected to provide current state-of-the-art knowledge in their fields. However, a hub coach also needs to acknowledge that farmers themselves are experts, fostering a learning community where everyone, including the coach, engages in collective learning, thereby cultivating a spirit of collaboration (also see Box 2).

Hub coaches are versatile, assuming various roles that may include being expert, group facilitator, organizer, and networker (Box 3). They connect the hub with external initiatives, industry, and specific information sources, drawing on colleagues' support to manage their multifaceted responsibilities effectively. Being a facilitator entails:

- Bringing together technical expertise and organizational and facilitation skills.
- Acting as both a learning facilitator and a group coordinator.

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- Partnering with farmers in research endeavours

The cultural context plays a significant role in shaping these interactions. In societies with hierarchical structures, advisors (and subject specialists) are often viewed as the primary knowledge holders. Therefore, understanding and adapting to these cultural dynamics is crucial for successful engagement in these roles. IPMWORKS applied a common approach to demo hubs, but this common approach needed to be translated to the specific (cultural, sectoral, and wider) contexts of 14 European countries. Hub coaches are key in adapting the common approach to context specifics. They know specific cultural preferences regarding, e.g. ways of having a discussion, when is a good time to bring farmers together, etc.

Box 2: The changing role of advisors

Advisors in agriculture used to focus on what is called technology transfer: explaining to farmers how to use certain technologies. This meant a tendency towards a problem->solution focus (through particular technologies) and less considering the (farming) system as a whole and considering the appropriateness of options in that light. It also meant coming as "expert" to explain farmers what needed to be done and less on considering farmers as experts as well, interactively weighing pros and cons of particular options and advice. Participatory processes in which advisors and farmers interactively learn about new options and explore how they might or might not address certain challenges and opportunities, will often lead to more appropriate outcomes.

More on this in the IPMWORKS e-learning module on the changing role of advisors (https://ipmworks.net/toolbox/en/#/e_training).

This is also where principles of situational leadership are relevant. Situational leadership[2] is about adjusting styles of leadership (in the broadest sense of the word) to different stages of performance readiness of group members. For example, in scenarios where farmers feel insecure about what is supposed to be done, a more directive approach may be necessary, as they might not be ready to take the lead themselves. Conversely, with confident farmers, a less directive stance, emphasizing coaching or delegation, is more fitting. Adjusting one's leadership style based on the group or individual farmer's dynamics is essential for effective guidance.

More on this can also be found in the IPMWORKS e-learning module 8 on the Changing role of advisors (https://ipmworks.net/toolbox/en/#/e_training).
IPMWORKS Deliverable 1.3 expands further on related topics based on hub self-assessments and interviews with hub coaches in 2022 and 2023.

Box 3: Intermediary role of demo hubs and hub coaches

This social performance orientation also connects to the concept of innovation intermediaries. This is both about the role of the demo hubs as such as innovation and transition intermediaries, and the role of the hub coaches as innovation intermediary for hub members. More on this in e.g. Lybaert et al. 2022.

3.4. Engaging farmers meaningfully

When hub coaches and farmer participants truly collaborate, it cultivates a sense of co-ownership in the hub, transforming farmers from passive receivers of knowledge into active contributors in every phase, from design to evaluation. This collaborative spirit encourages farmers to take on significant roles within the demo hub, such as conducting presentations and organizing farm visits. This fosters a participatory

[2] Read more about this e.g. at https://www.wgu.edu/blog/what-situational-leadership2010.html

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process where advisors and farmers jointly explore new approaches and solutions to challenges and opportunities, leading to more tailored and effective outcomes.

Recognizing the diversity among farmers—each with their unique interests, preferences, and personalities—is crucial. Hub coaches strive to connect to this diversity, tailoring their engagement strategies to meet farmers where they are coming from in terms of their background, concerns, learning needs (Box 4) and also in relation to what they may bring to the hub in terms of experience and capabilities.

This approach shares its philosophy with Farmer Field Schools (FFS), treating farmers as experts in their own right and aiming for co-ownership of the demo hub, albeit in a less formal setting. While not commonly practiced in Europe, the principles from FFS can offer valuable insights for demo hubs, including (Source: IPMWORKS e-learning module 8 on the Changing role of advisors)[3]:

- Adults learn more effectively through active experience than passive listening.
- Farmers themselves determine the relevance and focus of learning topics.
- Every individual's experience is unique and valuable.
- Learning to learn: farmers develop skills to observe, analyze, and make informed decisions.
- Group learning is more effective than solitary learning.
- Employing a systematic approach to learning and demonstrations.

Box 4: Catering to differences in learning needs

In the context of integrated pest management each farmer has to design a complex combination of interacting practices, adapted to a specific farm situation and context, such as area wide ecologies, changing climate, or fluctuating markets. Learning is a constant process in such uncertain and changing situation. Therefore farmers have a constant need for knowledge adapted to local situations, for practical examples, and for applicable information. That is why farmers for example experiment, share experiences, search for advice, visit demonstrations, and read agricultural magazines. But people learn in many different ways and from many different sources.

In order to support farmers in their learning on integrated pest management, we must understand how they learn and what their learning needs are.

These principles echo the fundamentals of adult learning, highlighting that adults opt into learning based on interest and relevance.

To enhance the learning environment and strengthen the hub's social cohesion, attention should also be given to:

- Maintaining relationships within the group to know what is going on people's lives, how they think about things, to be able to connect to this.
- Creating an attractive and engaging environment by fostering social interaction and incorporating enjoyable activities, such as visits/trips, contests, quizzes, or barbecues.

To keep the motivation up during the project it is important to:

1) Connect as much as possible to farmer interests and questions,
2) Foster ownership by keeping farmers involved in the organization and planning of activities without overloading them,
3) Create enough possibilities for (knowledge) exchange and comparison of performance,

[3] Adapted from: Groenweg, K., et.al. 2006. Livestock farmer field schools: Guidelines for facilitation and technical manual. Nairobi: ILRI.

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4) Support trust and a group feeling by actively fostering the development of social relationship through e.g. informal (social) events and communication (e.g. Whatsapp). The use of a WhatsApp group or other digital platforms or online communities can facilitate ongoing dialogue and resource sharing among farmers.

What farmers appreciate in general, is seeing things in the field, seeing live demonstrations of machinery, certainly also drones and robots. When we look at the IPMWORKS WhatsApp group of hub coaches, we see many pictures in the field, in orchards, in greenhouses, etc. Machinery is always a point of attraction.

IPMWORKS Deliverable 1.1 expands further on related subjects.

3.5. Creating opportunities for interactive learning

Interactive learning (i.e. learning together and learning as a result of interacting with others), such as peer-to-peer exchanges, requires more than just conversations and demonstrations to reach its full potential. Recognizing the diversity in farmers' learning preferences is important, as it allows for tailored educational approaches that cater to individual needs, because it means that they may appreciate different types of interaction. Furthermore, embracing a variety of interactive learning strategies can significantly enhance the learning experience. This includes:

- **Diverse Interaction Methods**: This is about methods such as group exercises (more on this in e.g. 5.6.2) and field visits. Tailoring approaches to match different learning styles and the subject matter, ensuring content resonates more effectively with participants.
- **Dynamic Presentation and Discussion Formats**: Utilizing various formats such as presentations, storytelling, Q&A sessions, and discussion groups to foster engagement and deeper understanding.
- **Innovative Demonstration Techniques**: Employing a range of tools from infographics and videos to live demonstrations and farm visits, making concepts tangible and relatable.
- **Experiential Learning Opportunities**: Encouraging farmers to share their own experiments, participate in hands-on activities, and engage in co-created workshops, enhancing the learning experience through active participation.
- **Accessible Learning Materials and Platforms**: Offering a variety of materials like guidance notes and booklets, alongside digital platforms such as websites, blogs, and online forums, to support continuous learning and exchange.

Research from the USA (Krantz et al. 2009) on farmer learning preferences highlights a clear inclination towards practical and interactive methods, such as hands-on activities, demonstrations, farm visits, field days, discussions, and one-on-one interactions. While traditional methods like newsletters, books, and meetings received mixed reactions, less conventional tools like games, comics, and role plays were least favoured, indicating a preference for direct and practical learning experiences.

Opportunities for interactive learning can be enhanced through outward connectivity ensuring the hub interacts with the broader community and is enriched by knowledge and experiences from outside the hub. This can be achieved by:

- **Integrating External Expertise**: Inviting various specialists to share their knowledge, providing fresh perspectives and insights.

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- **Organizing External Visits**: Arranging visits to farms and factories outside the hub, exposing participants to different practices and innovations.
- **Sharing Resources**: Distributing news items, brochures, and other educational materials to keep farmers informed and engaged with the latest developments in their field.

This not only enriches the learning experience but also empowers farmers to actively contribute to and benefit from the collective wisdom of the community.

3.6. Using appropriate facilitation methods and tools

This section may be considered a companion section to the previous one in that it points to ways in which interactive learning can become really interactive by means of facilitation methods and tools.

Based on the findings of the study that we refer to in the above (Krantz et al. 2009) and from general insights on facilitation of group processes we may conclude that facilitation methods can never be said to be good or appropriate in their own right. A facilitation method needs to connect to participants' appreciations, as well as that it needs to be appropriate for the occasion. In other words, facilitation methods and tools are a means, not a goal in itself.

Here, we therefore understand facilitation methods to be any kind of method or process that is employed for the specific purpose of enhancing hub activities such as demo events, hub meetings, and other group activities. Types of methods that may be employed include:

- The general social interaction may be enhanced by having coffee together, using so-called ' ice-breakers, eating together, etc.
- Reflection and exchange can be enhanced through the use of posters with questions, poster discussion, etc.
- A creative learning environment may be enhanced by the use of surveys with immediate results, etc.

There is not one best way to facilitate interactive processes in the hub. First of all, different hub coaches will have different styles of doing things. This gives the facilitation style a personal touch. In chapter 4, we discuss related issues further. Some may like to organise meetings in a strictly planned order while others will be inclined to keep the programme more informal and facilitate processes more intuitively as felt appropriate at the time. Apart from that, there are cultural preferences regarding the degree of formality that need to be considered when choosing an appropriate facilitation style and tools. As this is only a brief introduction to the demo hub performances areas, we will expand on the variety of options in terms of facilitation methods and tools in chapter 5.

3.7. Navigating social dynamics

Facilitating social interactions is not just about tools and methods. Rather, it is first of all about dealing with social dynamics, some of which are more and other less predictable. The social skills that we will discuss further in the next chapter, are very much about the ability to navigate such dynamics. Part of it is about skills and part of it is about the art of working with groups of people and helping them flourish. There is no way in which a comprehensive list can be given of possibly social dynamics that hub coaches may need to deal with. The following are some examples:

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- **Conflict management**. In case of conflict between hub participants, or between a participant and the hub coach her/himself, or between a participant and a visiting subject specialist, there is a need for conflict management. This is about acting in such a way that the conflict does not jeopardise the purpose of the meeting, demonstration, or other event. Reasons for a conflict can range from being about differences in opinions and power struggles, to simple misunderstandings. A key principle is to not ignore a (looming) conflict, but try to take out the sting that is causing the conflict. This may be by helping two persons to understand each other better. Or it may involve bringing the relevant facts to the table. Or it may involve asking people to watch their words and formulate criticisms in a way that the recipient can handle[4].
- **Attention for personal circumstances**. A demo hub is not just about 'business', but about a learning community. Hub members have a private life in which things may have happened or are happening that are difficult for that person to deal with. Being aware of this is the first step, but it may be appropriate to talk privately with that person to at least acknowledge how this may have an effect on the person's participation in the group.
- **Responding to sensitivities**. For several reasons, including changing government regulations, farmers may be upset, even to the extent that they lose part of their interest in IPM. It is important to acknowledge this, and take time to talk about this.
- **Time management**. It can be quite a hurdle to find a time when all (most) hub members can participate in a meeting, demonstration, or other event. It requires both timely planning and flexibility when suddenly, e.g. due to weather conditions, things need to be rescheduled.
- **Ensuring continuity**. To be able to build something up as a group in terms of knowledge, perceptions, or attitudes, it is important to follow up on what was discussed earlier and which requires discussion in future.

Many things are outside the sphere of control and sphere of influence of the hub and hub coach, notably government policies and regulations, market conditions, and societal perceptions. This may undermine motivation of hub members to actively work towards applying holistic IPM. One of the challenges for hub coaches will be to acknowledge the limitations of what the demo hub can do/change, while at the same time articulating what *can* be done and the advantages of not waiting for policies, regulations, etc. to change, or identifying ways to work around related obstacles.

Chapter three provides further examples on e.g. handling (socially) difficult situations in a hub.

3.8. Readiness quick scan

If you are involved in setting up a demo hub, the following quick scan may be used to get a sense of the extent to which you are ready for having an effective IPM demo hub. It may also be useful to use this quick scan only after consulting chapter four and five.

[4] There are whole books written about the topic of conflict management. A quick introduction can be found here: https://www.linkedin.com/pulse/introduction-managing-conflict-mike-griffiths

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Table 1. Quick scan to assess readiness for effective IPM demo hubs

Quick scan topics	Very much so	Yes	Some what	Not at all	What to pay particular attention to?
1. A clear approach to advancing IPM practice in place and a hub coach well-acquainted with it					
2. An appropriate organisational setup and institutional backup for the hub in place					
3. Hub coach and experts ready to play role of facilitator and be co-learners					
4. Hub coach acquainted with principles on how to engage farmers meaningfully					
5. Hub coach acquainted with ways to create opportunities for interactive learning					
6. Hub coach acquainted with a variety of facilitation methods					
7. Hub coach prepared for dealing with difficult social situations in hubs					
"Score":					

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Further reading and references

This guidance document only provides a selection of useful practices, processes, methods and tools associated with social skills in demo hubs. There is much more available. We are already incorporating a number of methods and tools from the Nefertiti project. Many of these tools and methods are available in a range of European languages. In the following web locations, you can find general guidance:

- https://trainingkit.farmdemo.eu/ "This website collects all interesting tools, guidelines and videos that can help you in organising a successful farm demonstration, both on farms and online."
- Croplife International (2019) Facilitator's manual. Introduction to Integrated Pest Management. Updated version. https://croplife.org/wp-content/uploads/2019/04/Facilitators_ManualFinal.pdf
- The first two chapters from The Discussion Group Facilitator's Handbook https://www.teagasc.ie/media/website/publications/2020/The-Discussion-Group-Facilitators-Handbook.pdf
- The contribution of facilitated group learning to supporting innovation amongst farmers https://www.redinnovagro.in/documentosinnov/The+contribution+of+facilitated+group+learning+to+supporting+innovation+amongst+farmers.pdf
- D1.1 of I2Connect (2020)- Connecting advisors to boost interactive innovation in agriculture and forestry https://i2connect-h2020.eu/wp-content/uploads/2021/09/i2connect_Final_Deliverable-1.1_correctedversion.pdf
- Krantz, N.K. et al. (2009). How Farmers Learn: Improving Sustainable Agricultural Education Executive Summary/Research Brief. Accessed 5 June 2024: https://eesd.tennessee.edu/wp-content/uploads/sites/242/2021/10/HowFarmersLearnResearchBrief.pdf
- Lybaert, C.; Debruyne, L.; Kyndt, E.; Marchand, F. (2022). Competencies for Agricultural Advisors in Innovation Support. Sustainability 14, 182. https://doi.org/10.3390/su14010182
- IPMWORKS Deliverable 1.1 on Good practices for learning and adoption of IPM practices in IPM hubs and networks
- IPMWORKS Deliverable 1.2 on Lessons learned on the impact of the demo IPM hubs on the adoption of IPM practices through the case studies
- IPMWORKS Deliverable 1.3. on Analysis report of the hub self-assessments
- IPMWORKS E-learning Module 8 – Changing role of Advisors (https://ipmworks.net/toolbox/en/#/e_training)

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4. Social skills and capabilities for effective demo hubs

This chapter expands on topics related to the key performance areas of demo hubs that we presented in the previous chapter. Here, we reflect more elaborately on social skills and capabilities which enhance the ability to put the IPMWORKS demo hub approach into practice. As mentioned in the introduction, this is not just about hub coaches, but is relevant for all who directly or indirectly influence the way in which a hub can function.

4.1. Social skills, attitudes, and competencies in demo hubs

In this section, we further unpack the variety of ways in which the hub coach influences processes in the demo hub. In doing so, we build strongly on the work of Lybaert et al. (2022).

Figure 6 provides a summary of different dimensions of social skills required by hub coaches. The first two dimensions, *basic dispositions and attitude* and *people skills*, form the **personal basis** for a hub coach. It is important to realise that this does not involve formal training and relates to basic prerequisites.

As for the *three types of competence*, this forms the **professional basis** of the hub coach. The *on-going reflection and learning disposition* is closely related to this as it is about ensuring that the professional basis keeps being updated.

In the following, we will briefly elaborate on each of these dimensions.

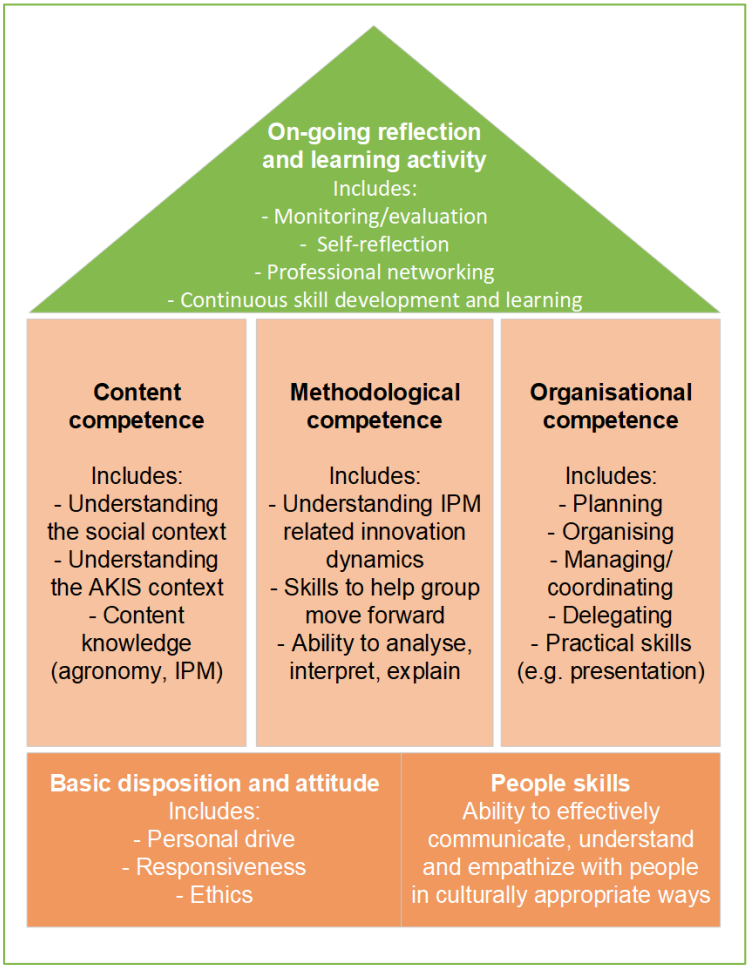

Fig. 6. Social attitudes, skills, and competences relevant for hub coaches (adapted from Lybaert et al. 2022)

Basic dispositions and attitudes

This is about who you are as a person. It is not so much about skills, but about how you approach life, how you are inclined to relate to other people, and about your personal qualities such as resourcefulness (ability to arrange things needed) and responsiveness (ability to respond effectively). It is also about what interests you in the topic of IPM and about your personal motivations for your job, and for working with the demo hub members.

