AGRIDEMO

D3.3 Key structural characteristics

&

D4.3 Key functional characteristics leading to effective outcomes

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Content

1 Introduction

1.1 The role of on-farm demonstrations

For agriculture to meet the multiple expectations emerging from society and contribute to tackling the challenges of food security, food safety, quality, sustainability and climate change in Europe, farming systems have to become more knowledge-based. Farmers need to be aware of, have access to, and be able to co-create the best practices available. Farmers and small scale foresters tend to be most influenced by proof of successful farming methods by their peers (Kilpatrick and Johns, 2003; Warner, 2007; Schneider *et al.*, 2009; Hamunen *et al.*, 2015). Demonstration farms can thus play a major role in the application of scientific findings (science driven research) and the spreading of best practices and innovative farming approaches (innovation driven research)[1] within the farming community. Developing effective peer-to-peer learning processes is seen as an important strategy to enable policy to support farming systems and facilitate their transition (Iles and Marsh, 2012). Furthermore, an increased understanding of such learning processes will help to develop institutions and programmes that can foster innovation dissemination and learning for sustainable practices (Lankester, 2013).

Farmers operate in a complex knowledge landscape or AKIS, drawing in information simultaneously from many different channels (e.g. social media, advisors, regulators, supply chains). Demonstration farms are just one element of this landscape; they are not a substitute for other forms of information but are a valued dimension to farmers' knowledge systems, particularly as they help by intensifying interaction farmers have with other farmers. The overall aim of AgriDemo-F2F (H2020 funded n°728061) is to enhance peer-to-peer learning within the commercial farming community.

1.2 Objective of this report

This report aims to structure and define the relevant key characteristics that influence the effectiveness of an on-farm demonstration[2]. These key characteristics can support thoughtful decision making when designing and delivering on-farm demonstrations so that they are effective in terms of learning outcomes.

The key characteristics are identified using the analytical framework of Agridemo-F2F (Koutsouris et al. 2017), additional insights from literature, and a profound cross case study analysis carried out during the AgriDemo-F2F project. The latter is based on data collected and analysed from 35 cases within 12 European countries presented in 35 case study reports and 8 stakeholder workshop reports[3] . Key characteristics are further described according to their effectiveness with respect to the extent and the nature of learning, as reported by participants of specific on-farm demonstration events. These cases represent a diverse array of demonstration approaches and activities. The full methodology and the data validation steps undertaken during the cross case analysis are highlighted in the last chapter of this report.

[1] Science driven research (classical hierarchical flow from science to societal impact) vs. innovation driven research (empowerment of the potential innovators themselves, farmers and small business owners) reflect two main types of motivation for research (EU SCAR, 2012).

[2] Here we use the general term 'on farm demonstration' to refer to the design and delivery of all on farm demonstration activities.

[3] These represent 10 of 12 partner countries, since Belgium and The Netherlands, and Sweden and Denmark have jointly hosted their workshops. Workshops were also conducted in Ireland and Poland, but at a later date than initially planned. As a result, workshop reports were not included in this analysis.

2 Defining key characteristics for on-farm demonstration

In this section, the key characteristics are identified and defined based upon the AgriDemo-F2F analytical framework, findings from the case study reports and the workshop reports, and recommendations shared during the 5th general meeting in Nantes. These are supported with reference to the literature. In brief, we followed an iterative approach, where a long list of key characteristics, based on both literature and case study data was gradually refined and reduced, to derive a set of 35 key characteristics, associated with effective on-farm demonstrations. The results from the analysis was validated during a set of national workshops and during workshop sessions at the 5th General Meeting in Nantes. A full overview of the methodological steps followed to distil this list of key characteristics is given under 3. Methodology for determining potential key characteristics.

Key characteristics are grouped in 7 main categories: context, goal of the demo, host farm & logistics, demonstration set-up, recruitment, learning & facilitation methods and follow-up & evaluation. An overview of all key characteristics, and their division across the 7 main categories is presented in Figure 1. Context is considered as a distinct category, since this mainly includes elements that to a large extent fall beyond the (direct) control of the actors involved in on-farm demonstration, but which nevertheless can have significant impact on the way on-farm demonstrations are organised and designed. As a result, these are important elements to consider, even if unable to change or modify directly. Also, when looking at the overview of key characteristics, it is important to note that 'context' and 'goal of the demonstration' relate to the aforementioned broad understanding of on-farm demonstrations (i.e. including demonstration programmes, projects, series of demonstration events, and one-off demonstration events), while from 'host farm & logistics' onwards, key characteristics relate more specifically to the organisation of on-farm demonstration events. Results on effectiveness for these latter items is also mainly based on surveys collected from partcipants after attending a demonstration event.

Finally, some key characteristics are sometimes clearly referred to in the case study and workshop reports. If this is the case, we mention the number of those reports. It is important to note here that it is not because a key characteristic is not clearly mentioned in a case study report, that it is automatically not relevant or untrue for that case. It only means clear evidence for this key characteristic was not found during data collection activities in these case studies.