This dimension already determines much of how you will be perceived by demo hub members.

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People skills

This is about skills that come naturally because of personality traits (for some more than others) and about skills you have gradually learnt as you grew up: how you communicate, your ability to connect to other people and respond to their needs, as well as your ability to know what are (culturally) appropriate ways to express yourself, to respond to others, and to engage people in activities.

Content competence

This is about what many are inclined to focus on when selecting hub coaches: what do they know about the wider agricultural knowledge and innovation context in a particular country/region, and how experienced are they in relation to agricultural practice in general and about (holistic) IPM specifically. Obviously, this is important so that farmers consider the hub coach sufficiently competent to guide the hub and for being able to make informed decisions in relation to activities and the hub connectivity. However, there are different levels of competence. Hub coaches need to have enough experience, but they can also bring in additional expertise. We have seen this work well in a number of IPMWORKS hubs where hub coaches were not very experienced, but had access to a good network and were able to cover the needed content expertise in this way. So, yes, this is an important dimension, but 'just' one dimension to consider.

Methodological competence

This is about the ability to be methodical about the hub life: enabling a process of gradually building up knowledge, working towards attitude change, and helping move forward in relation to the practice of things demonstrated and discussed (also see Box 6). It involves analytical skills, applied social skills, and often even research skills at least in terms of knowing the systematic processes underpinning research. See section 4.2 and Annex 1 for examples of being methodical and structuring demo hub meetings and events.

Organisational competence

This is about practical skills related to planning and organizing activities. Being a good advisor does not automatically mean that one will also be a good organizer. But it is a critical competence, because if, e.g., the logistics of an event have not been properly covered, this will not be made up for by good intentions. Particularly here, we refer to the next section which is about collective capabilities.

Box 6: Methodological competence involves thinking systematically

Adamsone-Fiscovica et al. (2021) suggest 'Nine Ps' as a way of thinking systematically in relation to e.g. demo events:

- Purpose: Setting a clear and jointly agreed objective at the outset.
- Problem: Identifying and framing a topic tailored to farmers' needs.
- Place: Selecting a physically and socially accessible and credible site.
- Personnel: Ensuring a motivated and trusted team of organisers and facilitators.
- Positioning: Identifying, addressing, and reaching the target audience.
- Programme: Designing a balanced set of formal and informal activities.
- Process: Aligning the form and content of communicated knowledge for different learning styles.
- Practicalities: Ensuring the provision of suitable basic infrastructure and limiting distracting external conditions.
- Post-event engagement: Reinforcing the demonstration message and following up with the participants.

The hub coach does not need to be able to do everything herself/himself. However, it is critical that the hub coaches know when and who to ask for support.

On-going reflection and learning activity

This could have been included as part of the basic dispositions, but we identify it as something specific to highlight because it relates to the way in which one handles competences and professionality in general.

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It is about staying curious about new things, being able to self-reflect, being able to upgrade knowledge and competences, but certainly also about staying modest because of the on-going learning process that we are all in (or should be in). But also about the extent to which this is put in practice.

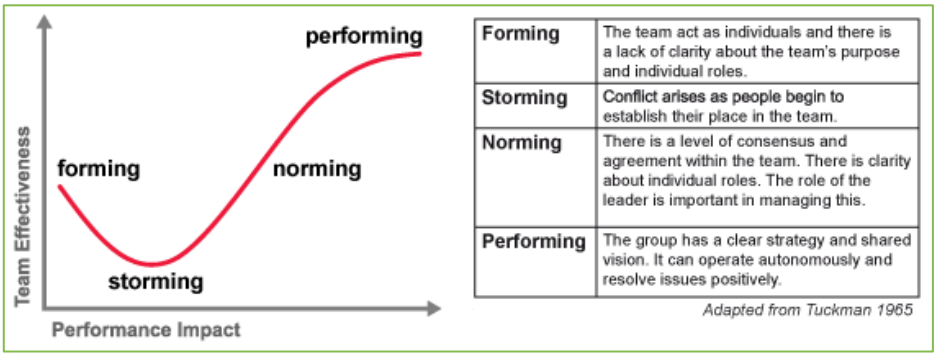
This section may be considered pivotal section in the sense that it provides in a short overview the key aspects of what makes for effective hub coaches, illustrating how much of the effectiveness of a hub coach is about who you are as a person and how your relate to people in general. How this translates into practical insights for hub coaches is discussed in more detail in IPMWORK deliverable D1.3.

4.2. Dealing with group dynamics in demo hubs

Group dynamics refer to the patterns of interaction between members within a group, which influence how the group functions and achieves its goals. Positive dynamics, characterized by trust and open communication, can lead to more successful knowledge exchange and farmers choosing to apply innovative practices. In contrast, negative dynamics, such as conflict or lack of engagement, can hinder these processes.

Involving farmers directly in exploration processes is important to enable them to select agricultural innovations that are practical and tailored to their needs. Group dynamics play a critical role here, as the collaborative nature of these processes requires strong interpersonal relationships and mutual respect among participants. Managing these dynamics effectively is part of the challenge for hub coaches.

Group dynamics can be influenced by various factors, including personal characteristics of participating farmers, cultural differences, economic conditions, and regional agricultural policies in Europe. Hub coaches play a vital role in guiding group interactions to ensure that collaborative goals are met amidst these dynamics.



Forming	The team act as individuals and there is a lack of clarity about the team's purpose and individual roles.
Storming	Conflict arises as people begin to establish their place in the team.
Norming	There is a level of consensus and agreement within the team. There is clarity about individual roles. The role of the leader is important in managing this.
Performing	The group has a clear strategy and shared vision. It can operate autonomously and resolve issues positively.

Adapted from Tuckman 1965

Fig.5. The phases groups or teams go through.

Bringing together 10-15 farmers in a group does not automatically make them really a group. It takes time and facilitation by a hub coach to establish a certain level of trust and group feeling. In many cases, a group process will follow four phases as outlined in Figure 5[5] for setting up teams in organisations.

It helps to be prepared for the time of storming that may take place, as well as actively facilitating the process of moving through norming to performing. The group development process will not be linear. After initially starting to perform as a group, they may run into differences of opinion, etc. and go back into a storming phase.

Key roles of hub coaches in managing group dynamics

- **Create structure and establish agreement**

[5] Source: https://warren2lynch.medium.com/traditional-to-scrum-team-forming-storming-norming-and-performing-3fd5fd1f5ea9

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Farmers need a shared focus and purpose to become and remain a group. The hub coach needs to facilitate this process. What is the purpose of the demo hub, and what will it be doing? This is not for just the beginning of the hub – the purpose and how this translates into activities will need to be reiterated from time to time. It includes creating clarity about why what is being planned and done in relation to that overall purpose. The purpose and plans will also need to be communicated. Unclear plans and unclear communication about appointments, meetings, and plans, leads to frustration and will undermine commitment of hub members to the group.

- **Create a safe space**

Part of paying attention to the group dynamics relates to paying attention to basic human needs. Farmers may easily be apprehensive and insecure about joining the hub. Think carefully about what makes people feel comfortable in the group up to the point of freely sharing their opinions. Also, think carefully about what you can or cannot share in the group, and/or about a particular member.

The hub members themselves also have a role to play in creating a safe space. Their attitude and behaviour may put off other hub members and make them feel uncomfortable in the group. If you are a conflict avoider, you may let undermining social dynamics go on for too long. Humour can often help to take the pressure off a tense atmosphere, as long as it is not part of a systematic negligence of situations that participants feel uneasy about. E.g., if a hub member talks and acts in ways that put off other hub members, consider taking that person apart and try to help that person see the negative impact of her/his actions. It is a tricky area and there is no guarantee that this will always work out.

Help people to **listen** to each other and "listening people in". Listening-in a person happens by carefully listening not only to what is being said, but also to the emotions behind it, and or what can be understood from listening between the lines. Ask questions that are not only about what is said, but also about how people feel about things, or things you sense he/she finds difficult to express. As part of the group culture, make sure people listen to each other, and be creative in getting people to listen to those that talk less.

- **Create shared ownership**

If participants in the group feel shared ownership of and co-responsibility for the demo hub, this creates a strong basis for being in it together, and together feeling responsible for making the demo hub a success, not just the content part, but also the social part. Making agreements as group regarding basic shared norms on how to interact as a group (e.g. in discussions), how to work together, what to do and not do as a hub, etc., will help to create shared responsibility for the well-functioning of the hub. We elaborate more on this in section 3.2.

- **Adapt your role as hub coach over time**

This relates to situational leadership[6] principles we also discussed earlier: Your role in the beginning may need to be rather "directive" in terms of explaining what needs to be done, and what will be done. Gradually, you will need to start delegating more, and be less in front of the group and more part of the group. The challenge is to know when you need to take more the lead, and when you need to start expecting more from the hub members and leave more to their initiative.

[6] E.g. see https://situational.com/situational-leadership/

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4.3. Collective (social) capabilities as demo hub

We started this chapter by putting the subject of group dynamics on the table. A group is a group for a number of reasons. One is for having the same leader, or in this case the same hub coach. However, certainly also from a situational leadership perspective as discussed in 3.1, a group harbours a range of competencies and capabilities in all the hub members. **The more these can all be put at the service of the hub activities, the better the hub (group) will function.** This is about establishing co-ownership and co-responsibility. In this way, the hub (group) will not be limited to what the hub coach can bring to the table.

So here we are talking about the collective capabilities of the hub. The hub coach would ideally seek to harness what all hub members can contribute to the variety of activities of the hub, and not doing more than is really necessary for her/him to do.

In the following, we apply this idea through the lens of a framework that was developed for living labs (Bouwma et al. 2022). Figure 7 summarises twelve core capabilities, in terms of collective capabilities of the group/hub, that each helps to enhance the efficacy of the hub.

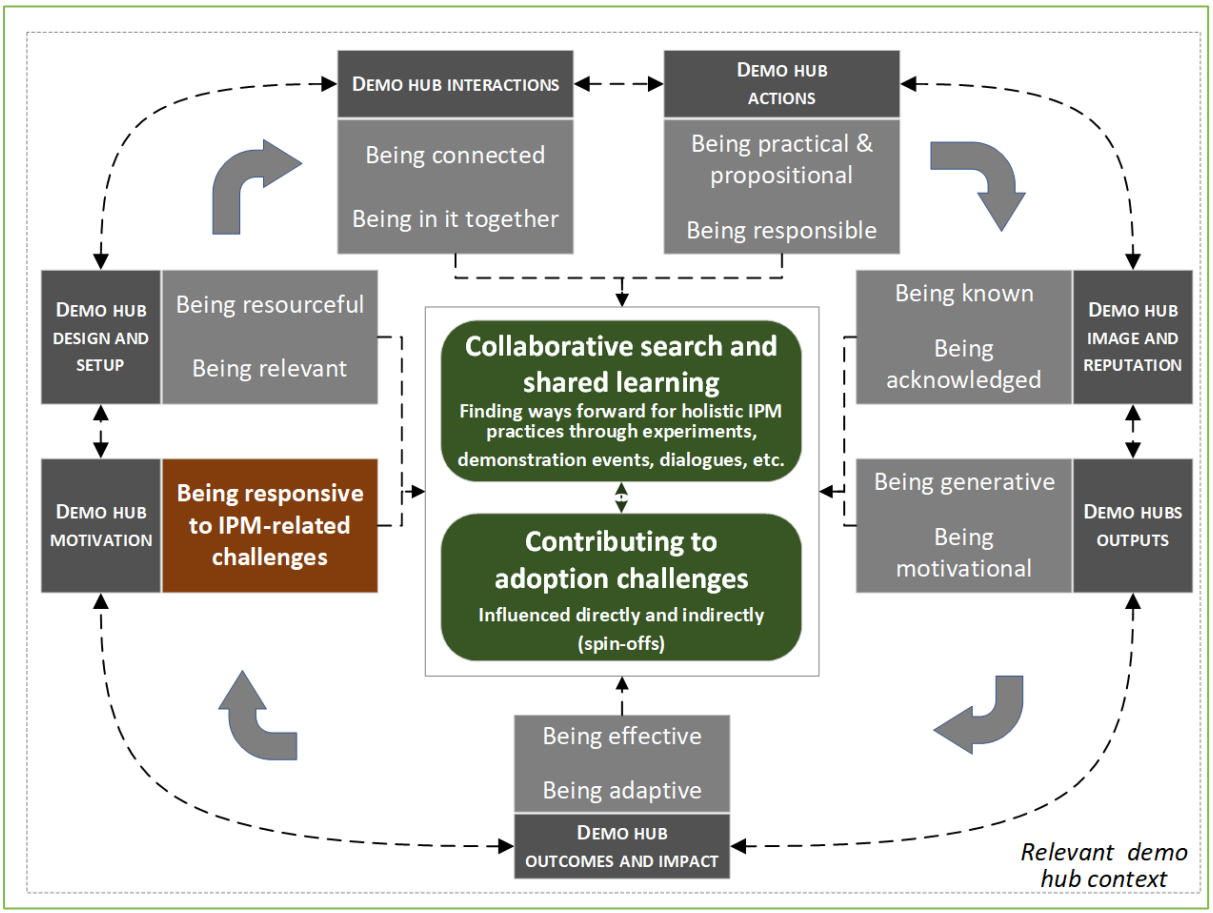

Fig. 7. A perspective on collective capabilities in a demo hub (adapted from Bouwma et al. 2022)

In the following, we briefly identify what the twelve core collective capabilities are about (adapted from Bouwma et al. 2022). So this is about different capabilities of the hub/group, not just about the hub coach.

Being responsive. This is about the origins of the demo hubs and why they were created in the first place. It is about concern for the environment and for the sustainability of agriculture. It is about the motivation

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to help reduce the use of pesticides in agriculture through (holistic) IPM practice and a sense of urgency related to this for various reasons.

Being relevant. This is about being relevant in two ways: relevant in view of agricultural sustainability, but also relevant for farmers in relation to challenges they face and in relation to the on-the-ground realities that they have to deal with.

Being resourceful. This is about being able to secure resources (time, funds, knowledge, networks) needed to organise relevant and good quality demo hub activities.

Being connected. This is about being connected to other actors (outside the demo hub) and to other initiatives and developments related to (holistic) IPM. In other words, it is about preventing the demo hub from being an island and ensuring appropriate (outward) connectivity.

Being in it together. This is pivotal for being able to see co-ownership and co-responsibility materialize. It is about having good relationships between the hub members and creating opportunities for building co-ownership and co-responsibility. This includes appropriate involvement of hub members in planning and evaluation of activities, but is also about organising fun activities such as barbecues or another social activity, especially when suggested by hub members.

Being practical and propositional. This is directly related to the motivation of farmers to keep participating. Unless something practical done, farmers will lose interest. This means that much of the hub life will need to take place outside in the field, and not in meeting rooms watching long presentations (though there may be a place for that too).

Being responsible. This is about balancing the need for being practical with a concern for quality, potential side-effects and long-term effects, and trade-offs between different values, etc. This requires a conscious effort to always consider possible implications of what is being presented and demonstrated. It is also about being critical about what is and isn't addressed in the hub, preventing that the focus remains only on what is easy to do rather than on what is really needed to be done. It involves being anticipatory (able to foresee implications and consequences of actions), reflexive (monitoring how things work out), responsive (picking up early warning signals) and inclusive (considering implications and interests from a broad perspective).

Being known. This is about the reach of communication and providing appropriate information for those outside the hub so that farmers and others will be more inclined to visit demonstration events. In this way, the hub can be inspiring for others to start apply (holistic) IPM as well.

Being acknowledged. This is about reputation management—being able to articulate the relevance, efficacy, and quality of what the hub is doing. It is also very much about quality management, ensuring the professionality and (scientific) accuracy of things being proposed.

Being generative. This is about an ability to bring forth concrete products and services, notably demonstration events, but short videos and other products may be part of this as well.

Being motivational. This is about by connecting to people's core motivations. Notably also in terms of being able to motivate farmers from outside the hub to visit demo events.

Being effective. This is closely related to being generative, but goes a step further. IPMWORKS demo hubs are meant to support a movement towards widespread application of holistic IPM. So this is about influencing the application of IPM knowledge, attitude, and practice beyond the demo hub itself as well.

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Being adaptive. This partly relates to group dynamics (see 4.2) which asks for on-going adaptation of plans so that they connect appropriately to farmers' interests and time schedules. But it also relates to what we described as on-going reflection and learning disposition in the previous section and the ability to adapt to a changing context of the hub, such as related to changing regulations.

The twelve collective capabilities may be used as a checklist to assess how the hub is doing as a group/collective. It may also be used as part of a participatory evaluation at the end of the year, generating insights on what may need to be better addressed in the next year.

4.4. Applying practical wisdom in demo hubs

Besides knowing about the right facilitation methods and tools, there is also something called practical wisdom, which is about knowing what to do when.

Practical wisdom is described by some as a virtue and others as a skill. Perhaps it is best characterised as the ability to apply a variety of things to decision-making in a particular situation that asks for wisdom because it is complex with many things to consider simultaneously. This may involve memory of past experiences, knowledge, sometimes a moral compass, intuition, an ability to read between the lines of people are saying, quick insight into (possible) implications of different choices, and more.

Not everything in the life of a hub can be anticipated and there will certainly be surprises on the way. Impromptu decisions will need to be made. There will then be no time to apply methods and tools. It is up to your best judgement to decide how to respond/what to do. Be prepared for that and be relaxed about it in the sense that it is only natural that certain things will take you by surprise. This is where basic dispositions and attitude, and people skills as referred to in section 3.2 often make the difference.

One type of example of when practical wisdom is needed relates to may be called **hub coach nightmares**. For example:

- A hub member emotionally explodes in a meeting. Everybody is upset and does not know what to say or do.
- Half of the group does not turn up at a meeting even though it was formally agreed.
- Some important logistical matters have not been taken care of for a demo event.
- Some hub members experimented with some IPM methods, but it totally failed, which cost them quite a lot – they are about to just give up and leave the hub.
- Visiting farmers are very critical about what they see and hear at a demo event.

So what would you do? This is not the place to provide generic advice. As hub coach, you will need to there-and-then decide how to respond. And that is where practical wisdom is needed. This cannot be trained for as much as it is good to be aware about this, understanding that the facilitation of group interactions is not just a matter of following methods, tools, and tips & tricks, but very much also about being there as a person and bringing to bear all your life skills in guiding the group process.

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Further reading and references

- Lybaert, C.; Debruyne, L.; Kyndt, E.; Marchand, F. (2022). Competencies for Agricultural Advisors in Innovation Support. Sustainability 14, 182. https://doi.org/10.3390/su14010182
- Practice-led innovation networks in agriculture: a guide for facilitators (2017) https://hennovation.eu/onewebmedia/D5.2%20Facilitation%20Guidelines%20FINAL.pdf
- IPMWORKS Deliverable 1.1 on Good practices for learning and adoption of IPM practices in IPM hubs and networks
- IPMWORKS Deliverable 1.2 on Lessons learned on the impact of the demo IPM hubs on the adoption of IPM practices through the case studies
- IPMWORKS Deliverable 1.3. on Analysis report of the hub self-assessments
- IPMWORKS E-learning Module 8 – Changing role of Advisors, and Facilitate a group meeting (https://ipmworks.net/toolbox/)
- Helpful general tips and tricks:
    - https://www.sessionlab.com/blog/facilitate-a-meeting/
- Comprehensive discussion group facilitator's handbook:
    - https://www.teagasc.ie/media/website/publications/2020/The-Discussion-Group-Facilitators-Handbook.pdf
- Adamsone-Fiskovica, A., Grivins, M., Burton, R.J.F., Elzen B., Flanigan, S., Frick, R., Hardy, C. (2021) Disentangling critical success factors and principles of on-farm agricultural demonstration events, The Journal of Agricultural Education and Extension 27 (5): 639-656. https://doi.org/10.1080/1389224X.2020.1844768
- https://www.mindtools.com/pages/article/newLDR_86.htm
- https://hr.mit.edu/learning-topics/teams/articles/stages-development

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5. Facilitation methods, processes and tools

This chapter may for many be the to-go-to chapter in terms of finding practical examples of facilitation methods, processes and tools. It is not always possible to distinguish exactly between what we call a method, tool, or process. When discussing tools, you will often find us talking about a method to apply the tool, and when talking about methods we may be referring to particular tools that can be used as part of a particular method.