Key characteristics for on farm demonstrations

0. CONTEXT

- ✓ *Embedding within the regional AKIS*
- ✓ *Type of organizer*
- ✓ *Type of funders*
- ✓ *Decision-making on the demo objective, content and set-up*

1. GOAL OF THE DEMONSTRATION

- ✓ Targeted objectives
- ✓ Topic and diversity of topics
- ✓ Sustainability dimension(s)
- ✓ Degree, level, type of Innovation

2. HOST FARM & LOGISTICS

- ✓ Good access
- ✓ Suitable facilities
- ✓ Catering (Food & Drink)
- ✓ Registration
- ✓ Participants can relate to the farm

3. DEMONSTRATION SET-UP

- ✓ Group size
- ✓ Trustworthy demonstrator
- ✓ Role division
- ✓ Available time for the demo
- ✓ Available budget
- ✓ Scope of the demo
- ✓ Type of demonstration
- ✓ Composition of the group
- ✓ Group connectedness

4. RECRUITMENT

- ✓ Invitation adapted to the target audience
- ✓ Suitable period (timing & season)
- ✓ Publicity

5. LEARNING & FACILITATION METHODS

- ✓ Activities supporting (inter-)active knowledge exchange
- ✓ Activities supporting experiential learning
- ✓ Create stimulating setting
- ✓ Didactic materials
- ✓ Time management
- ✓ Plan vs. practice

6. FOLLOW-UP AND EVALUATION

- ✓ Planning
- ✓ Activities
- ✓ Materials
- ✓ Influence on next demo

Figure 1: overview of key characteristics

2.1 Context

2.1.1 Embedding of the demonstration

On-farm demonstrations are commissioned by a variety of actors within and outside AKIS; still actors and structural arrangements for coordinating and delivering demonstration activities sit within, and are not independent of, a wider advisory landscape and AKIS. Farmers, in particular, operate in a complex knowledge landscape or AKIS, drawing in information simultaneously from many different channels (e.g. social media, advisers, regulator, supply chains). The literature points out that working with pre-existing locally based initiatives, groups and networks in the farming community adds to the effectiveness of demonstration activities (Franzel et al.,2015, Kiptot et al., 2006; Bailey et al.,2006).

The importance of embedding on-farm demonstrations (i.e. working with those pre-existing structures) in the AKIS was highlighted as critical in five workshop reports (FR, GR; BE-NL, DK-SW, UK). Appropriate coordination between the AKIS subsystems/actors, was for example mentioned as key in organising effective demonstrations in the BE-NL workshop, at the same time indicating that there seems to be room for improvement in that direction. The workshop in Greece highlighted the significance of interconnections of the organisations with local communities, flagging-up also that the reputation of the organizer is instrumental for effective demos. This same workshop report also confirmed to important points raised in literature, i.e. the fact that collaboration with local advisory/extension services should be a priority, and that demonstration activities are just one element of farmers' knowledge systems and they are not a substitute for other forms of information.

> *It is often an advantage to organise and invite to farm demonstration in cooperation between different organisations. Then researchers, farmers, advisors, authorities, farm industry etc. can all benefit from participating. (DK-SW WR)*

2.1.2 Type of organiser

The entities that may initiate and organize an on-farm demonstration can be very diverse. The following can be identified in the literature: a) farmers or farmers' organisations wishing to undertake their own peer-to-peer research and learning, working either independently or in collaboration with other entities (USDA/NRCS, 2013; ORC no date); b) private/commercial companies (Syngenta, 2016; Gros and Oldeweme, no date); c) NGO and/or other agricultural/ developmental organisations (Qamar, 2013, Okiror, 2016); d) Extension services or other advisory services (Penn State Extension, 2017); e) research institutes/ universities (Nuthall, et al., 2011); f) ministries or other related national agencies (Smallshire et al., 2004; BMEL, 2016; Kuipers et al., 2005). Usually, it is partnerships between the above-mentioned entities who are involved in initiating on-farm demonstrations and networks (Fisk et al.,1989; Stammen, 2016; NRCS, 2016; Mitchell, 2016).

While in our case studies organisers were distributed in almost all the above mentioned categories (with a notable exception of commercial companies) it should be noted that the feedback from the workshop reports was rather mixed on the role of the type of organiser on the effectiveness of the demo activity. One workshop report indicated that a public organiser can help to assure the neutrality of the event –and, thus, its goals and objectives- while another workshop report stressed that, the more public authorities engage in a demo event, the less likely farmers are to participate. As these remarks are rather case specific, possibly also depending on e.g. the specific topic of a demonstration, what one should probably keep in mind is that, regardless of the type of organiser, neutrality and open access of farmers to the events should be their overarching principles.

2.1.3 Type of funders

In most cases, according to the literature, demonstration farms operate within a funded project/programme, with the funder being of national (NFSM no date; Kemp and Michalk, 2011, BMEL, 2016), regional, or EU origin or operating within a co-financing scheme. Therefore, on-farm demonstrations make use of public funds, deploy private funds or a public-private co-financing scheme, and may be funded by one or multiple sources. Moreover, on-farm demonstrations can be fully or partially funded. Ideally, the budget should cover all expenses as, for example, inputs, transportation costs, organisation expenses, publicity expenses as well as guarantee any shortfall in yields or direct payments to farm owners/demonstration farmers (BMEL, 2016; Bailey 2006; Braga et al., 2001; Franzel, 2015). Finally, although the relevant literature stresses that participation in on-farm demonstrations is usually free of charge, however, relevant references are rather scarce and experience from the field (i.e. practitioners) indicate that fees can apply to both participants and initiators/organisers (i.e. companies wishing to carry out an on-farm demonstration).

Workshop reports indicate that public authorities are the main funders of demonstration activities, either through regional, national or EU funds or through programmes/projects. At the same time though, there seems to be a trend toward alternative financing models where mixed strategies are pursued with multiple funders, public and private, are co-financing events. In one workshop report, the role of donors (public benefit foundations) was highlighted as a promising funding source, which could be further explored.