5.1. How to choose facilitation methods, processes, and tools

Chapters three and four provide basic outlooks on social skills so that the application of facilitation methods, processes and tools does not become mechanical, as kind of quick tricks to get people to do something, but based on a well thought through social interaction approach. Methods, processes and tools are means and not ends in themselves. That is why we start with a section on making good choices regarding when, how, and what methods, processes and tools to apply.

The decision to apply facilitation methods, processes and tools can be for multiple purposes, which include:

- Creating a relaxed atmosphere (e.g. using so-called icebreakers);
- Supporting a reflection process with hub members;
- Enabling all hub members to participate in discussions (not just one or two doing most of the talking);
- Structuring discussions;
- Having more focussed and in-depth conversations.

Facilitation methods, processes and tools are means to an end. It is important to always keep the purpose of applying particular methods or tools clear when considering their application. The following things need to be considered:

- Which outcome do we want to achieve as a result of applying a particular method, process or tool? Which interaction process can contribute to this? Methods, processes, and tools are not good/appropriate by themselves, but can only be considered like that in relation to the **purpose** they are meant to serve.
- What is the **preferred** interaction style for farmers? In 2.2.5 we already discussed the fact that farmers tend to prefer certain ways of interaction and dislike others. This will also be different for different cultures/regions. What method, process, tool fits that particular context and related preferences? At the same time, and this is where the subject of practical wisdom comes in, sometimes farmers (and people in general) would never choose by themselves to participate in a

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particular social interaction process, but once they do, they may find themselves enjoying a group activity that they would have been very hesitant to join if they had not been asked to do so. So it also about getting a feel for what is appropriate in stretching farmers' inclination to stay on their own.

There is a Dutch saying that roughly translates as "what the farmer doesn't know, he doesn't like". Which means that people may be holding back from participating in something they don't know about and have no experience in. However, a learning process means also being stretched and going beyond the sphere of the known and experienced. This applies to IPM practice, but also to the participation in interactive processes. Facilitation methods can help overcome inhibitions towards engaging in discussions and reflection processes.

So the bottom line is that the hub coach will want to know whether the application of a particular method or tool is going to help and not hinder the process. **Over-facilitation** means making the application of methods and tools a purpose in themselves. That is not going to be helpful. A hub coach prepares a programme for a meeting or demo event that includes some methods and tools, but some elements may need to be dropped if during the activity you find out that there has been enough interaction facilitated and it is good to just let the discussion go as it goes.

The use of facilitation methods will be different for different stages of a meetings or event (adapted from Gordijn et al. 2018):

- Getting started: How do I introduce a learning process and get started with the hub members? What method could help in this?
- Networking and interaction: How do I build new connections in the group and stimulate interaction?
- Forming opinions and starting a discussion: How do I challenge existing ways of doing things (in farming practice) and stimulate people to look beyond what they are acquainted with or what they have 'always' done in a certain way?
- Gaining an overview. How do I help people to see the bigger picture and focus on what matters most to them?
- Structuring and analysing: How can I support people to get some order and structure in the complexity of things to consider?
- Contemplating: How do I invite people to take a step back and reflect, creating space for new thoughts?
- Stimulating creativity: How can I stimulate people to think outside the box more?
- Energising the hub members during meetings and events: How do I stimulate levels of energy and playfulness in the group?
- Future application: How can I stimulate that people think about how they could apply what they saw/learned?
- Closing the meeting: how can I come to a conclusions and evaluation?

5.2. Ways to organise demo hub meetings and events

This section provides some practical examples on how to ensure a good structure when facilitating interactions within a hub. This can be done in a number of ways and it is not specific for the context of IPM demo hubs.

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5.2.1. Creating a good learning environment

Before we share examples of methods that help in organising and guiding demo hub meetings and events, we list a number of good practices that help create a conducive environment for having good group dynamics.

Working with ice breakers

Ice breakers are short activities that improve the social atmosphere in the group usually at the start of a meeting or event. Participants in such meeting/event may be apprehensive about what is to come and they may not have been interacting with each other much. Ice breakers help to create a person-to-person interaction to become more at ease with the rest of the group and to become more inclined to really participate and engage in the following activities.

Ice breakers are not knowledge orientated. They often include some fun and laughter and help to create a more relaxed atmosphere in the group. There are many different ways to do this, and the following websites are just a few of many where you can find examples:

- https://www.mindtools.com/pages/article/newLDR_76.htm
- https://www.sessionlab.com/blog/icebreaker-games/
- https://museumhack.com/list-icebreakers-questions/

Including fun/social activities

A hub is about bringing together people with a common interest, more specifically farmers with particular learning needs and interests in relation to farming in general and to IPM specifically. This means it is very important that there is time and opportunity to meet, to enjoy a coffee or meal together, to chat, and sometimes to just have fun. Humour (of course in appropriate ways) plays an important role in creating a good group atmosphere.

This is also why cross-visits (demo hubs from one country visiting a demo hub in another country) are generally appreciated very much. Much of this often relates to the whole social process of travelling together, and having time for informal and relaxed interactions on the way. But, of course, this can also be done by together visiting places of interest nearby. IPMWORKS Deliverable D1.1 elaborates on this topic on the basis of the experience of demonstration hubs and farmer networks across Europe.

Getting feedback

Get regular feedback on what farmers enjoy (and not) as the demo hub continues. Do not assume you know, but create opportunities for open sharing of opinions about how things are going, including bilaterally. Ask for suggestions on how things can be made more enjoyable or relevant. Even better: also delegate responsibility for monitoring how the hub is faring to hub members. This may include giving feedback to each other. Help hub members to **give and receive feedback** in a helpful manner. Easily, the one receiving feedback can feel offended, or the one giving feedback may feel like he/she is not listened to. So bring it in the open and make it clear that giving and receiving feedback is something that can be difficult. Tips on this can be found here:

- https://virtualspeech.com/blog/advice-for-giving-and-receiving-feedback
- https://www.mindtools.com/pages/article/newTMM_98.htm

Getting feedback on how hub members and visitors from outside appreciated demo events helps to improve such events. IPMWORKS designed a particular exit poll format for this (see annex 2 for the template that was used by quite a number of the hubs). The experience of IPMWORKS hub coaches shows that it takes an effort to define appropriate questions and design an appropriate format for getting

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responses in relation to such questions. There is no fixed method for this. Above all, it is important that such exit poll is feasible, not complicated to fill out/respond to, and do not ask for more than is really needed (it is not about a research project). More on this in IPMWORKS Deliverable D1.3.

Shared ownership and co-responsibility

Find ways of giving appropriate responsibilities for the hub life to participating farmers. Within appropriate limits, consider how hub members can be co-facilitators by taking on a particular role in hub interactions. If possible and acceptable, it will enhance ownership and will reduce the burden of the hub coach.

Possible roles that you might ask hub members to take on:

- Time keeping (e.g. per meeting);
- Hosting activities/meetings;
- Bringing cake/cookies;
- Help clean up after event/meeting;
- Be monitor of a meeting/event – providing reflection afterwards (clarify task to the monitor)
- Send reminder to rest of the group a few days before an activity/event/meeting;
- Checking that everyone who wants to participate in a discussion, gets a chance;
- Ask a farmer to present relevant data;
- Ask farmers to explain their own demos.

Clear planning and programmes

When plans and programmes are unclear, group members will become uncertain about processes and may not be as much inclined to fully participate as they don't know what to expect or what is expected from them. Also, without a clear plan, it will be difficult to work together in a clear direction.

Having clear plans does not mean that they are carved in stone. Someone has said that planning is critical, but plans are there to be changed as found needed. It is about a continuous process of planning and not about something that is fixed and then strictly implemented. Be ready to make changes to the plan if the situation asks for it. And, as noted earlier, asking regular feedback will help to adjust implementation of plans in an appropriately flexible way.

Box 7: Example of the variety of dynamics at play in facilitating a particular hub event. This reiterates the importance of preparing well for meetings and events.

- Asking the hosting farmer what the main information he/she wants to get out of the group.
- Flipchart with crop cultivation scheme (timeline) printed on it to structure and visualise the testimony of the farmers in time.
- Flexibility in planning if the interest is going to different topics as planned.
- Assuring confidentiality by stating that some information is confidential.
- Exhibition displaying pest, traps, information folders, prints with zooms, etc.
- Explain lifecycle of the pest and how it damages the crop.
- Giving an overview of all possible practices that can be included in a strategy against a pest.
- Asking to prepare and bring something of their farm, e.g. putting up a trap and bringing it to examine it during the demo.
- Demonstrating and explaining how to recognise a pest on an actual sample of pests. Also letting the farmers try and practice how to recognise pests.
- Hand out samples and brochures that farmers can take home.

Source: Simon Lox

The Design Guide for On-Farm Demonstrations provides very good guidance for planning demonstration events (https://trainingkit.farmdemo.eu/demo-design-guide/). Annex 1 provides an example that was shared with hub coaches in IPMWORKS on how to **prepare** well **for meetings** and how to do so in a systematic way.

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Further guidance can also be found in IPMWORKS E-learning module 8 on "Facilitation of a group meeting in your hub" (see reference list). The key reason for why it is important to think carefully about how meetings are planned for, is to prevent disappointing meetings.

A clear approach to what fosters learning processes

Learning activities should have clear learning objectives, be practical and be applied to certain context and farmer's needs. Group discussions, on-farm demonstrations and webinars are the most common activities, but also group exercises or co-designing a farm management plan could allow to bring in the holistic approach to IPM.

It is advised to combine multiple complementary types of learning activities, interactions and formats into an entire learning programme, as pieces of the holistic IPM puzzle. On-farm is the preferred meeting location for both hubs and demonstration activities. Frequent meetings are an important lever for hubs.

Learning activities can vary in:

- learning objectives,
- theme or topic,
- format (often linked to location or platform),
- activity (what you do in a certain format),
- location and the timing of an activity,
- type of information shared,
- the different actors involved including their number and role,
- the learning tools that are used,
- the facilitation methods used and
- the level of interactions and rules.

(the above is based on a more elaborate discussion that can be found in IPMWORKS E-learning module 8 – Let's talk about IPM (accessible at https://ipmworks.net/toolbox/en/#/e_training).

Method 2 in section 5.2.2 provides a way of approaching the above in a systematic way.

Record keeping

IPMWORKS, following the example of the H2020 NEFERTITI project, has worked with what is called a hub journal. Hub coaches would keep record of basic information about the hub in a number of overviews: about the focus and objectives for the hub, about hub participants (anonymized), about hub event topics and a reflection on how they worked out, about key insights from cross-visits (in other countries), and about an annual assessments of the hub.

The idea was to provide key information for the project, but it was clearly also meant to be of use to the hub coach her/himself, if only as a reference to all that was done as a demo hub. Also, if a hub coach changes, this will be an essentially resource for the new hub coach, as a kind of 'institutional memory'.

5.2.2. Examples of facilitation methods and tools for organising demo hub meetings and events

The methods shared in the following are examples. It will give you an idea about what may be done, but you may develop your own ways of facilitating interactive reflection based on e.g. specific cultural preferences of farmers. Also, in each case, the suggested process of applying the method is open to adaptation to better suit the particular purpose you have for using the method. *We will not repeat this for sections 5.2.3., 5.2.4, 5.2.5, and 5.2.6, but there the same principle applies*.

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Example 2.1: Following a systematic checklist in developing a plan for meetings/events

Purpose of the method: If you have a checklist of things to think about in developing a plan for meetings/events, you don't have to reinvent the wheel every time again. It is like going on holidays. If you have a list of the things you need in terms of (e.g.) camping gear, you don't need to think every vacation again about what should be packed.

Process: Annex 1 shares an overview of things to consider in building up a plan for a meeting/event. This includes a template that can help in creating a clear outline that can be shared. You may want to adapt it, but it is good to have such reference so that you can 1) prepare more efficiently, and 2) prevent that you forget something.

Example 2.2: Preparing a good flow of activities for a meeting/event

Purpose of method: This method helps to structure a meeting in a helpful way by paying attention to six steps/elements regarding meetings and events: 1) how to start, 2) what to do, 3) what exactly to show, 4) what discussions to have, 5) how to stimulate thinking, 6) how to wrap up and conclude.

Process: In preparing for a meeting/event, consider how exactly you will go about addressing those six steps. Also consider how to appropriately divide the available time over these six elements to create a good balance.

This method is discussed in more detail in IPMWORKS Deliverable D1.2.

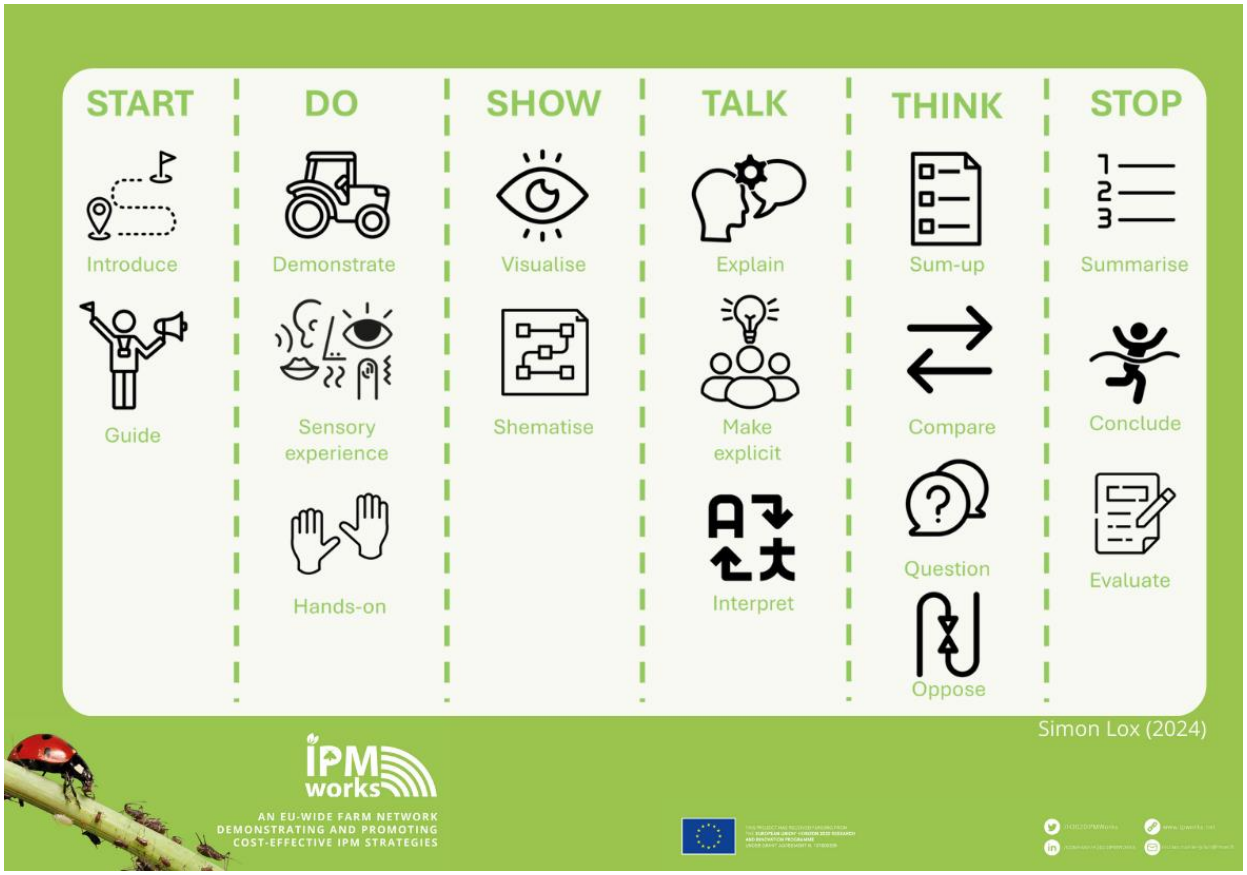

Fig. 8. Six steps for creating a good flow in a meeting/event. Source: Simon Lox.

Elaboration:

How to start?:
Introduce & frame: why are we here?
Guide: Follow up on the introduction and keep clear why what is done.

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What to do?:
Demonstrate: Show practical examples of what can be done.
Create sensuous experiences: Create a closer appreciation of the subject.
Hands-on activities: Preventing that things become too theoretical.

What exactly to show?:
Visualise: A picture says more than a thousand words.
Schematise: Create order and overview to make material more accessible.

What to talk about?:
Explain: Address questions.
Make explicit: So it can be discussed and addressed.
Interpret: Go from the what, why, how questions to: so what does this mean and what can be done?

How to stimulate thinking?:
Sum-up: Making key messages more compact so insights become clearer.
Compare: In comparison, differences will help point better to key insights.
Question: Probe farmers to ask questions and do not assume too much.
Oppose: Don't accept every thought that comes up but create a healthy quest for truth.

How to wrap-up/stop?:
Summarise: Same as sum-up.
Conclude: Draw interactions to an end so there is closure.

Example 2.3: The facilitation checklist for supporting rich learning on IPM

Background

The following is based on IPMWORKS E-learning module 8 on "Let's talk about IPM".

There are a variety of types of information and knowledge involved in farmers understanding particular pest-related problem situations, to understand the concept of IPM, and to redesign their pest management strategies. These could be considered the minimum of topics on which a farmer needs knowledge in order to understand, accept and interpret IPM practices and strategies. One may say that if a farmer thinks of IPM she/he thinks of all the following aspects. The topics are framed within an experiential learning theory, because farm demonstration networks are designed for social learning based on shared experiences. This theory demonstrates that to learn something from an experience and from others, different modes of thinking are needed: retrospective, critical, analytical, rational and personal thinking.

A more complete version of this method can be found in IPMWORKS Deliverable D1.2.

Purpose of method:

The idea is that having a simple checklist of different types of considerations (modes of thinking) that may be part of a learning process, can help ensure appropriate diversification of things to consider in relation to a specific (demonstrated) topic.