The cross-case analysis referred to 15 case studies using a mix of external and internal funding, with the rest being funded internally either through a programme or by the host farmer/organisation. Public funding was present, either as a single source or in co-financing schemes, in 18 cases. Partner organisations and producers' groups followed, mainly as co-funders, in 7 cases, while in 6 additional cases events were self-funded by the host farmer/host organisation. Fees/funding by sponsors (commercial/supply chain companies) were reported in 5 cases and in 4 cases attendees (co)funded the activity. It should also be noted that while in 3 case studies participants paid an entrance fee for a large-scale event, these types of events (e.g. agricultural shows) are usually free of charge. Participants are more likely though to pay a fee when the demo involves training sessions. Finally, participants often pay indirectly for demos, through the membership payments of networks or advisory services who organise demos. Subsequently, their members can freely attend their demos.

2.1.4 Decision-making on the demonstration objective, content and set-up

Two broad knowledge exchange approaches are described in the literature. The first a top-down, institution-driven and more formalised approach, is underpinned by a linear model of knowledge transfer where scientific knowledge (as the authorised and only source of knowledge), technology or innovations are transferred to farmers. The second, less formal, bottom-up, farmer-driven approach, is based on a perspective that integrates knowledge from multiple actors through participation and emphasises facilitation of learning in a social context. The latter is based on the principles of empowerment and ownership of the problem and more inclusive methods of generating knowledge (Black 2000; Jiggins and Röling, 2002). However, whilst there has been an evolution in theory and a shift in practice towards more bottom-up approaches, top-down approaches are still valid/appropriate where information about a scientific innovation or technology needs to be communicated. Both these approaches correspond to different structures and are operationalized in the demonstration activity as mediation techniques. Ultimately the approach used needs to suit the overall goal of the demonstration and the intended audience. Participatory, collaborative, and co-governance models that aim to empower farmers' engagement, may contribute significantly to effective demonstration programmes and, in line with adult learning theories (Knowles, 1984), recognise that adults need to be involved throughout the whole process of their instruction. Involving farmers in the learning process, and making them accountable for their own learning, not forcing them to learn something, will foster a sense of ownership and autonomy. In practice,

this means that the more the local farmers and institutions can be involved in the whole process of a demonstration, the greater will be their self-confidence and readiness to participate and learn.

The abovementioned arguments fed discussions in the workshop reports and more specifically on who decides on the content and how the set-up of the observed demo events is being developed. A striking outcome of the cross-case analysis is that participants/attendees are rarely engaged in both the content development and the set-up of the demonstration event; when they do engage this is mainly indirectly through steering committees in which farmers' representatives participate or through their producers groups/associations. Interestingly enough, five workshop reports indicated that bottom-up processes (4) or at least a close collaboration of the host-farmer with the organisers (1) should be sought when deciding the content of the demo event. When it comes, though, to the set-up of the demo there are only a few case studies which have underlined that a bottom-up or at least a collaborative approach should be employed. Perhaps, one should consider if the bottom-up approach limits itself to the selection of demonstrators/facilitators and passes the responsibility of the content and set-up development to more - or less?- trusted and competent actors.

2.2 Goal of the on-farm demonstration

The goal of an on-farm demonstration can be multiple. Within AgriDemo-F2F, we could detect the following aspects that are relevant in defining a goal for on-farm demonstrations, regardless of the demonstration being a single event, part of a series, embedded in a programme or project, ...: the targeted objective, the topic of the demonstration, the degree, level and type of innovation and the sustainability dimension addressed.

2.2.1 Targeted objectives

The objectives that can be sought through on-farm demonstrations are numerous, and include awareness building and knowledge enhancement, research transfer and technology promotion, innovation uptake, feedback facilitation and promotion of participatory/bottom-up processes in agricultural development, etc. Furthermore, in many cases demonstration activities aim for a multiple set of objectives, for example one event can target facilitating networking and local community relations as well as the development of market opportunities. A brief description of some of these objectives is presented below.

Awareness

Demonstration farms can build farmers' awareness on topics that they are not aware of and correspond to their needs. Field demonstrations are an effective way to raise farmer awareness about new options and new possibilities. In turn, farmers may then seek more information about a technology if they wish to try it (Rice Knowledge Bank, n.d.; Bailey et al., 2006; EISA, 2010).

Knowledge creation

Demonstration farms are a source of knowledge for other farmers and regions' inhabitants. New knowledge in both science and agricultural practice is created on demonstration farms (field tests and/or experiments) as a result of the cooperation of farms' owners, specialists, researchers, field advisors, etc. The knowledge generated is also processed (modified, tested, improved) on demonstration farms in order to meet the specific goals of a demonstration programme (Kiełbasa and Kania, 2015).

Problem solving

A key element of demonstration projects is the opportunity for linking extension education provision with the needs of local farmers, with regard to innovative knowledge, i.e. to validate new technologies under local conditions. This reinforces bottom-up processes and ensures that the conducted research and proposed solutions are directly relevant and focused on farmers' needs and the problems individual

businesses are facing (Bailey et al., 2006, Smallshire et al., 2004; Rice Knowledge Bank, n.d., Franz et al., 2009; ORC, n.d.).

Innovation adoption

Demonstration farms allow for the creation of practical knowledge that can be used directly on farms. In that way, the possibility of farmers to observe the results of on-farm trials at demonstration farms, allows them to make a decision to introduce the innovations much faster (Madureira et al.; 2015). Demonstration farms are used, first, to display the results of conducted trials, showcasing the stakes in adopting a new practice and then to give the farmer an opportunity to practice new technologies/methods (Gibbons and Schroeder, 1983). Demonstration farms show how innovative methods work in practice and aim to convince farmers to adopt new management options with increasing confidence (Kemp and Michalk, 2011). Good field demonstrations can lead to higher adoption of demonstrated practices by farmers as confidence is developed amongst them in the practices demonstrated. Farmers need to see a new practice in operation, or talk to someone actively engaged in the practice (peers) (Miller and Cox, 2006). In that way demonstration farms provide an effective learning situation as farmers "See the crops themselves", "interact with the scientists and extension workers on the fields", and "get doubts clarified themselves" (ICAR, n.d.).