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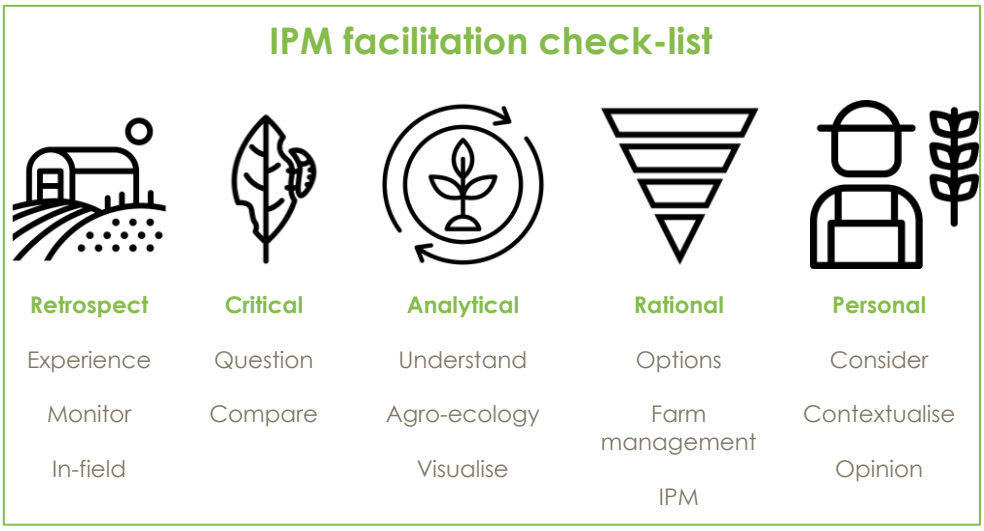

Fig. 9. A suggested way to ensure that appropriate angles on a particular topic are addressed during a demonstration or other events. Source: IPMWORKS E-learning module 8 – Let's talk about IPM

Process:

It is advised to combine multiple complementary types of learning activities, interactions and formats into an entire learning programme, as pieces of the holistic IPM puzzle.

Retrospect: Go in the fields, show, and take sufficient time for the host farmer to testimony and for the other farmers to also share their experiences.

Topics that could be addressed for this mode of thinking are:

- The crop and/or field history
- The practices and/or underpinning strategies implemented
- What pests, diseases, weeds occur

Critical: Question the problems and opportunities of the field or farm you are visiting. Ask how this situation differs or resembles the other farmers' situations.

Topics that could be addressed for this mode of thinking are:

- Making problems explicit: what exactly is part of it
- Effects of pest/disease, or of a particular practice
- Relevant context factors and conditions
- Information source & data
- Exploring options to address problems
- Comparing observations and ideas to other experiences/situations

Analytical: Understand the biology of the problem and how it interacts in with the agro-ecological situation. Bring in expert information and visualise.

Topics that could be addressed for this mode of thinking are:

- Exploring evident and possible causes
- Creating an overview of biological cycle and properties
- Connecting to ecosystem and climate conditions
- Considering the cropping system as a whole

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- Cultivation processes
- Decision making
- Ways of doing things
- Purpose orientation (e.g. why are things done)

Rational: Collect all experiences and ideas of the farmers on how to prevent and cure crop damage. Frame options in farm management and crop plans and define them as one of the IPM principles.

Topics that could be addressed for this mode of thinking are:

- Variability (how things can work out differently under different conditions)
- Efficacy
- Functionality
- Durability/Sustainability/Affordability
- Quality parameters
- Path dependency (already having been doing things for a long time)
- Production implications
- Labour needs
- Ease of use

Personal: Make sure that the how, when, where and why of practices is clear. Ask for personal opinions on why certain practices would or wouldn't fit in other situations. What would be the barriers or opportunities for changes on different farms.

Topics that could be addressed for this mode of thinking are:

- What are implications for (the need for additional) resources
- What opportunities are feasible
- How do opportunities relate to the farm's core business
- What is the future outlook – what is reasonable to expect
- What does it mean in light of past experiences
- What does it require in terms of labour needs
- What are perceived risk
- What does the farmer appreciate, including in terms of aesthetics/appeal
- What are relevant personal interests
- Farmer community (e.g. peer pressure)

Possible additional considerations: Consider wider context issues.

Topics that could be addressed for this mode of thinking are:

- Power issues at play in e.g. the sector
- Policies, laws and regulations and how they influence IPM strategies
- Ideas /perspectives on the future of farming and how this affects decision-making
- The role of other actors in the value chain

This method description is adapted from IPMWORKS E-learning module 8 – Let's talk about IPM (accessible at https://ipmworks.net/toolbox/en/#/e_training).

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5.3. Ways to facilitate interactive reflection

Reflection is an essential part in a learning process. Reflection can be just a brief moment of of thinking. Reflecting through open brainstorming may be a good start of the reflection process, but there is a good chance that this will be biased into a particular direction and not bring things to the table that are important to consider. Reflection can help participants translate what they saw and learned to how it may fit in their own farming context, it can help to evaluate an activity, it may be part of evaluating how the hub as a group and in terms of activities is functioning. Depending on the purpose of reflecting, different ways to facilitate this will be found appropriate. The general idea behind reflection is that **deeper and/or more elaborate reflection will lead to deeper insights**. There are many ways in which such reflection can be helped and facilitated. In the following, we provide a few suggestions, but once you get the idea, you may find many alternative ways in which reflection can be facilitated.

5.3.1. Organising reflection processes

Process options are about the practical setup in which you facilitate the reflection. Under content options we will discuss the structure of how then, in that particular setup, a reflection may be facilitated.

Examples of how an interactive reflection may be set up:

- Have an open discussion in the field during which you provide prompts by asking a range of questions that help unpack relevant issues;
- Take some kind of structure with you into the field on which you can attach a poster that will be used in the reflection;
- Have the interaction in a barn or room nearby;
- Go have a cup of coffee in a restaurant and facilitate the interaction there;
- Set up a computer with projector/screen in a room, restaurant, or barn, and use Mentimeter or other app to ask questions to which farmers can respond and see the answers given. And then each time, what appear on the screen can be the start of some further discussion.
- In terms of the use of posters, one may opt to write responses of farmers (in short) as they are shared, or have sticky notes and ask farmers to first share their thoughts on a sticky note put them on the poster, and then have the discussion. The advantage of the second approach is that you prevent that only 2-3 farmers provide responses.
- Photographs or videos made can be used for reflection later on, if there is not much time for reflection right at the end of the demo event.
- A webinar may be organized if that works for the particular topic area, and e.g. with a panel there an interaction with the audience through the chat. This may be a way of reaching a larger audience.

IPMWORKS Deliverable D1.3 provides more elaborate insights on this based on the experience of the IPMWORKS hub coaches in 2021-2023.

5.3.2. Examples of facilitation methods and tools for reflection and evaluation of hub activities

We already referred to posters and other means through which the reflection can be facilitated. Here, we elaborate on the contents of what may be put on posters in terms of the type of questions you may ask. It is probably obvious, but do use the language that farmers feel comfortable with. So any of the following examples will need to be translated into a local language. Annex two shows some more examples.

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Example 3.1: Simply asking questions that help unpack different aspects of a demonstration

Purpose: Asking many different questions can help unpack issues involved in e.g. a particular demonstration.

Process: The following are just some of the kind of probing questions that can be used in unpacking relevant issues. Think about what will be good questions to ask before the meeting/event to prevent you only ask standard questions.

- What did you observe and hear about in the explanation (of a demonstration)? Was it

- about solving a technical problem? If so, how?
- about saving money/ being cost efficient? If so, how?
- about convenience of use? If so, how?
- about connection to market demands? If so, how?
- about government regulations? If so, how?
- about personal motivation? If so, in what way?
- about overall farm strategy and farm context? If so, in what way?
- Other?

- What are strong and weak points in the demonstration?

- Would you consider choosing to apply the (IPM) method/practice demonstrated? Why yes, why not?

The IPMWORKS E-learning module 8 on the Role of demonstrations in adoption of IPM elaborates further on this way of facilitating reflection.

Example 3.2: The ORID structure of a particular order of asking questions

Purpose: Similar to methods 2 and 3 presented in section 5.2.2, this method is about creating a good flow and structure in asking questions and by doing so deepen the reflection. A key purpose of this method is to prevent jumping to quickly to conclusions before carefully considering what is exactly observed, what it may mean, and what evidence there is to base a later conclusion on.

Process:

ORID stands for **O**bservation, **R**eflection, **I**nterpretation, **D**ecision. You may post the four words on four separate posters and note down the responses as you go, or you may ask farmers to write their responses on sticky notes first and put them on the poster, and then facilitate a discussion along the lines of what was shared.

Observe – What do/did you see (descriptive)? Before entering a discussion, it is good to not jump to conclusions, but first spend time to reflect on what exactly is/was observed. Note down what has been observed. Sometimes or even often, by spending more time to reflect on what was/is observed, the following reflection/interpretation will change.

Reflection – What do you make of this? Why is it like this? This is about problematising what is observed: what could be the reason for this? Again, do not move on to the interpretation too soon (not jumping to conclusions). What could be possible explanations?

Interpretation – So what? What does it mean for me/others? What are the options/opportunities? What relevant insight is something to take home and/or to further investigate/try out?

Decision – Now what? What will you do? Prevent leaving the process with an open end.

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Variation on ORID

Figure 10 shows a variation on the ORID method. We include the *Check* in this variation to indicate that it is good to not just reflect and interpret, but also to use the peer-to-peer interaction for checking one's own thoughts and interpretations.

Figure 11 elaborates the same, providing an example of what such process may look like in relation to mechanical weeding:

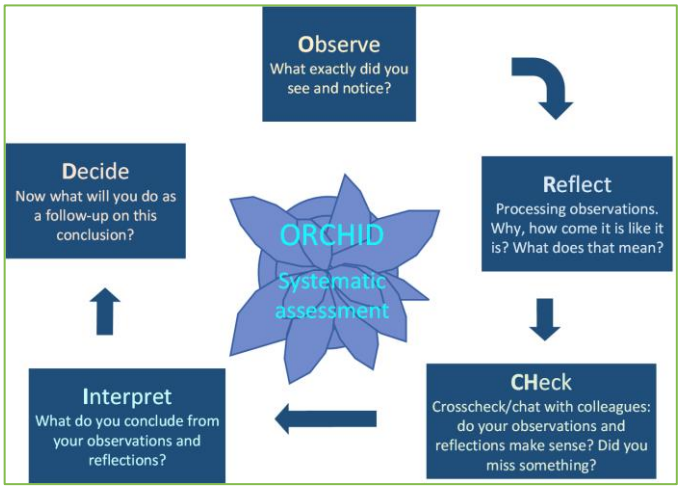

Fig.10. Variation on the ORID method

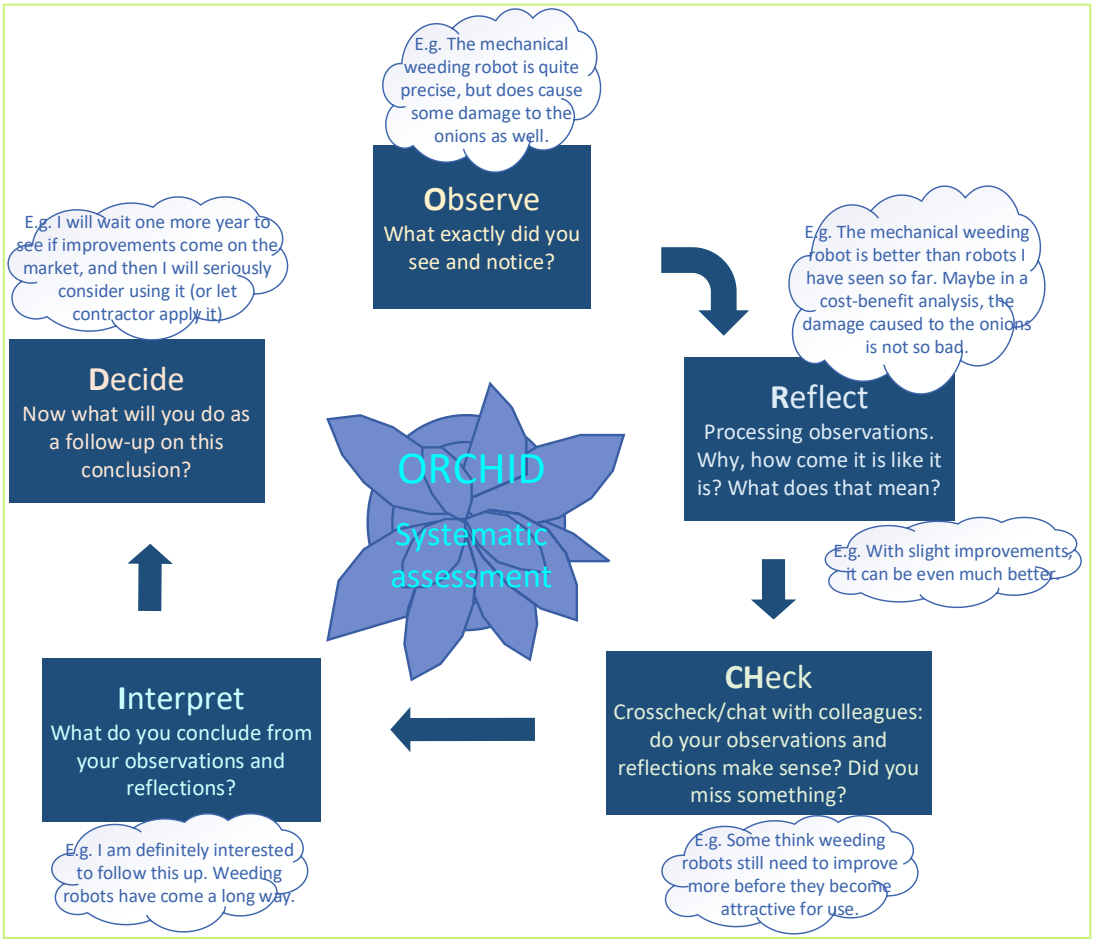

Fig. 11. Illustration of the application of the adapted ORID method

Example 3.3: Exit polls at the end of demo events

Purpose: Getting feedback from those visiting a demo event. This feedback can help improve preparations and implementation of future demo events.

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Process:

One of the challenges in working with exit polls is that farmers are not always interested in writing down their responses to questions when they are leaving. Having some people (e.g. students) help with this by actively approaching visitors and have a very short interview and then writing down their responses may be an option to get more feedback. If possible, an App like Mentimeter may be used as well. The IPMWORKS experience anyway shows that 1) it is important to get good feedback, but 2) it may be challenging to get farmers (the visitors) to provide such feedback. So this refers back to the topic of preparing well for demo events and considering what would be a good approach in your situation.

Annex 2 shares the exit poll template that was used by many IPMWORKS demo hubs. It was meant to be adapted (particularly question 6) according to the specific topics that were demonstrated. Also, it was meant to be translated in the appropriate local language.

Some hub coaches used this as a reference in created an adapted exit poll by reducing the number of questions, or by adding specific questions that they wanted to get feedback on. IPMWORKS deliverable 1.3 discusses the topic of exit polls and how they may be adapted to suit one's specific purpose more elaborately.

Example 3.4: the triple P reflection

Purpose: Using a simple approach with just three key words to create variety in reflections on what farmers observed and thought of a particular demonstration. The **triple P** reflection (Figure 12) is about approaching (the demonstration) from three angles. It can be used at the end of the entire demonstration event.

Process:

The three key words are about the following questions:

Pearls – What are the really nice things did you see/hear? What did you enjoy?

Puzzles – What raises questions and/or what looks interesting but you have questions about it – what questions?

Proposals – What can be done to make use of the insights that came up?

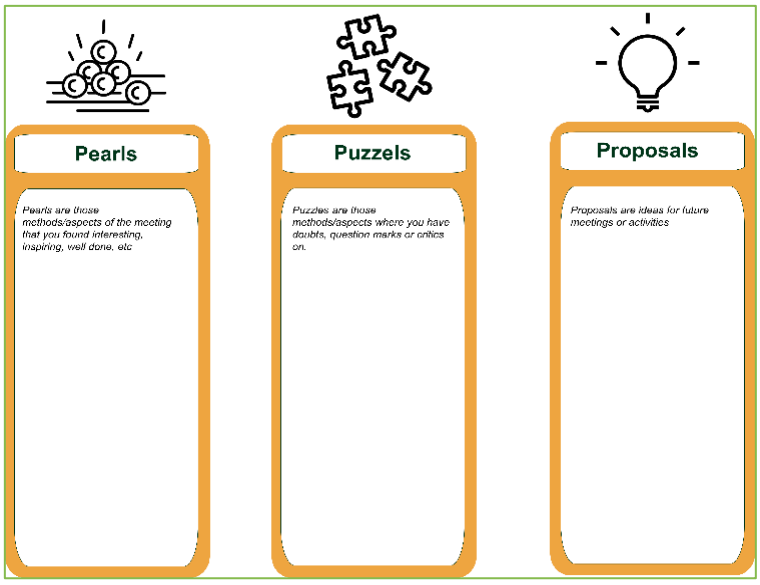

Fig.12. Considering "pearls", "puzzles", and "proposals". Source: NEFERTITI/FarmDemo.trainingkit.farmdemo.eu

You may make posters with the three key words on them, and attach them to a wall or something else. Then provide post-its/sticky notes and pens and ask farmers to first write down their thoughts in brief and put them on the poster. Also depending on how much time you have, you may do this one poster at a time, or ask them to provide their thoughts in relation to all three posters at the same time. Then have a look at what they wrote down and interactively discuss thoughts and ideas that were shared. You may also use Mentimeter or other app for these three bigger questions.

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Example 3.5: Reflection leading to sharing advice

Purpose: This is similar to method 3, using three different ways of reflecting on what was heard/observed. Also here, it can be used at the end of the entire demo event.

Process:

This method may be used, for example, during a cross-visit when you go visit another farm in the neighbourhood (not part of the hub) or even in another country.

1. Put the elements of Figure 13 (of course translated into the local language) on large sheets of paper, or altogether on one very large sheet (A0) and put it up so that all can see it.
2. Explain the general idea of this exchange

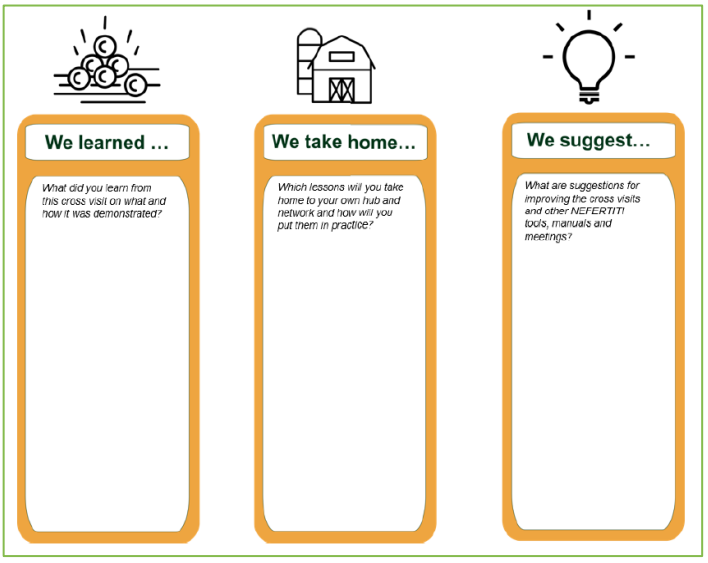

Fig.13. From reflection to advice. Source: Triste, L. (2021) Guidelines for conclusion at a demo event. NEFERTITI/FarmDemo.trainingkit.farmdemo.eu

3. Give the participants 3 post-its/sticky notes and give them 5 minutes to write down one aspect they learned, one aspect they will take home and one aspect they would like to improve to the project on one post-it respectively. After the 5 minutes, let everybody one-by-one explain what they wrote down and let them stick their post-it on the template. The others respond to this.
4. Summarise what is on the post-its/sticky notes for the three topics in some key messages/insights.

Example 3.6: Video-making

Purpose: Making video material of hub activities can be very useful in a variety of ways. Key parts of demonstrations can be filmed and edited (in a simple way or more elaborately). This can be posted on Youtube to share this with a wider audience. It can also be shared with those farmers who could not participate in the event so as to keep them connected. But it can also be useful as reference material to be used during winter sessions when farmers (depending on the sector) have more time to reflect on what was done. This is also an opportunity to bring some variety in terms of the type of interactions in such meetings. Consider including short inverviews.

Also, demonstrations often only show something at a particular point in time. You may make short videos about how things continued later in the season and add this to the video to be shown and discussed in winter.

Process:

A webinar on video making from the NEFERTITI project can be found here: https://www.youtube.com/watch?v=X6RrLpjcN3Y&list=PLOYrtkIDkcdSeJ8vOzjgymg-0LZUZxBWF&index=7

Guidelines for video making can be found in the FarmDemo Training Kit (scroll down on the page to the second bullet): https://trainingkit.farmdemo.eu/demo-design-guide-for-virtual-demonstrations/

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5.4. Ways to evaluate demo hub activities periodically

5.4.1. Self-assessment

Demo hub activities can be evaluated directly at the end of activities as the examples in the previous section refer to, but they can be evaluated periodically, for example, at the end of the year. The purpose is then not just on the specific activities, but also on the wider way in which they added value (and in what degree) to the general purpose of the demo hub. So then the overall question is: how is the demo hub faring? It involves looking back at the variety of activities of that year, drawing conclusions and using this as input for making plans for the next year.

5.4.2. Examples of facilitation methods and tools for evaluating demo hub performance

Example 4.1: A visual calendar for reflecting on activities over the past year

Purpose: Creating an overview of activities done as a demo hub over the past year so that farmers can recall what was done, and then asking what they liked most (and what least) and why. This can then also inform a discussion on what plans for the next year would be good to make.

Process:

Facilitating a general reflection (self-assessment) in relation to what was done as a hub over the past year may work better if a visual calendar is produced such as the example in Figure 14.

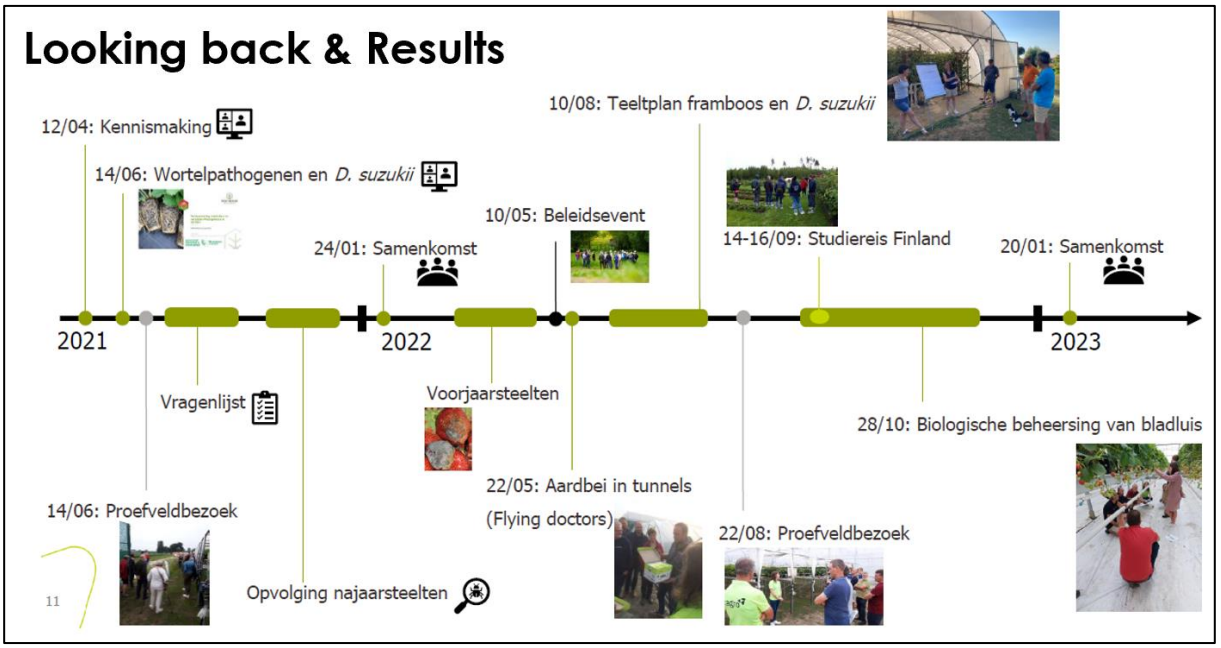

Fig. 14. A poster setup that can help interactive reflection on activities that took place over the year (this example comes from an IPMWORKS demo hub in Belgium)

An interaction along such lines can be further facilitated by providing stickers in the form of coloured dots through which hub members can indicate what they appreciated most and what was less relevant. This can be followed by discussion.

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Example 4.2: Use of posters to organise input/feedback

Purpose: Facilitate a reflection on a broader topic related to the purpose of the demo hub (and the participating farms in it), and doing so in way that all participants can contribute easily.

Process: In terms of the use of posters, there are many ways to do this. Figure 14 is just one example of how a poster can be used to 'harvest' ideas from the group. Just having open discussions will often lead to 2-3 persons doing most of the talking. First providing post-its/sticky notes and pens and asking hub members to share ideas and then only have the discussion, can lead to richer exchanges.

There will be practical implications associated with these process options. E.g., you may need posters (pre-printed or empty), you may need a structure to put up a poster somewhere, you may need (masking) tape, you may need post-its and pens/markers. Make sure you make arrangements for this.

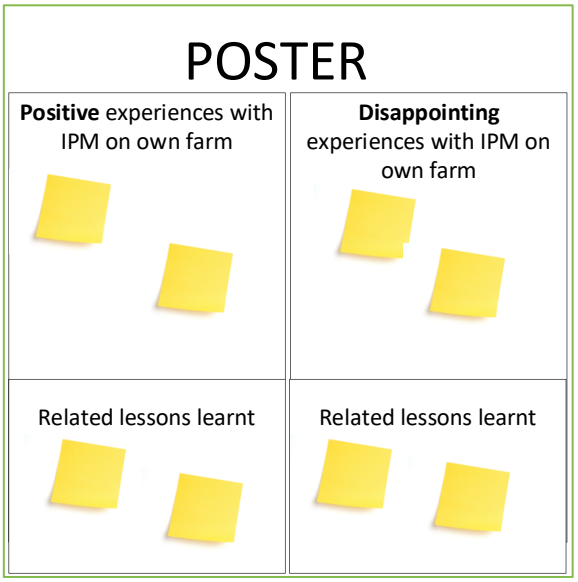

Fig.14. Example of how posters may be used to facilitate the participation of more hub members in discussion

Example 4.3: Translating an integrated assessment into a quick overview

Purpose: This may be used for reflecting on activities of an entire year, or in reflecting on a subject that has many factors involved. Participants are asked to first score in relation to a number of statements or questions, and then this can be transferred to a spider diagram.

Process: The example below is about a hub self-assessment at the end of the year. Ideally, the scoring is done anonymously, e.g. by providing pieces of paper on which they provide their scores which you then transfer to the spider diagram, or through something like Mentimeter.

Example of the piece of paper you may use to hand out to hub members to provide their scores on.

Questions relate to this year (2023)	My score:
1. Were interactions within hub relevant and effective?	
2. Were interactions within hub enjoyable?	
3. Were interactions within hub efficient?	
4. How satisfied are you about application of IPM on your own farm (does it work)?	
5. Were the demo events well organised?	
6. Were the demo events convincing for visitors?	
7. Were/was the cross-visit(s) useful?	
8. Have (changing) conditions outside the hub influenced your ideas on IPM?	

1=not at all ; 2=not really ; 3=partly, partly not ; 4=yes ; 5=very much so

See below an example of the spider diagram that Excel can automatically generate for you. **But**, again, you can do this on just paper (a poster) as well, thus skipping the work with Excel. You then also don't

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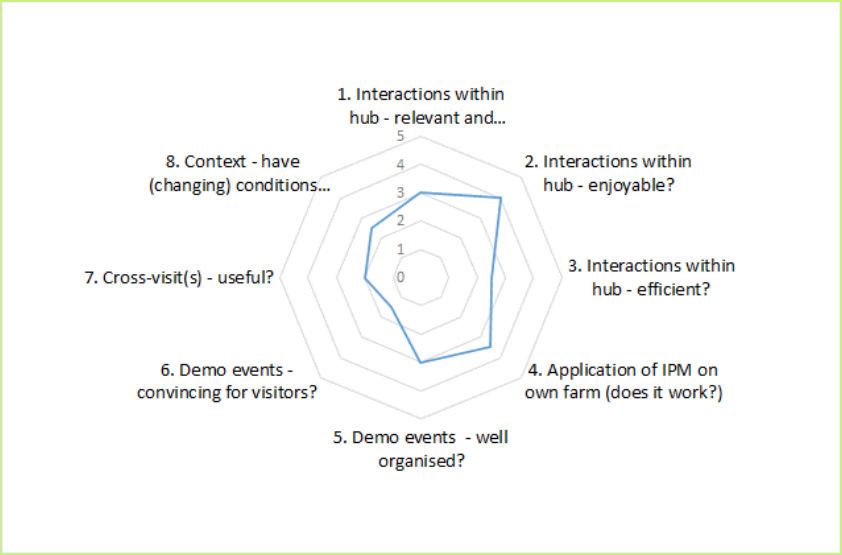
need to handout those slips of paper. That may actually be advisable. But then you need to prepare the outline of it in advance.



5.5. Ways to facilitate interactive learning on IPM

What is presented in this section is discussed in much more detail in IPMWORKS Deliverable 1.2, which presents insights from a number of detailed case studies on IPMWORKS demo hubs.

5.5.1. General options for making things visible and touchable

There are many ways to enhance a learning process related to IPM. E.g. making things more visible and touchable, will always help. Examples of this are:

- With a spade making a hole in the ground to discuss soil properties helps to connect more closely to the topic of discussion.
- Prepare a glass sided box to see the root structure of crops – rooting depths – started up lots of conversations.
- Have buckets of crops in order of the rotation and examples of end product. Participants can move these around in the process of discussing optimal rotations.
- Show reference materials of the pest in ethanol.
- Show specimens of relevant taxa that relate to activities/practice under discussion.
- Support demos by also sharing collected data on the extent to which the particular option demonstrated works.
- Show pictures of root colonization by Trichoderma analysed in the lab.
- Doing a farm/field walk to explore the crop/field is a common practice. This may also be done specifically within a flower strips/hedgerows to see what is in it and to discuss what it (potentially) does).
- Create a farm tour setup. At different stations, an expert presents on a different topic and shows something specific, e.g. 2 plants of a particular crop – one with pest damage, and one without that guests can look at/touch.

This connects to the principle that learning is enhanced if it involves seeing and touching (experiencing). The methods we discuss in the following, are more about creating a conceptual-practical understanding about relevant topics.

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5.5.2. Examples of facilitation methods and tools for facilitating interactive learning on IPM

Example 5.1: The holistic IPM conversation method

Purpose: The goal of this method is to help hub coaches diversify conversations with farmers on different aspects of holistic IPM. They help to talk about aspects related to IPM that are not (immediately) visible but very important.

This method was developed by Simon Lox within the frame of IPMWORKS. It can serve as a checklist for hub coaches, providing prompts for going deeper into specific aspects of holistic IPM. The seven conversation types may be used in relation to one demo event, but a hub coach may also decide to focus on some types during one demo event and on other types during another demo event.

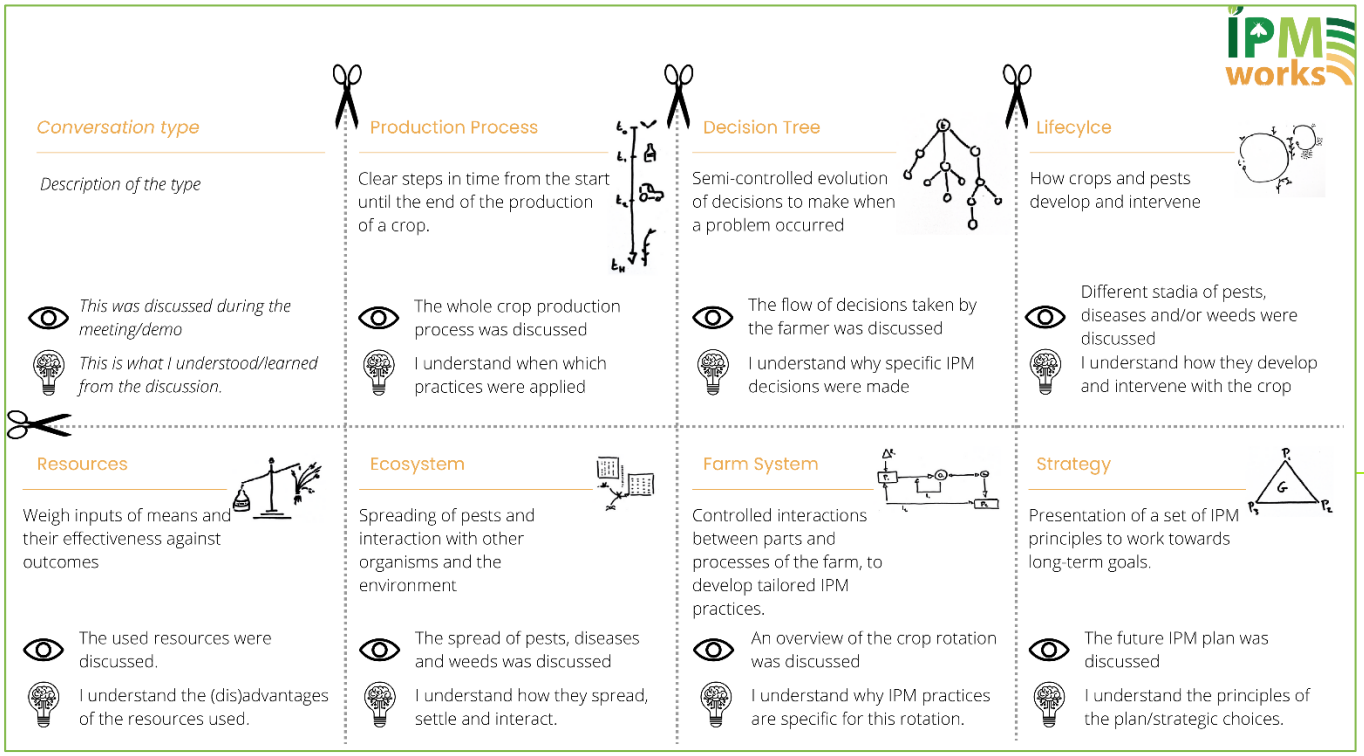

Fig. 15. The holistic IPM conversation method developed by Simon Lox

Process:

- Print the contents of Figure 11 (most probably you will want to develop your own version in the appropriate language and possibly with adapted text).
- Cut out the seven cards with the different topics.
- Give one card to each of the participants in the event, and ask them to pay particular attention to the extent to which this aspect of holistic IPM was addressed. The eye symbol has the key question that relates to this. E.g., in relation to Production Process: to what extent was the whole crop production process discussed? The related reflection question is next to the lightbulb: to what extent is it clear to you when which practices were applied as part of the production process? Further questions may include: What do you think about this?
- So during the event each one will pay particular attention to those questions, but, of course, they are encouraged to also look at the entirety of what is demonstrated.

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- At the end, each participant is asked to reflect on the demo event on the basis of that particular topic, and this can be followed by a further discussion as a whole group in relation to that topic.

Probably this is not something to be done at each demo event, but it can be a way of making participants/hub members more aware of the different (holistic IPM related) aspects of demonstrations.

Example 5.2: Application of the classic iceberg metaphor in relation to IPM related questions

Purpose: Considering root causes to help think beyond mere (short-term) problem solving.

Process: Guiding question (example): see Figure 16.

Step 1: Why is this weed, disease, pest a problem?

Step 2: What are the main causes why it became a threat?

Step 3: What are underlying reasons why it could become a threat?

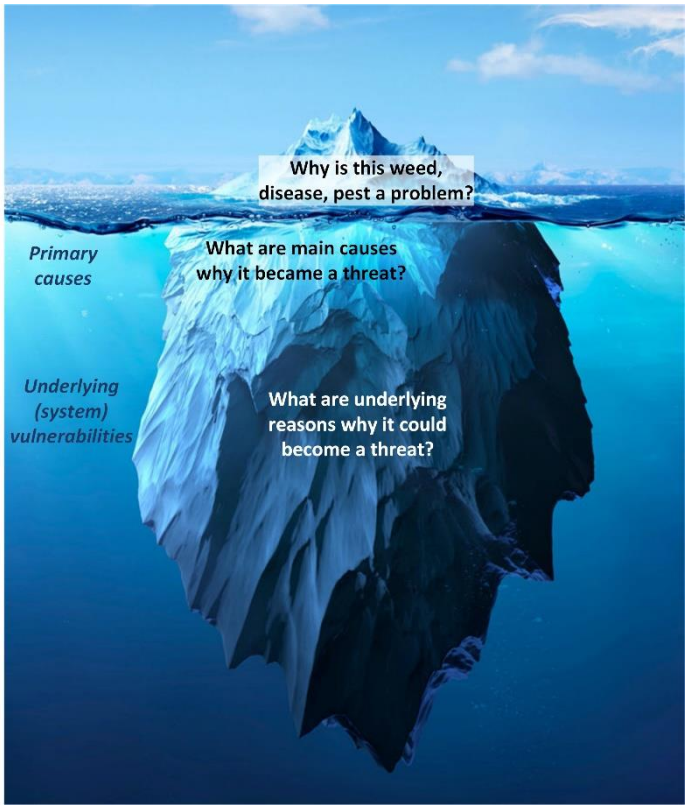

Fig.16. The iceberg metaphor to understand root causes of pests, diseases, and weeds better.

Example 5.3: The seasonal calendar

Purpose: Creating an overview of developments/actions/evolutions over the year to get a better idea about related dynamics. And creating this interactively with hub members.

Topic	J	F	M	A	M	J	J	A	S	O	N	D
e.g. occurrence of pest												
Life cycle												
Soil preparation												
Etc.												

Process:

1. Create a calendar overview on a large sheet of paper
2. Describe the subject in the first column.
3. Interactively discuss with the host farmer and/or hub members the relevant status/dynamic for each month of the year.
4. When finished, discuss what insights this provides and what would be implications for decision-making.

So this is not about preparing this beforehand and then presenting it, but about making it together with the farmers and as it is created, have discussions on implications, etc.