Policy implementation

Farmers engaged in demonstration activities get advice, information and knowledge about innovative practices and/or regional, national or EU agricultural policies (EISA, 2010; ORC, n.d.). At the same time, demos aim at balancing farmers' interests with overall EU policy goals and priorities targeting public goods (Bailey et al., 2006). Thus, demonstration farms provide the opportunity for growers to comply with EU and national regulations. Setting up and strengthening structures to share skills and expertise both on academic-research basis and through practical approaches allows for showing the progress towards achieving the EU objectives (Kiełbasa and Kania, 2015).

Training

Demonstration farms serve as a platform for training and education on agriculture and the environment, enabling practical implementation of innovative methods on the ground and the dissemination of knowledge on best practices to all interested stakeholders (EISA, 2010; Syngenta, 2016). According to available literature many different teaching methods are employed in the frame of demonstration events such as training sessions, workshops, lectures, seminars, courses (EISA, 2010, Kiełbasa and Kania, 2015, Rice Knowledge Bank, n.d., Franz et al., 2009; Maatoug, 1981), with the aim to transfer knowledge to farmers or to develop certain skills (Kiełbasa and Kania, 2015). In that way, on-farm demonstrations are a valuable tool in the teaching of new management practices or technologies to the involved farmers as well as the whole community within which they live and work (Warren et al., n.d.). They are also part of a long term educational activity that offers training opportunities to farmers as well as experience exchange throughout open events and other dissemination actions throughout an area (ICAR, n.d., Syngenta, 2016).

Networking

Demonstration farms foster discussions among local producers (Kemp and Michalk, 2011). Demonstrations are also designed to illustrate the benefits of strengthening the links between producers and their markets, the food chain industry, local communities, local authorities, consultants and national agencies (Bailey et al., 2006, EISA, 2010). In many cases demonstration farms operate within a cooperation network. The network approach is characterised by various formal and informal connections between network participants and the interactions among them. The process of knowledge exchange taking place is complex and multidimensional, while knowledge is created, generated, supplemented and processed at many levels. The network approach contributes to the strengthening and development of collaboration based on partnership for cooperative problem solutions, the implementation of innovative

results and the dissemination of knowledge and information (Kiełbasa and Kania, 2015). The demonstration farms are the "meeting place" for all network participants (farmers, advisors, researchers), as well as for further stakeholder engagement. Thus, the discussion to achieve practical, realistic solutions is facilitated (EISA, 2010;Kiełbasa and Kania, 2015). Networks also enable the public involvement, engaging consumers and contributors through events and visits (EISA, 2010).

Research implementation

In demonstration farms the transfer and implementation of applied research results to agricultural practice is realised. In the experimental part of the demonstration farm's functions, if there is any, technologies, innovations tools and methods are trialed, compared or validated (Kiełbasa and Kania, 2015). Demonstrations are designed to take innovations out of the 'unreal', scientific realm of the research station and place them firmly within the boundaries of a farmer's everyday experience (Gibbons and Schroeder, 1983). Thus, a consistent system of knowledge and information exchange between science and practice occurs as on-farm demonstration projects create an opportunity for producers to engage directly in research implementation and the conducting of experiments, usually in the frame of funded projects or any other research set up (ORC, n.d., Kiełbasa and Kania, 2015).

In general, reported objectives in our case studies are in accordance with the overall goals referred to in the available literature. Especially the promotion of specific agricultural schemes, the presentation of field trial results, training/skills acquisition and networking facilitation are highly prioritized according to the cross-case analysis. It should be noted, however, that in most cases on-farm demonstrations served multiple goals and objectives, some explicitly referred to, while others were pursued in practice even if not mentioned as a priority. This is evident in the detailed results of the cross case analysis that follow (numbers in parenthesis correspond to the number of cases for which each category was mentioned).

Declared demonstration objectives were to showcase farm management options in practice, to inspire transitions to alternative schemes (7) (agroforestry, agro-tourism, organic production, precision agriculture, alternative cultivations), to enhance networking /contacts /collaborations (11), to present field trials (7), to improve the access to market (2), as well as training /skills acquisition (4). In addition, focus on problem solving have been mentioned as a key characteristic in 7 case study reports, while support of decision making (1), knowledge exchange/transfer (4), policy implementation or prepare farmers for the new regulations (1), show new possibilities (1) / best practices (2) / good management examples (3) were also mentioned.

2.2.2 Topic and diversity of topics

The demonstration event topic should always be in accordance with the goals and the objective of the organising scheme, and relevant for farmers' needs and project goals. Farmers are highly motivated to attend meetings when their needs are directly and specifically addressed (Franz et al., 2009; Kemp and Michalk, 2011). Effective demonstrations deal with topics in which people are already interested, or else demonstration must arouse their interest (Hancock, 1997). In the frame of the declared goals a manageable/testable demonstration topic or problem statement should be chosen. It is crucial for the organising scheme to avoid working either on problems whose outcomes are highly predictable and have little or no impact, or on complex problems that are unmanageable (Bailey et al., 2006, Hancock, 1997), whereas the strength of the demonstration should lie in its simplicity. Therefore, only one topic must be covered at a time, especially in a method demonstration (Gibbons and Schroeder, 1983, Khandelwal, n.d). Generally, demonstrations of one practice at a time are found to be far more effective than ambitious multiple-practice or over-complex demonstrations or management demonstrations involving a number of factors. It is better to proceed step by step with a number of consecutive demonstrations than trying everything at once (Oakley and Garforth, 1985; Rice Knowledge Bank, n.d.).