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Example 5.4: Pictures/visuals that may be used

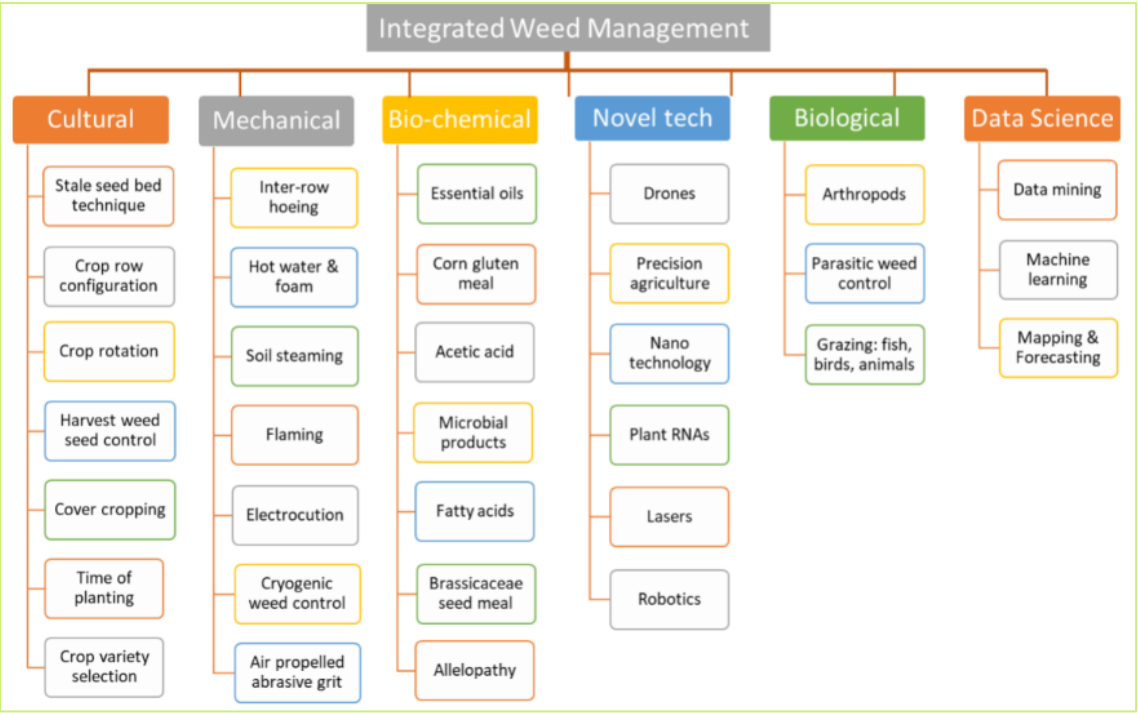
Purpose: A picture can say more than a thousand words. When explaining topics which require presenting overviews, as much as possible try to do so in a visual way.

Process: There are many ready-made visuals available on the internet that you may use. So if you cannot produce your own, consider using visuals such as the following examples.

Step 1: Explain the visual. Ideally, gradually build up the visual instead of showing all of it at the same time (if possible).

Step 2: Facilitate a discussion in relation to the visual.

The following are only examples to illustrate what type of visuals may be used.



Visual 1: Dimensions and options of integrated weed management. Source: https://rodaleinstitute.org/wp-content/uploads/Screenshot-2022-07-07-153402-e1657222552368-768x402.png

Visual 2: Soil types and depths of different plants. Source: Cornell College of Agriculture and Life Sciences

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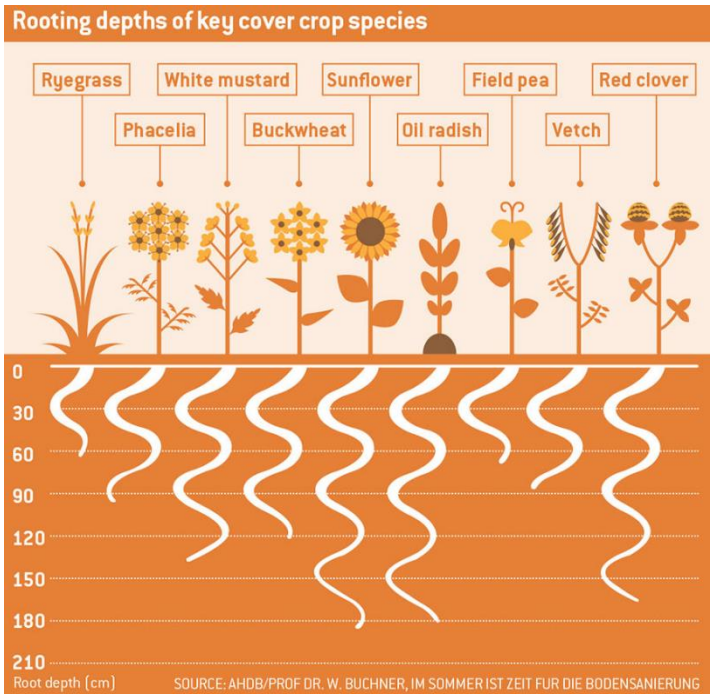
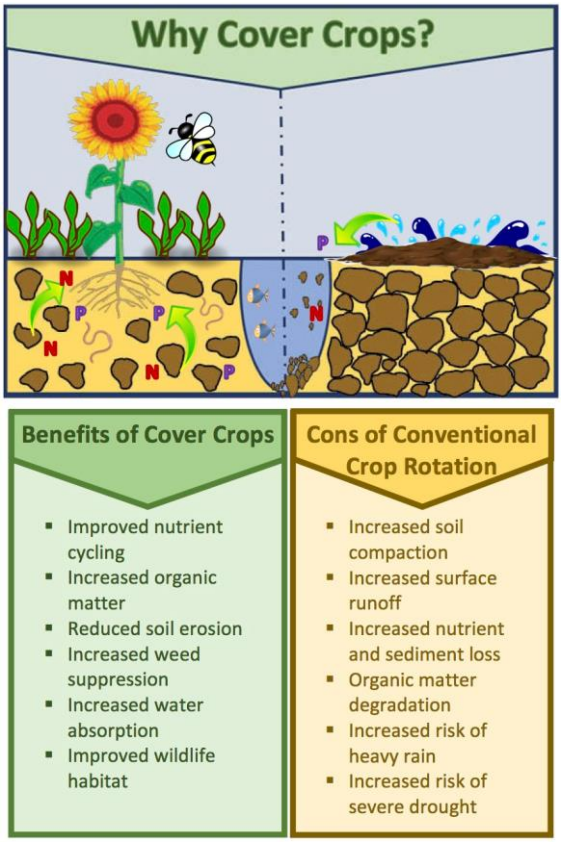


Visual 3: Similar visual as visual 2, but now presented in a more schematic way. Source: https://stmaaprodfwsite.blob.core.windows.net/assets/sites/1/Cover-crop-rooting-depths-wp-crop.jpg



Visual 4: The use of cover crops. Source: https://fyi.extension.wisc.edu/foxdemofarms/files/2017/01/Why-Cover-Crops_v4.jpg

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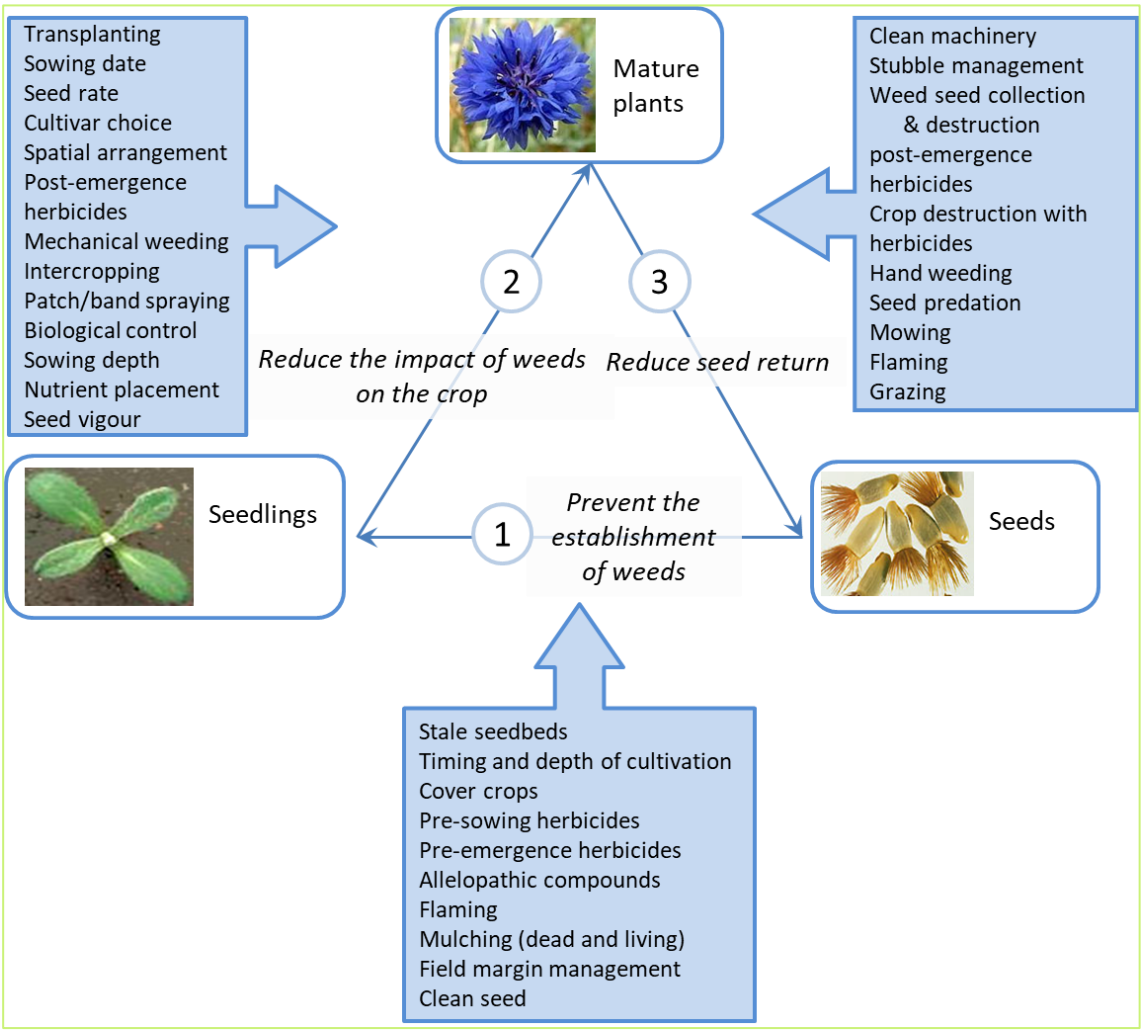

Visual 5: Weed management processes. Source: https://management-club.com/en/c6/governance-management/weed-management-control-methods.php

Example 5.5: Acquainting hub members with elements of the IPM Pyramid

Purpose: Making farmers acquainted with the principles underpinning the IPM Pyramid. This may especially be useful earlier on in the demo hub, depending on how much farmers are already acquainted with this.

Process:

1. Make small groups of 3-4 farmers.
2. Each group has 7 cards. Each card has a different IPM method / technique printed on it.
3. Ask them to place the cards in order from 1 to 7, as shown on pyramid.

   #1 is the most basic, fundamental method

   #7 is the least used method

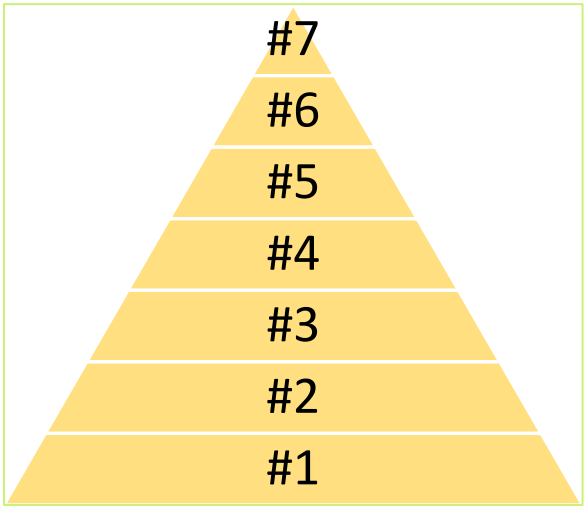

Fig.17. Getting acquainted with the IPM Pyramid. Adapted from Vaughn 2019b.

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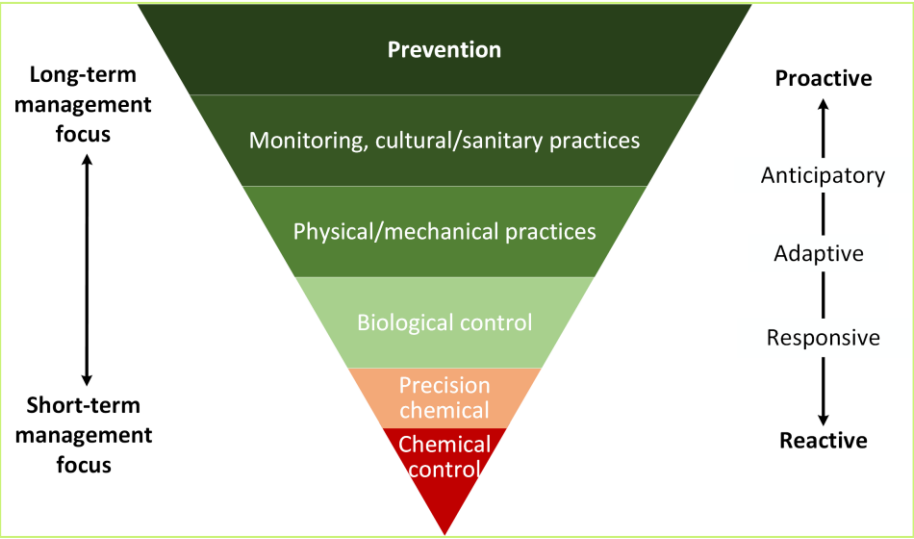
Example 5.6: Implications of the order of elements of the IPM pyramid

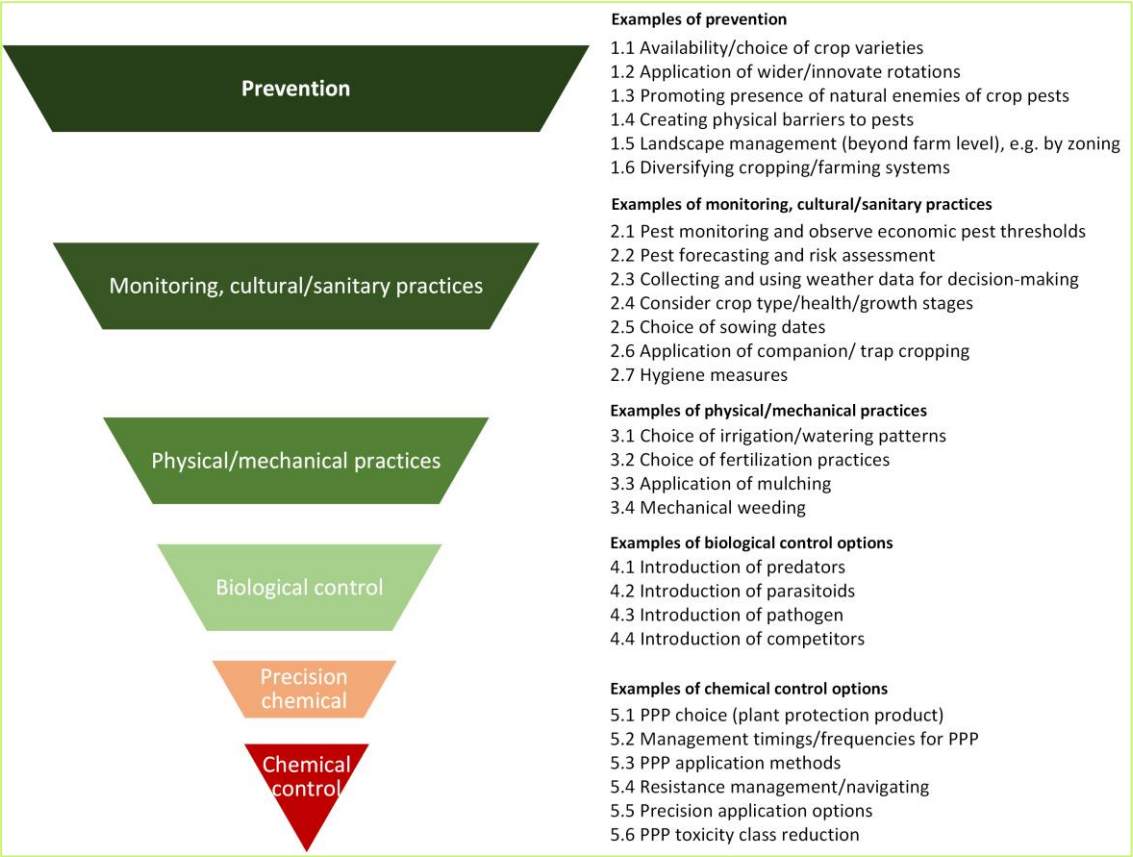
Purpose: Using the (inverted) IPM pyramid for reflection. The poster may also be put up from time to time just as a reminder of key elements of IPM or in combination with the holistic IPM visual.

Process:

1. Explain the poster.
2. Possible guiding questions for discussion: What have we focused on as demo hub over the past year? Or, what is the focus of how you engage with IPM on your farm? Or, how do we see these dimensions represented in the past demo event? Etc.



The IPM pyramid may also be shown with a range of options next to it:



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5.6. Ways to facilitate learning about and reflection on holistic IPM

We close this chapter with an overview of inspirational ideas for facilitating interactions specifically related to the five pillars of holistic IPM as presented in section 2.2.1. This is partly based on input provided by hub coaches and other IPMWORKS partners during an annual meeting in 2023. Some of the descriptions are very short and included only for inspiration.

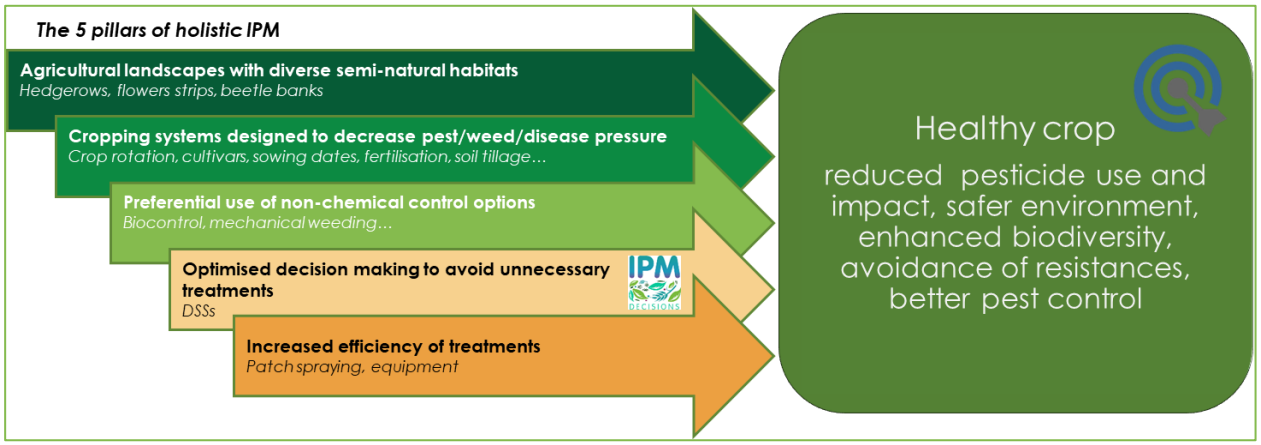

Fig.18. The holistic IPM approach proposed by IPMWORKS

5.6.1. Examples of facilitation methods and tools in relation to pillar 1 – agricultural landscapes

Pillar 1: Agricultural landscapes with diverse semi-natural habitats designed to manage pests, weeds and diseases, e.g. through spatial diversity in terms of landscape features such as hedgerows, grass and flower strips and other semi-natural habitats favouring beneficial biodiversity.