Nevertheless, according to the cross case analysis, only 3 cases focused on a single topic during their demo event while concentrating on one single topic during demo events has been indicated as critical/key for the demonstration effectiveness only in 1 workshop. At the same time, though, only 1 workshop argued that a diversity of topics could result in improved effectiveness of a demonstration event. This mixed and rather inconclusive picture may indicate that the process of translating the goals/objectives into topics does not always attract appropriate attention and organisers tend to over-invest on multiple topics. It may also indicate that the quite complex and demanding farming realities require that, even when a single topic is selected, this should expand to cover additional dimensions that link to or supplement it. In the latter case, there might be a trade-off between simplicity and perceived attractiveness of demonstrations, with both parameters potentially impacting upon effectiveness.

As noted earlier, the vast majority of case studies worked on more than one topic, with a total of more than seventy (70) topics reported in all demonstrations events (see Table I, in Annex I).

2.2.3 Sustainability dimension(s)

According to the literature, many of the declared objectives of on-farm demonstrations are more general in relation to environmental protection, economic sustainability and profitability, and social aspects. Some demonstrations promote specific agricultural schemes like organic farming, IPM, precision farming or specific production improvements, etc. Other demonstrations focus on the integration of new technology and/or new approaches to management, the raising standards of on-farm efficiency, decreasing inputs, increasing outputs and profitability (Business Wales-Farming Connect n.d.; Rice Knowledge Bank, n.d.) which touch upon multiple sustainability dimensions.

Sustainability dimensions (social, economic or environmental) are explicitly referred to in only 5 case studies (as objectives and/or topics). However, by simply going through the reported demo topics (Annex I) it could be argued that sustainability dimensions are "included" in the goals of further case studies, even if not explicitly.

2.2.4 Type, level and degree of innovation

An important factor that must be taken into account is the innovation's characteristics (Maatoug, 1981) in relation to the characteristics of the target-farmers. Innovations have to be consistent with farmers' circumstances, compatible with the actual farming system and corresponding to farmers' goals and preferences (Venkatasubramanian et al., 2009). The innovation selected for demonstration can vary considerably addressing, for example, product, process, organisational/management options or can be related to marketing issues. Different types of technologies differ in their inputs and management complexity, operational flexibility as well as in the waiting period for the benefits to appear, etc. (Krah, 1992). Finally, some demonstration farms are showcasing low cost innovations and other demonstration farms are showcasing state of the art technologies[4].

Product and process innovations are closely related to the concept of technological developments. A product innovation is the introduction of a good or service that is new or significantly improved regarding its characteristics or intended uses; including significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics (OECD, 2005). Product innovations can utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies. A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products.

[4] https://www.arec.umd.edu/extension/ume-arec-programs/demonstration-farms

Finally, an organizational innovation is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations. Organizational innovations tend to increase performance by reducing administrative and transaction costs, improving workplace satisfaction (and thus labour productivity), or reducing costs of supplies (OECD, 2005).[5]

Another categorisation of the different types of innovations relates to the overall number of interventions in the demonstration plot, the number of innovations put together and the degree of the interdependence between the innovation elements. Single practice demonstrations aim at proving the worth of a single practice such as the effect of an improved/new variety, fertilizer, irrigation scheme/technology or pesticide, etc. applied to one crop (ICAR, n.d., Mutsaers et al., 1997, Krah, 1992) thus showing only one adjustment to the farmers' practice (DAE, 1999). In other cases, demonstrations are used to show the effects of *package* technology, consisting of several *independent* components. The objectives of this type of demonstration are to bring together all the recommended practices to be used for a particular crop. Finally, demonstration farms are also used to show the effects of the implementation of multiple products or technology solutions. Usually these demonstrations have to do with *composite* technologies, consisting of several *interacting* components which cannot be applied separately or require changes in the farmers' cropping pattern. In this case the effect of one practice in harnessing the effect of other practices is also demonstrated and studied (ICAR, n.d., Krah, 1992) and new practices are not shown separately but within the whole functioning of farms, influencing other factors occurring on the farm.

Such whole farm demonstrations, in which package and/or composite technologies are showcased, serve as examples in developing a successful farm business (Kittrell, 1974; Rzewnicki, 1991; IFAD, 2012). Consequently, farmers have the opportunity to get acquainted with all available knowledge, i.e. for a particular crop as well as the maximum return that comes from the whole package put together (DAE, 1999). New practices are not shown separately but within the whole functioning of farms. They are conducted mainly for crops which are new in an area (which variety and when, what fertiliser and when, what water management, how to control pests and diseases and all other aspects of production) (DAE, 1999). They may also concern an extensive change in relation to the overall management of a traditional crop. They have the advantage over one-practice demonstrations in that they put together all practices. Consequently, farmers have the opportunity to better understand the maximum return that comes from the whole package put together (Kittrell, 1974; DAE, 1999).

The degree of deviation of proposed innovations from a region's current practices may vary a lot. More specifically, a radical innovation introduces fundamental changes in a firm's products, processes, technologies and organizational structure and methods (Song et al., 1998, OECD, 2005). A radical innovation may be totally new to the region, so it initially relates to a pilot project in demonstration area. It may also concern an innovation not totally new to a region, i.e. implemented by a minority of farmers, although not common in the community. On the other hand, an incremental innovation entails the refinement and reinforcement of existing products, processes, technologies, organizational structure and methods (OECD, 2005, Chandy and Tellis, 1998). It thus refers to an intervention/improvement in the 'conventional' farming system. Finally, a demonstration may simply serve the showcasing of existing experience, i.e. focus on experienced (demo-) farmers.

While a strict discrimination between the topics and the innovations demonstrated was not always straightforward, the cross-case analysis attempted to cluster demonstrated topics in the abovementioned categories. It should be noted that it is not always easy to categorize the type of the innovation demonstrated, as different type of innovations coexisted in most of the cases analysed. Thus, although a

[5] For the purposes of this report, we have added in that category (organisational innovations) also marketing innovation, defined as the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing (OECD, 2005). Marketing innovations target at addressing customer needs better, opening up new markets, or newly positioning a firm's product on the market with the intention of increasing firm's salessimplicity,

category (i.e. alternative management options) is referred to in some cases these may be also included in other cases in which they were not referred to explicitly (i.e. tools and technologies demonstration). This exercise was conducted in two steps: In the first place researchers went through the case studies report as well as the case study tools (interviews and/or observation tools) to retrieve relevant information and indicate in which categories case studies could fit. This resulted in a detailed table which was then shared with all project partners (as case study experts) in order to confirm or revise the indicated categories for their case studies. A detailed presentation of each case study categorisation is found in Annex I - Table II of this report. Table 1 below provides a summary.

Although tentative in its nature, this categorisation shows the following for the case studies in the project. In general: a) they have multiple elements of different types of innovations; b) they employ a "whole-farm" approach (only 2 cases focused on single innovations); c) two out of three were characterised as focusing on incremental change; and d) only one in four demonstrated something entirely new, while one third of all case studies invested on well-established topics.

More specifically, in the vast majority of case studies (27) product and process innovations were demonstrated in parallel. In four of them, elements of organisational innovations were specifically indicated, despite the fact that several processes may impact upon, introduce or require a new organisational method in the farm's business practices of other case studies as well.

Finally, an interesting detail of this tentative analysis is that radical innovations tend to be demonstrated in countries in which the AKIS system is more robust and well organised. This seems to be also the case, when the on-farm demonstration works on a novelty.

Table 1: Type/level and degree of innovation demonstrated in case studies [1]

	Type/level of Innovation						Degree of Innovation				
	Product (a)	Process (b)	Organisational (c)	single	package	composite	incremental	radical	novelty	In between	Well – established
CSs only with b		4 (DK3; GR3; UK1; UK2)			1 (GR3)	1 (DK3)	2 (GR3; UK2)	2 (DK3; UK1)	2 (DK3; UK1)	1 (UK2)	1 (GR3)
CS with both a&b	23	23		2 (BE2; NL3)	13	9	16	7 (FR1; IR2; SE1; SP3 SW2; SW3; NL3);	5 (AT2; SW2; SW3; NL1; NL3)	11	7 (AT1; GR1; IR1; IR3; SE1; SP3; NL2)
CS with all a&b&c	4 (BE1;BE 4;SP1; SP2)	4 (BE1; BE4; SP1; SP2)	4 (BE1; BE4; SP1; SP2)		3 (BE4; SP1; SP2)	1 (BE1)	3 (BE4; SP1; SP2)	1 (BE1)	1 (BE1)	1 (BE4)	2 (SP1; SP2)
Total	**27**	**27**	**4**	**2**	**17**	**10**	**21**	**10**	**8**	**13**	**10**
cases		**31** *			**29** **		**31**			**31**	

[1] *Based on detailed data presented in Table II – Annex I*

**no event in CSs: GR2; SE2; UK3; data not sufficient for FR3*

***no relevant data in UK1 and UK2*

2.3 Host farm & Logistics

2.3.1 Good access

Sign posts (road, parking)

A demonstration field should be conspicuous or in readily noticeable site at central point, to attract maximum attention of audience/farmers for more impact and feedback (NFSM, n.d.; Cunningham and Simeral, 1977). Locations near roads or footpaths or on the immediate outskirts of a village are ideal and should have a sign indicating what is being done and who can be contacted for further information (Rice Knowledge Bank, n.d.; Gibbons and Schroeder, 1983). During the demonstration event, signs can be erected to attract further attention and provide explanations of the demonstration. Signs need to meet the visual literacy levels of a majority of the farmers observing the demonstration. Those signs and/or posters can be also used to direct the farmers to the demonstration (Gibbons and Schroeder, 1983). As far as the test strips is concerned, a sign outlining each treatment and who to contact for more information should be placed (Rice Knowledge Bank, n.d.).

The cross case analysis highlighted that in 12 out of 35 of our cases, the organisers used signposts in order to help visitors to find location. Moreover, sign posts have been mentioned as a key characteristic of events' effectiveness in one case report.

> *Upon arrival, people were shown the parking and given the programme of the day. It was very easy to find, since there were banners outside the farm. (DK2)*

Travel distance

The demonstration site characteristics are mentioned in the literature as key factor, determining the success of a demonstration effort. Demonstration fields should have good and easy access in relation to desirable audience. It has been shown that the location of demonstration plots may be a major barrier to participation causing poor attendance due to long distances - while audience farmers tend to communicate with demonstrators living near them (Rice Knowledge Bank, n.d.; Okiror, 2016; Cunningham and Simeral, 1977, Bailey, 1964). In that way, limited access negatively affects adoption due to proximity constraints and social exclusion (Mbure, n.d.).

The effort rate of participants to attend the demo was mentioned as a very important factor in 7 out of 21 case studies. Thus, the travel time is an important factor that may discourage people from attending a demonstration. In thirteen case studies, the travel effort to participate was mainly rated as low, in six cases as average and only in two the travel effort was rated as high. It is important to mention, though, that in most cases it was not clear if the effort rate is related only to the travel distance as, in many cases, the effort ratings were not proportional to the distance attendees had to travel. Thus, although distance of the demo site is indeed important, the effort attendees should make to participate may be also related to other factors i.e. participants motivations, free time etc.