Example ideas:

- Do a transect (landscape) walk together, not just a farm walk, and discuss in the form of what may be called participatory monitoring of habitats/landscape features and how they relate to crops and cropping systems.
- Landscape reading - https://readinglandscape.org/. There is a documentary that may be watched together during the winter season to provide inspiration on landscapes, landscape management, and how related principles are relevant for agriculture.
- Organise a workshop on hedgerow design to help farmers with correct designs for hedgerow/flower strips. Connect to a guid such as, e.g., https://www.hedgelink.org.uk/cms/cms_content/files/89_hedgerow-survey-handbook.pdf

Example methods:

- Engage farmers in landscape design on a (computer-based) map using low tech 3D (threedimensional) tools . Or, provide paper maps (e.g. 1:10000 or even more detailed) with information (resource, or land use, or property). Add crops/habitats as extra layer. Facilitate a brainstorm about ecological infrastructure. 3D landscaping software is available in different forms and with different price tags. For an example, see https://www.vectorworks.net/en-US/landmark.
- Find a farm which has a good range of natural habitats, e.g. wide crop rotations, flower margins, intercropping/companion crops. Ideally with a few examples close together so easy to demonstrate. Show/discuss what benefit the landscape has had on crop management. E.g. trap 10 insects and count # of predators vs. pests; reduced disease or weeds in intercropping, then assess and present details. Also relates to pillar 2.

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5.6.2. Examples of facilitation methods and tools in relation to pillar 2 – cropping systems

Pillar 2: Cropping systems designed to manage pests, weeds and diseases, e.g. through diversified crop rotations, cultivars resistant to diseases, intercropping, sowing dates adapted to escape pests, moderate fertilization, crop mixtures, and other practices.

Example ideas:

- Field walks in a more or a less systematic way, often with the farmer explaining about what is there to see, experiences she/he has had, etc., to get a good impression of field/crop realities which stimulates meaningful exchange of ideas. You will have very different types of conversations as you walk together and discuss things, than when sitting inside together at a table.
- A specific version of the above: Farmer-led walks combined with information stations: "Let farmers be hosted by someone who is living the story, not by someone (advisor or other) who may be selling the story".
- Provide overviews of what happens in the year in relation to a particular cropping system. So not only focus on what is observable at one point in time.

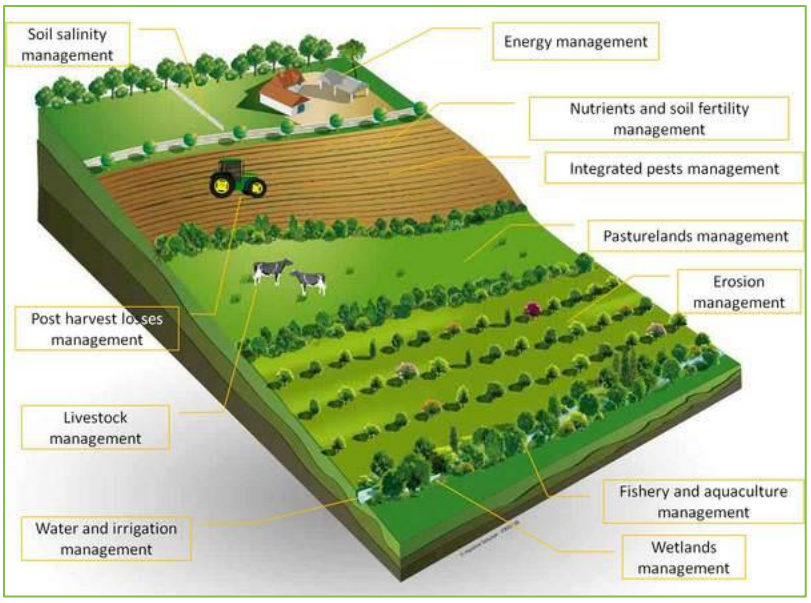

Fig. 19. Farm overview. Source: https://www.pmfias.com/wp-content/uploads/2019/09/image1-3.jpeg

Example methods:

- Create a visual overview of the farm with short descriptions relevant for IPM. Like Figure 19, but it can be simpler too, of course. It may also be limited to one particular field.
- Posters can also be used to describe the cropping system combined with a graph of costs and yields. This may include field comparisons that enable showing differences in related input/labour needs.
- Show a whole system setup. E.g., in a particular demo hub, this was done in relation to sweet potato cultivation. Visitors were explained the steps of development for crops. i.e. 1) seed arrives and put into seed tunnel/nursery → seed collection and planting, etc. The use of diagrams is advised to make it easier to explain processes.
- A system (re-)design workshop, which can be done in a more formal and elaborate way (e.g. see Jeuffroy et al. 2022; Leclère et al. 2021), or in a more informal way (which does require sufficient levels of trust and mutual kindness in the group), such as follows: Ideally after having done an elaborate farm walk, the hosting farmer presents his cropping system and the main problems he met. Then all the other farmers start a brain-storm session and make suggestions for ways in which the cropping system might be re-designed so that it would reduced reliance on pesticide while sustaining crop health. The hosting farmer is not allowed to speak, unless he is questionned on a specific question the others need to know. The hub coach is in charge of representing the re-

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designed cropping system on a whiteboard. Then the hosting farmer is invited to react and provide feedbacks about the suggestions, and express his/her thoughts on what is and isn't something he/she would consider applying and why.

Participatory modelling is also a way of facilitating a group of farmers to think through system connections (more on this in Gouttenoire et al. 2013).

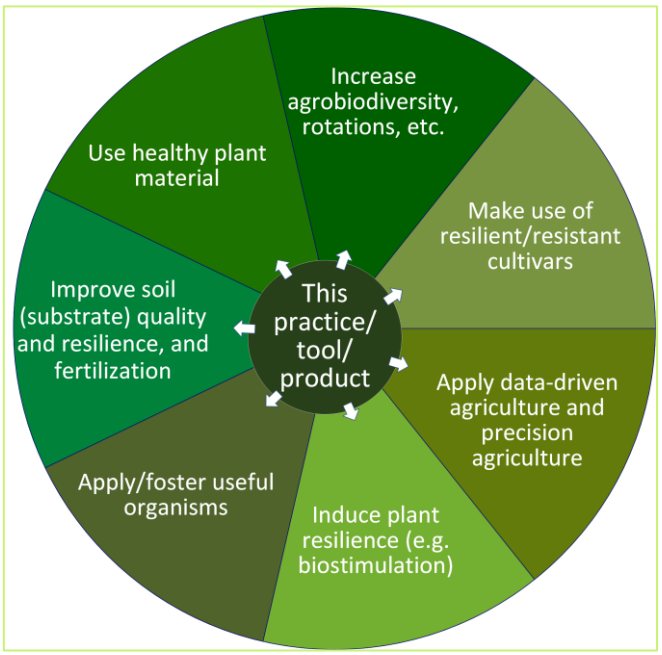

Fig. 20. Discussing a particular practice, or an entire cropping system from relevant angles related to IPM.

- Another method which also requires high levels of trust and mutual kindness is to do a benchmarking workshop : The hub coach presents data comparing the different cropping systems of the hub members (main technical options), and their outcomes (PPP use, input costs, yields, margins), and discuss with the farmers about the reasons for differences. This does require significant preparation to be able to present appropriate data.
- A hub coach may opt for a variation on the system (re)design workshop or benchmarking workshop to e.g. make it less sensitive while still helping to think through system (re) design rather than being focused on separate practices. One example of such variation can be found here: https://ourlandandwater.nz/news/seeing-the-big-picture/
- Discussing an option in light of a wider resilient cropping system perspective (Figure 20).

Purpose: Considering a particular practice or product as part of a wider resilient cropping system approach.

Process: Guiding question (example): How does this practice/tool connect to a wider resilient cropping system's strategy? What could/should it be complemented by?

- The IWMPRAISE project (https://iwmpraise.eu/) developed a serious game in relation to weed management (Figure 21). Since it takes a bit more time to do, it may be particularly suitable for the winter season when there is less work to do on the farm.

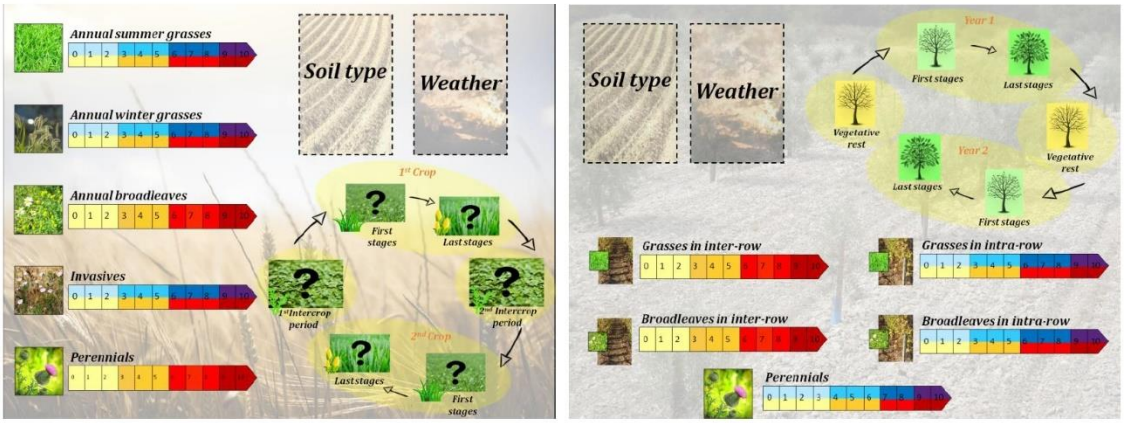

Fig. 21. The IWM game for perennial crops

Two versions are available for each game, in French and in English. You can access them here: https://iwmpraise.eu/iwm-game-for-perennial-crops. To get more ideas on the way in which

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serious games may be used, see Meunier et al. 2022, Moojen et al. 2022, and https://www.remix-intercrops.eu/news/interplay-serious-game-released

5.6.3. Examples of facilitation methods and tools in relation to pillar 3 – non-chemical options

Pillar 3: **Preferential use of non-chemical control options, e.g., mechanical weeding (and eventually robotics), release of biocontrol organisms and agents, mating disruption, protective nets, and other non-chemical methods.**

Example ideas:

- Demonstrations of (e.g. mechanical weeding) machinery. Show the machine and explain it, but also show it in the field working on a regular day to really see the potential of it and how to use it properly. Facilitate a discussion of the pros and cons of the demonstrated machinery.
- Create a way of demonstrating how beneficial insects do their work in relation to harmful insects or other benefits, such as how bumble bees help in pollination. In a greenhouse this will be easier to do. A small controlled experiment may also be set up so that it is possible to see real life action of the beneficial insects.
- Provide magnifying glasses to participating farmers in a demonstration to observe/identify beneficial insects and pests to better understand either what they are up against, or who are their allies. Help to recognize and distinguish between natural enemies and pests on plants – show/explain dynamics.
- Use information panels and/or pictures with basic information that relates to plant species and/or and beneficial insects.
- Share (about) identification apps or booklets so that participants can also identify beneficial organisms in the future. Show how to use it.
- Monitoring by means of insect trap – ask to identify 3 pests, provide folder with picture. Monitor in the field with experts with direct result. Farmer compares own results with that of the experts.

5.6.4. Examples of methods and tools in relation to pillar 4 – decision support

Pillar 4: Optimized decision making guiding operational and strategic IPM choices, e.g. precise monitoring and IPM Decision Support Systems (DSS) to avoid unnecessary treatments, and periodic evaluation of IPM strategies to continually fine-tune and improve context-specific approaches.

Example ideas:

- In relation to a particular demonstration or experiment, ask farmers to form their opinion about what is going on and what should be done. Compare impression of farmers (so ask them to share), and the available data. Discuss differences, if possible with specialists present.
- A Whatsapp group with other farmers can be also used to help share pictures and interactively identify pests, diseases, and other relevant situations. They can discuss what would be appropriate strategies. In this way, it can be part of peer-to-peer learning. In this way, farmers can support each other in decision-making.
- Provide calendar overviews such as shown in Figure 22 and discuss implications for IPM decision-making.
- Providing DSS (e.g. farmmaps) for reducing input and optimizing efficacy and let farmers test it.
- Bring data of the last crop and analyse the data with DSS together with an expert.
- Guide farmers in adjusting the pesticide treatment throughout the growth season to adjust to real need instead of applying calendar treatment. Discuss at the end of the season how this worked out and what the learnt from this.

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- Set a DSS alarm to go into the field and check threshold. Discuss with the group about thresholds and different possible decisions.

The IPM Decisions Platform now has 27 different Decisions Support Systems, helping you forecast risk for your specific location for a range of different diseases and invertebrate pests of orchard, arable and horticultural crops. Fact sheets, available via the Toolbox, have been created to accompany these DSS to help you get the greatest insight from their output: https://www.platform.ipmdecisions.net/ and https://www.ipmdecisions.net/the-platform/available-dss/

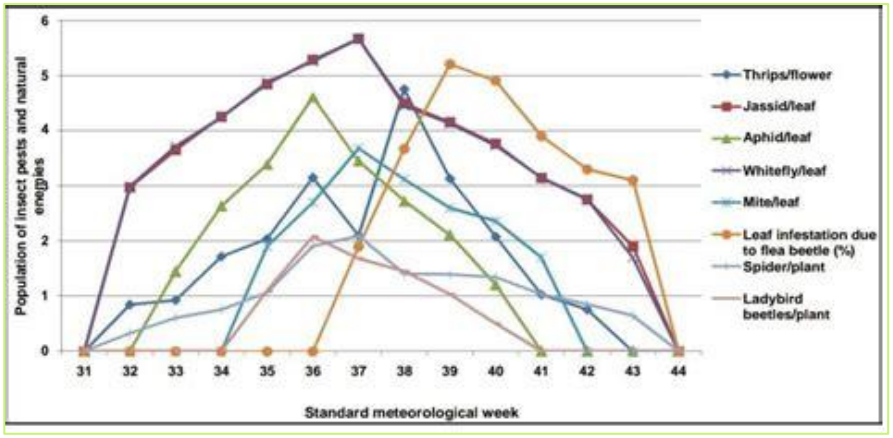

Fig. 22. Illustration of pests development over time. Source: public.s3.amazonaws.com/figures/2017-08-https://ai2-s2-08/2049254db684f991eb0eadaf0149dc923026300b/4-Figure1-1.png

Example methods:

- Helping farmers to make better decisions on when to spray and when it is not needed. Show the nontreatment control, which diseases are present on leaves. Show the treatment for comparison between control and treatment. Present weather data before and after spraying. Look at differences. Together evaluate the efficiencies. Specialists can also evaluate, and then thoughts can be exchanged.
- Discussing effectiveness and feasibility of options

Purpose: If a diagram such as Figure 23 is used more often, gradually a better idea is formed in terms of how different options/practices/tools compare in terms of their effectiveness and feasibility.

Process: Such discussion may be done without canvas as well, of course, but a canvas may help to engage farmers more e.g. by posting post-its on the canvas. Guiding question (example): How does this specific practice/method/product compare to other available options?

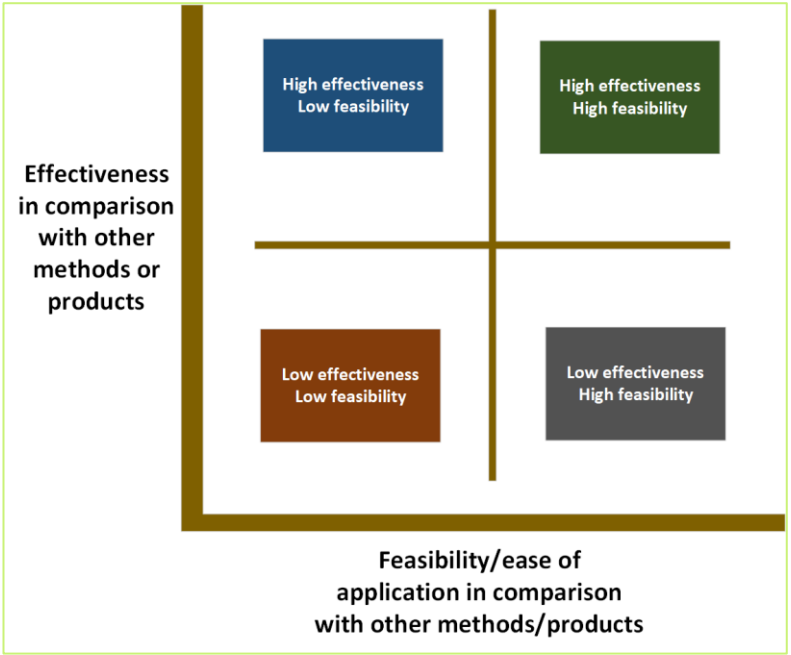

Fig. 23. Discussing a particular practice/ tool in terms of its feasibility and effectiveness.

- Discussing enabling and disabling conditions related to a particular practice or product

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Purpose: Discussing barriers and enabling conditions for a particular practice or product. Guiding question (example): see Figure 24.

Process:

1. Explain on the basis of the first circle what barriers/disabling factors may be about.
2. Then take a particular option (as demonstrated, or discussed in general) and then discuss where it stands in terms of the six potential barriers. Of course a different type of illustration (does not have to be a circle) can be used for this as well.

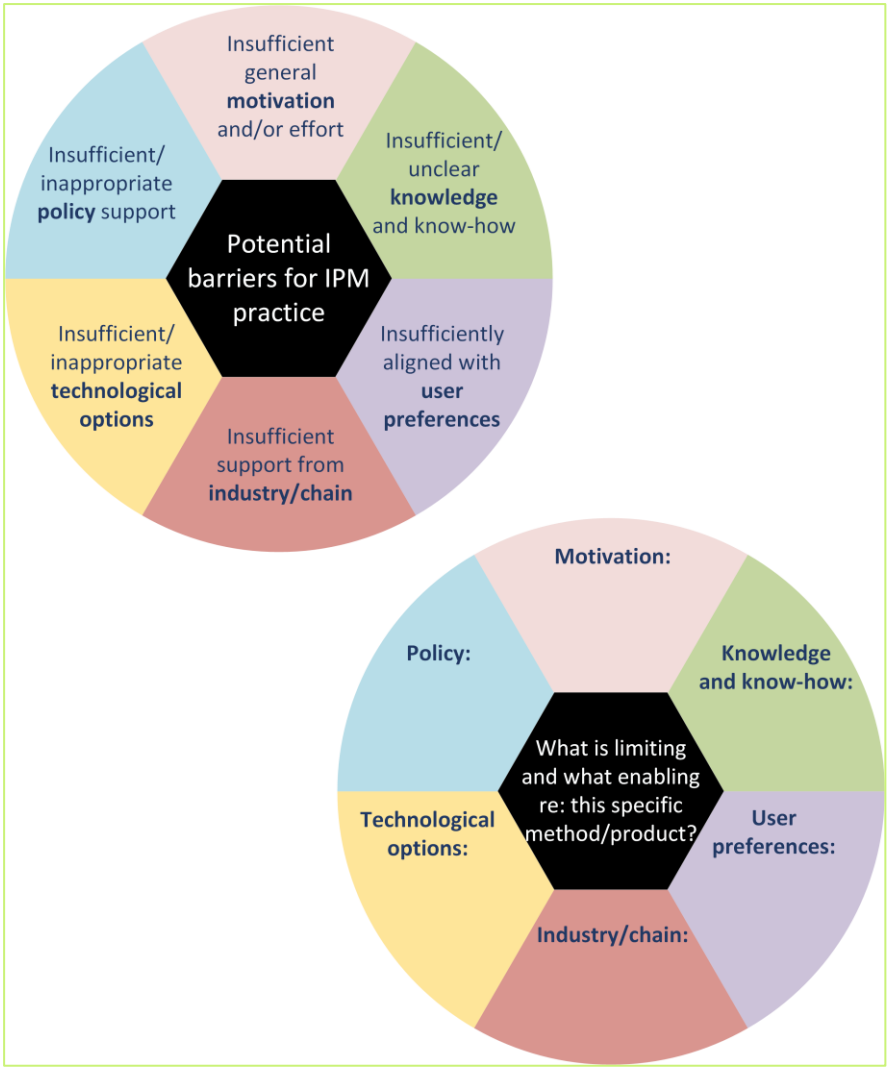

Fig. 24. Considering enabling and disabling factors that influence choices in relation to specific methods/products

5.6.5. Examples of methods and tools in relation to pillar 5 – increased efficiency treatments

Pillar 5: Increased efficiency of treatments, e.g. through technologies for precision and patch spraying.

Example ideas:

- Machinery (for applying treatments) demonstration. Different machines demonstrated. A poster used to show where and the order of each of the demonstrations and the efficacy explained for each of the options. At the end, have a group discussion on the pros and cons of each machine.

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- Set up a trial with different treatments (levels) with chemicals against late blight or something else. Visit these fields with farmers. First let farmers figure out which treatment belonged to which plot in the field. Afterwards, further discuss based on the actual treatment-plot combination. This helps to connect expectations to results (reality).
- Dig up potatoes to do a visual yield assessment in relation to different treatments. This supports connecting crop protection strategy to economic/yield impact.
- Organize a demonstration on herbicide treatments in different dosage (max. and min.) to compare the efficacy. E.g. in winter wheat at 2 sowing dates, early and late. So this is about grassweed protection. Other variation can be thought about in terms of comparing different treatments.
- Train farmers to dissect wheat plants to identify when leaf 3 is fully emerged. This helps to improve the first fungicide application (timing) on winter wheat.
- Set up demonstration on application techniques. Focus on nozzle type and application efficiency. Always good to have a machine to attract farmers. You may use blotting paper to show the spray pattern from the different nozzles. This helped to ensure better chemical application efficiency.
- Create a treatment frequency graph or infographic on pesticide use on a particular farm (if the farmer is open to share such information). See Figure 25 and Figure 26 for examples.
- Show timeline of pest/natural enemy incidence (see Figure 22) so farmers get a feel for dynamics. Explain the system and seasonality, and how it could influence their decision making to implement IPM measures. Compare to timeline of spraying – when could spraying be less effective. Discuss the difference between calendar spraying vs. using DSS to decide when to spray.

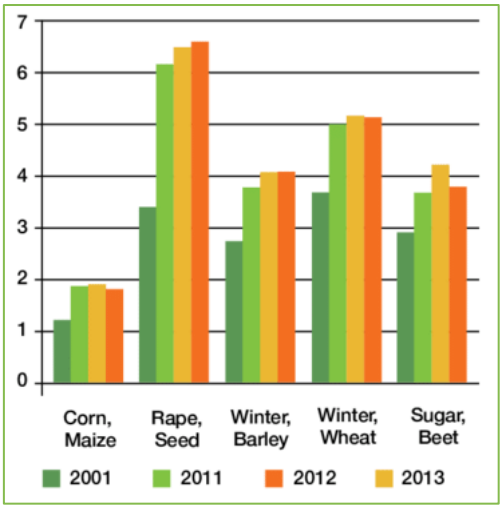

Fig. 25. Treatment frequencies per crop over the years.

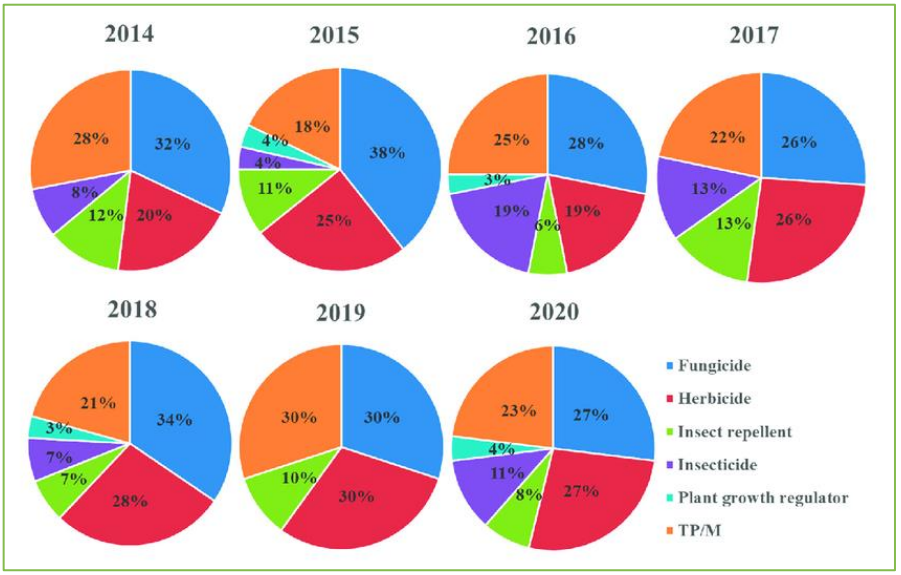

Fig. 26. Visualising changes in application of pesticides and growth regulators of the years.

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Further reading and references

We presented a number of methods and tools from the EU Horizon 2020 Nefertiti project. Many of these tools and methods are available in a range of European languages. In the following web location you can find general guidance:

https://trainingkit.farmdemo.eu/ https://mspguide.org/

https://edepot.wur.nl/439461 https://www.liberatingstructures.com/

https://seedsforchange.org.uk/tools.pdf https://www.sessionlab.com/library

Design guide for on-farm demonstrations: https://trainingkit.farmdemo.eu/demo-design-guide/

Triste, L. (2021) Guidelines for conclusion at a demo event. NEFERTITI/FarmDemo. trainingkit.farmdemo.eu

A useful guidebook on Reflection Methods can be downloaded for free here: https://edepot.wur.nl/439461. Just going through it diagonally may give you some useful ideas besides what follows in this chapter.

During the 1980s, 1990s and early 2000s, interactive assessments called Rapid Rural Appraisal and later Participatory Rural Appraisal were widely applied in the Global South. The Farmer Participatory Research approach built on this in relation to e.g. on-farm trials. The Multi-Stakeholder Approach that came up later borrows much from that earlier movement that aimed to work in more participatory and interactive ways with communities in general and farmers specifically (since many of them are farmers).

It is a pity that much of this work has been forgotten and fallen into oblivion. Here, you can still access the wealth of hands-on methods that were developed during this time: https://www.iied.org/collection/participatory-learning-action and https://www.iied.org/participatory-learning-action-archive. The following book provides an overview of many of these methods: https://www.iied.org/sites/default/files/pdfs/migrate/6021IIED.pdf Even if this is too much for you, it may be helpful to just glance through these materials, or just the book in 15-20 minutes to get a feel of what may be considered as the origins of participatory approaches to extension and advisory services.

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6. Conclusion

In the context of Integrated Pest Management (IPM) demonstration hubs, the interplay between technical knowledge, social skills, and robust facilitation techniques is crucial for advancing sustainable agricultural practices. The IPMWORKS project exemplifies how these hubs serve not only as centres for learning about pest management strategies but also as platforms for enhancing interpersonal interactions and building community among farmers, advisors, and stakeholders. This comprehensive approach underscores the need for educational materials that cultivate both individual competencies and collective capabilities within these hubs.

The effectiveness of the holistic IPM approach is significantly enhanced by addressing performance areas that focus on the human and community aspects of farming.

The combination of these two dimensions—holistic IPM and social performance areas—forms a robust framework for IPM demonstration hubs. This framework facilitates an effective interaction between content (IPM strategies) and process (learning and community engagement), which is crucial for the success of IPM initiatives.

Overall, the IPMWORKS approach illustrates the value of a coherent strategy that not only addresses the technical aspects of pest management but also deeply integrates the social skills and community dynamics essential for sustainable farming. This comprehensive approach ensures that IPM practices are not only about managing pests efficiently but also about building resilient farming communities capable of adapting to new challenges and innovations in agriculture.

Enhancing Individual Social Competencies

The success of IPM demo hubs largely depends on the social competencies of the individuals involved. These competencies include effective communication, leadership, and conflict resolution skills that enable participants to share knowledge, negotiate solutions, and maintain mutual respect among diverse groups. Effective communication is fundamental, ensuring that complex IPM strategies are clearly understood and correctly implemented.

Conflict management is another critical area, as the varied interests and backgrounds of hub participants can lead to disputes. Training in this area can help to equip participants with the effective approaches for handling disagreements constructively, preventing them from stalling collective progress. Additionally, leadership and facilitation skills are essential for guiding discussions, making inclusive decisions, and motivating group members toward shared goals. Role-playing exercises and workshops can significantly enhance these skills by providing practical frameworks and scenarios that mimic real-life challenges.

Building Collective Capabilities through Facilitation

Beyond individual skills, the strength of a demonstration hub lies in its collective capabilities, which are enhanced through structured facilitation methods, processes, and tools. These facilitation elements are designed to foster a community of practice where learning and responsibility are shared, and the collective intelligence of the group is harnessed to tackle IPM challenges effectively. IPM involves principles that need to be applied in different ways to connect appropriately to different (ecological, economic, social, etc.) contexts. This involves tailor-making options and such interactive learning processes are crucial for making appropriate connections and translating general theory into contextualised practice.

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Team building is crucial for fostering sustained collaboration. Learning materials and activities should focus on improving team dynamics, role allocation, and trust-building among members. Collaborative problem-solving workshops that utilize facilitation methods and tools encourage the development of creative applications of and innovative approaches to IPM. Moreover, well-facilitated discussions and other interactions ensure that all voices are heard and that outcomes reflect the community's collective wisdom.

Creating an Enabling Learning Environment

The effectiveness of integrating social skills and facilitation techniques in IPM hubs is also contingent on the existence of an enabling learning environment. Part of this can be catered through by the hub coach and those supporting her/him from the organisation they represent, e.g. through subject specialists. However, not all of this lies within the sphere of control of the hub coach nor of the organisation they represent. This means that facilitation is also about helping hub members navigate complexities which stem from policies, regulations, and other external factors.

Key messages

The essential message of this report is that social skills are of critical importance for and at the heart of success in demo hubs and it illustrates in a variety of ways what this means. This is very relevant for farmer demonstration hubs/networks in general as well as those focusing specifically on IPM because the tendency is to focus on content expertise, paying less attention to the critical role of social interaction processes, including peer-to-peer learning and exchange.

Another important message from this report is that social skills in IPM demo hubs are not just about all kinds of social interaction methods and tools. Much if not most of the efficacy of facilitation is determined by basic dispositions, people skills, and general organizational skills. This is good news for hub coaches who have not had much training in facilitation methods and tools. It means that with some additional upgrade of their knowledge and experience in the field of facilitating interactive processes, they can become expert hub facilitators in a relatively short time. In a fitting metaphor: if the roots are good, the rest will follow.

A third key message is that social skills are not about applying a fixed method, but rather about applying certain principles such as related to adult learning and situational leadership, and adapt those to fit specific contexts and conditions. It includes a need for developing one’s own style of interacting with hub members and choice of methods, tools, and processes. Not everything can be prepared beforehand anyway, and there will be surprises and awkward situations.

Conclusion and Recommendations

The strategic integration of social skills and competencies through well-structured facilitation methods within IPM demonstration hubs is essential for seeing the application of sustainable pest management strategies becoming more and more common. This multifaceted approach not only enhances the technical proficiency of participants but also strengthens the overall social fabric of the agricultural communities involved. Through these concerted efforts, IPM demonstration hubs can significantly improve conditions for a wider spreading application and efficacy of pest management strategies, fostering more resilient and sustainable agricultural practices.

This deliverable aims to solidify the foundations laid by the IPMWORKS project, and by doing so promote a more sustainable and resilient future for agriculture and farmers across Europe.

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Annex 1. Planning for demo hub meetings and events

The following provides further ideas on what is involved in good planning for demo hub meetings and events.

1. Preparing for and facilitating meetings

The following is adapted from the IPMWORKS 'design your own meeting' template.

Goal

Write down the goal of the meeting, sometimes it is useful to ad sub goals. You can have multiple goals in one meeting, make them specific. Ask yourself the question why you are organizing this meeting.

Result

The desired results of the meeting are:

Participants and role:

Write a few lines questions to get and give a better view on the people involved and their roles.

Who is participating? Why are they involved in this meeting? Do they have specific roles or tasks in the meeting or in the project? What is the minimum you expect from participants? Can you reach the goals with this group?

Inviting

Think about how to invite to get the desired people in the meeting. Why is it relevant for them? Use the information from goals and results. There is difference in an invitation via an e-mail, phone call or one to one meeting!

Preparation

Here you list the items that have to be dealt with before the meeting, think of:

1. Reservation of the room(s) (is the room suitable for the meeting you want to organise), think of drinks, atmosphere, temperature and fresh air
2. Support technologies: Flipcharts, whiteboards, projectors, laptops
3. An email to participants with preparation questions which helps in the process of the meeting
4. Practical information for participants
5. Location & how to travel; a Concept agenda
6. If people have a specific tasks (f.e. a presentation) tell them about your expectations and time available for presentation and discussion
7. Make actions specific with a deadline and a dedicated person (name)

Make a detailed script for the actual meeting: Choose your methods in connection to goal/participants/result/ time/importance

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Summarising the resulting plan

The following is an example of how you may create a systematic overview of how the plan will be implemented.

Time	Section and goal	Methods and materials	Who is responsible
	Describe what you are going to do. *Below describe the goal of this part of the programme*	Describe the process methods and/or materials you are going to use, considering the goal and expected behaviour of participants	Make people (including yourself) responsible for parts of the meeting and for reporting. This can also be participants
12.30	Arranging the room, flip-chats, light, beamer *Goal: The room and the facilities are ready before the participant arrive*	Which setting of the room makes the needed interaction most effective? *Room setting plenary U-shape, beamer, screen, laptop, flipchart, markers. Room setting group work table and chairs for 6, flipchart, markers, ...*	
13.00	Always be on time as facilitator and host *Goal: a warm welcome for the participants*		
13.15	Participants are arriving *Goal: People do have time to settle in the meeting* *Workshop can start in time*	Coffee/Tea/cake .. on the table	
13.30	Welcome *Goal: Importance of meeting is drafted*		
	Introduction on programme and participants *Goals and programme are clear for participants.* *Participants learn about each other*	Programme and goal on sheet or flipchart Are participants familiar to each other? You could make a round with an introduction question so they can link their personal situation/ambition to the goal of the meeting A more energizer method to get to know each other could work	

2. Examples of programmes of hub meetings

Source: Simon Lox, personal communication

10.08.2022

8. Asking the hosting farmer what the main information he/she wants to get out of the group.
9. Flipchart with crop cultivation scheme (timeline) printed on it to structure and visualise the

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testimony of the farmers in time.

10. Flexibility in planning if the interest is going to different topics as planned.
11. Assuring confidentiality by stating that some information is confidential.
12. Exhibition displaying pest, traps, information folders, prints with zooms, etc.
13. Explain lifecycle of the pest and how it damages the crop.
14. Giving an overview of all possible practices that can be included in a strategy against a pest.
15. Asking to prepare and bring something of their farm, ex putting up a trap and bringing it to examine it during the demo.
16. Demonstrating and explaining how to recognise a pest on an actual sample of pests. Also letting the farmers try and practice how to recognise pests.
17. Hand out samples and brochures that farmers can take home.

20.01.2023

18. Making an 'exhibition' of folders, flyers and report and actively stating to the farmers which folders might be interesting for them.
19. Presenting a timeline with past activities, to show what has been done, what could be learnt, showing a certain flow.
20. Comparing data from two different contexts and discussing why there are differences and similarities.
21. Showing data on pest monitoring and discussing which practices have been used and which could be used or which are used by others.
22. Comparing spraying schemes.
23. Making hand-outs with data and information.
24. Using Mentimeter or other digital tool to ask some questions, present them by projecting them use the results to open a discussion.
25. Explaining the purpose and expectations of the hub and the project.
26. Asking to put ideas on a specific question on post-its for a minute and then sharing these ideas, noting things on a flip-chart and putting the post-its (with name) on the flip-chart.
27. Splitting big groups into smaller groups.
28. Asking for their experiences and interests.
29. Summarizing and concluding and presenting a follow-up planning.
30. Creating platform to talk to other stakeholders.
31. Pointing to opportunities.

30.06.2023

32. Introducing the purpose, preparing the visitors that they will have to think and share their opinion.
33. Posters with different options and all visitors have coloured dot stickers that they have to put on one of the options on the poster. Discuss the general outcome, ask some people why they chose for a certain option.
34. Refer to previous demo's.
35. Explain what happened in the demo and what the purpose was.
36. Be honest when something didn't work.
37. Hand-outs with information on the demo and results of trials.
38. Samples to taste and compare different varieties.
39. Let the group divide spatially: one camp is for one option, the other camp for another option.
40. What if scenarios. What if you would do this, what would the problem be expected.
41. Use videos to demonstrate the things that cannot be observed any more.
42. Use samples to touch and feel.

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Annex 2. Example of exit poll template

Example of farm demo exit poll setup as used in many of the IPMWORKS demo hubs

Farm Demo Exit Poll

Please fill this out to help us learn

1. I am a ....

- ☐ *Farmer*
- ☐ *Farm employee*
- ☐ *Public or private adviser*
- ☐ *Supply chain actor*
- ☐ *Consumer*
- ☐ *Researcher*
- ☐ *Student*
- ☐ *Policy maker*
- ☐ Other (Please specify) _____

2. Gender

- ☐ M
- ☐ F
- ☐ X

3. I found out about the event through ....

- ☐ Personal invitation
- ☐ Mailing list
- ☐ Social media
- ☐ Newspaper
- ☐ Radio
- ☐ TV
- ☐ Leaflet and poster
- ☐ SMS
- ☐ Other (Please specify) _____

4. I am here today because I ...

- ☐ was just curious in general
- ☐ wanted to meet other farmers to be able to discuss things with and hear from them
- ☐ wanted to learn more about IPM in general
- ☐ had specific questions on IPM that I wanted to get answers to
- ☐ was interested in a specific demonstration that I knew would be shown
- ☐ Other (Please specify) _____

5. The most useful thing I learnt today was...

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6. The following is what I thought about the demonstrations

Technique/ Practice Demonstrated **[Hub coach, please insert below]**	**Method used** **[Hub coach, please insert below]**	**0**: I did not see this demo	**A:** I did not find this interesting/ useful	**B:** I found this interesting but still have some questions/ need time for reflection	**C:** I now understand this practice and intend to apply this/ would apply this if I had opportunity	**D:** I am already applying this practice
[Eg mechanical weed control]	[E.g. Equipment/ machinery demonstration					
[Eg mesh netting of trees]	[E.g. Oral presentation]					
[Eg variety comparison]	[E.g. Farm/ field walks]					
[Eg providing habitats for natural enemies]	[E.g. On-line tutorial]					
.....						
.....						

Please note that the descriptions in the first two columns need to be adapted to the specific demo

7. I can see how different practices demonstrated today could be linked together into a coherent crop protection strategy

- ☐ Yes
- ☐ No
- ☐ Partially
- ☐ Only one practice was demonstrated
- ☐ Comments _____

8. I think the demonstration event was...

- ☐ Not well run
- ☐ Okay run
- ☐ Quite well run
- ☐ Very well run

9. I think this event could have been better if there had been ....

- ☐ Better logistics/planning
- ☐ More time for discussion/asking questions
- ☐ More time for informal interaction
- ☐ A more compact programme (less time and/or fewer demos)
- ☐ More interesting choice of demonstrations
- ☐ Other (Please specify) _____

10. In future demo events on plant health management options and strategies, I would like to learn more about ...

Thank you - we appreciate your feedback!

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