> *If they have to travel far, they spend some time on that and get behind with the tasks at their farm. If it is very far away they have to pay someone else to do the work at their farm. If there is a fee for attendance it can also discourage people from attending but I think the main factor is finding time. (UK WR)*

Another related interesting point was made during the UK workshop, where there was a discussion on virtual demos, and their potential to provide access to the information of the demo, while overcoming the effort of traveling.

> *Providing virtual demos to those who cannot attend offers the information and may act to attract participation next time. (UK WR)*

2.3.2 Suitable facilities

Space to interact

The learning environment of field days usually encourage an open and informal atmosphere in which visiting farmers can inspect, inquire, question, etc (DAE, 1999). It is proposed that the responsible agent should move the discussion to areas where all participants can see and hear. It is also pointed out that if possible, discussions should be held under shaded areas of the field (Rice Knowledge Bank, n.d.). The existence of appropriate farm infrastructures and welfare facilities (toilets, rest area, shelter from rain, wind, etc) are required during demonstration events. The discomfort coming due to the lack of such infrastructures leads to ineffective field days[6].

The cross case analysis showed that in 15 cases, the organisers used a room for formal activities (lectures and discussion) or more informal activities (to relax/rest, eat and/or discuss). In addition, tents for shading as well as toilets for participants (in large scale events) have been mentioned in 2 cases.

Good audio/sound

The materials or inputs necessary for the demonstration event should be locally and timely available and arranged conveniently for use (e.g., audio-visual aids, loud-speaker, etc.) (Gibbons and Schroeder, 1983, Oakley and Garforth, 1985). It is highlighted that all the details of the demonstration must be carefully prepared in order to run smoothly, and all the support material must be checked to be ready.

The analysis highlighted that in the 16 events in which audio/sound facilities were used, a good quality audio/sound result has been achieved.

> *Mentioned as a suggestion to improve the demonstration: If it is a large group, make sure everybody can hear and see everything. (SW2)*

Correct security measures

Although not mentioned specifically during the case studies or workshops, or found in literature, this was mentioned as a point of attention during the 5th General meeting with partners in Nantes. When organising an on-farm demonstration, it is important to think of for example insurance, risk management, first aid and biosecurity measures.

2.3.3 Catering (food and drinks)

An important feature of on-farm demonstrations is that they are usually run in a more informal and less highly structured manner (Rice Knowledge Bank, n.d.; Oakley and Garforth, 1985; Hancock, 1997). A field day, for instance, is a day out for farmers and is often a welcome relief from their daily hard work. In that way, additionally to formal educational sessions, it may include non-educational elements like music, awards, ceremonies, prizes, invitation of special guests and speakers, meals and refreshments (Gibbons and Schroeder, 1983, Oakley and Garforth, 1985). Especially food, refreshments and points for rest have been highly noted as important arrangements during a demo event, according to literature (Okiror, 2016; Rice Knowledge Bank, n.d.; Oakley and Garforth, 1985).

The cross case analysis indicated that in 21 out of 35 cases, catering/food and drinks were available for the attendees. Catering arrangements are mentioned as a key characteristic for events' effectiveness in 8 case study and 3 workshop reports, whereas 6 case studies argued that as a demonstration is also a social event, food and drinks support these social aspects.

[6] http://www.balticdeal.eu/advisory/demo-farms/

A joint dinner at the end of the demonstration event is ideal to reflect and discuss the demonstrated management practices and exchange opinions of what the visitors have learned throughout the day. (AT WR)

2.3.4 Registration

Registration at the beginning of a demo event is often done, mainly when it is necessary for project financing or for organisational purposes, e.g. for follow-up and/or evaluation. When an attendance list needs to be completed, this should be organised fluently, without people having to wait too long upon arrival. It's often organized together with providing info to the participants on the demo event itself or on new forthcoming events which makes it worthwhile for the participants to register. This is related to the key characteristic 'follow-up materials'.

The cross case analysis showed that name tags have been used by the organisers only in 9 cases. Name tags have also been mentioned as a key characteristic for events' effectiveness in one workshop report. Nevertheless, discussions on this revealed that in some regions this is not done, this it appears to be also depending on the culture and habits in a region.

2.3.5 Participants can relate to the farm

Demonstration activities can be hosted on a university/research center/extension site (Nuthall et al., 2011; Dirimanova and Radev, 2014); private or public owned field, granted or leased to the aforementioned organisations; demonstration farms owned by a commercial farmer or by farming organisations, NGO's[7], etc.; and industry owned demonstration farms. However, for effective peer-to-peer learning to occur, it is important that the demonstration farm operates under the same conditions as average commercial farms, i.e. subject to normal regulatory constraints, and using the innovative production systems or agricultural practices/technologies in the course of its normal commercial farming activity (Bailey *et al.*, 2005). Related to this, one of the most critical factors for demonstration effectiveness, according to literature, is the farmer's ownership of the demonstration farm (Gibbons and Schroeder, 1983; Bailey et al., 2006; Miller and Cox, 2006). This contributes to solving the problem of the application of new knowledge in the own working context, which becomes difficult when the space where the learning takes place doesn't resemble the working context of the farmer enough (Illeris 2003; Restrepo et al. 2018). There is a greater chance of making an impact when a demonstration occurs on an actual working farm, at field scale, setting innovations outside of the 'unreal', scientific realm of the research station and placing them firmly within the bounds of a farmer's everyday experience (Gibbons and Schroeder, 1983; Lauer, 2009). That way, during on-farm demonstrations, farmers can see particular technologies or management practices in operation on a working farm not too dissimilar to their own (Miller and Cox, 2006; Bailey et al., 2006).

The vast majority of case studies' demonstration events were hosted in commercial farms, which was a clear focus of the AgriDemo-F2F project from the start. Nevertheless, four workshop reports and three cases studies have specifically mentioned that hosting demonstration activities in the "real life" conditions of commercial farms is pivotal for effective on-farm demonstrations.

Also, 10 of our data sources mentioned the importance of 'real life farm conditions' explicitly. This also partially relates to recruitment, i.e. when farmers know through the invitation that the demonstration will happen on a farm with conditions (partially) resembling their own. Some examples:

… tried to work with real life "conditions". X works in its demonstrations on "real" farmers' equipment. In the same vein Y promoted "real life" condition simulation in cheese production with

[7]http://www.siddc.org.nz/sthld-demo-farm/sthld-demo-farm/

the active participation of attendees at all productive stages. Discussions has pointed out that a demonstration must be arranged through a "real condition" manner. (GR WR)

Demos should be based on real farm conditions. Learning from failures is equally useful and important to learning from best practices. (GR WR)

2.4 Demonstration event set-up

2.4.1 Group size

Group size is an important characteristic to consider when planning the set-up of a particular demonstration event. Literature states that farmers get more out of smaller groups and ideally not more than 20 farmers should attend, otherwise it is difficult for everybody to see and hear or even more difficult for everybody to get opportunity for a 'hands-on' experience (DAE, 1999; Bailey et al., 2006). When fewer farmers participate, it is easier to obtain a more in-depth discussion in which every attendant can participate (Bellon, 2001). There is in general no 'bad' or 'good' group size, but it does influence the planning of the demonstration. For example, when one of the aims is to have a lot of attendees, discussion in smaller groups could be scheduled as part of the demonstration, to still create opportunities for more in-depth discussions.

In 1 of our case studies, it's stated that the attendance of many participants made the demo more effective (related to an event of about 350 participants). On the contrary, 5 workshop reports and 8 case study reports clearly state that smaller groups (up to around 25 people) are more effective. This is related to explanations such as: 'because this makes it easier to ask questions and give everybody the chance to take part in group discussions.' Generally, participants mention less than 30 attendees as an ideal group to answer questions and create discussion, but of course, the ideal group size is strongly linked to the goal of the demonstration. A practical solution here could be to divide bigger groups in smaller groups for Q&A sessions and discussions.

Illustratively, when asked for the ideal group size in their own opinion, a participant in the interviews stated: *For planning and deep discussion: up to 10. For discussion and involvement: up to 25. For interest and knowledge transfer: bigger.*

2.4.2 Trustworthy demonstrator(s)

Different authors state that farmers (and small scale foresters) tend to be most influenced by proof of successful farming methods by their peers (Kilpatrick and Johns, 2003; Warner, 2007; Schneider et al., 2009; Hamunen et al., 2015). Also in several of our case studies it was confirmed that during a demonstration event, participants tend to take up information better from demonstrators they trust, and consider as "qualified enough", although it's not entirely clear what this exactly entails. This could be a peer farmer, explained by the fact that the working situation of peer farmers is likely to be relatable and thus comparable to the ones of the visiting peer farmers (see also 2.3.5). But additionally, it is also mentioned that skilled advisers and researchers can be adequate to take on the job of trusted demonstrator. Also, when the demonstrator is someone considered as 'qualified enough' by the target audience, and this is communicated during the recruitment period, this could influence the attendance rate.

More specifically, participants of 18 case studies refer to attributes of the demonstrator as an important characteristic influencing the effectiveness of the demonstration event. They refer to the importance of the demonstrator being e.g. experienced, knowledgeable, competent, experts in their field, a real farmer, someone with teaching skills, a good speaker, etc.

Many of the participants said they came because of the host farmer. (AT1)

2.4.3 Role division

During demonstration events, it is beneficial if the different organisational roles are clearly appointed to someone. Depending on the demonstration (e.g.: on its size), someone will need to be for example the main speaker, the facilitator, the logistics manager, the coordinator or take up another role.

In 10 cases, the preparation and structure of the demo was mentioned as a key to have an effective on-farm demo. A clear role division supports this aspect. In two cases and during the GM 5 meeting, the value of having a neutral facilitator who guides discussions was highlighted. This is further described under 2.6.3.

> *There was a unanimous opinion that a successful demonstration activity (field day) needs a good coordinator and facilitators. (AT WR)*

2.4.4 Available time for the demo

The available time for the demo is a determining factor when making decisions on which content to address and which learning methods to use. This could range from one hour to half a day, to a full day or even multiple days. In 2 of the case studies it's stated that one day for the demo event would have been better than half a day and in 3 other case studies the event felt 'rushed' and more Q&A and discussion time would have been better. This is in line with Millar & Curtis (1997), who state that there should be enough time for questions. None of the case studies stated the demo event took up too much time. Of course, taking out more time for a demo event is not always possible or necessary, but the available time does strongly impact the planning of the demo event.

2.4.5 Available budget

Ideally, the budget should be planned to cover all expenses as, for example, inputs, transportation costs, organisation expenses, publicity expenses as well as compensating any shortfall in yields or direct payments to host farmers (BMEL, 2016; Bailey et al., 2006; Braga et al., 2001; Franzel, 2015).

The source of the budget is varied throughout the case studies: private, public or mixed. However, we did not collected specific data about actual available budget, how it was spent/distributed, and if and how it affected the outcome of the demonstration event.

2.4.6 Scope of the demonstration event

Closely linked to the goal of on-farm demonstrations, we distinguish between different possible scopes for a specific demonstration event. Some demonstration events focus more on a single technique, others will take on a whole farm approach, or will situate themselves somewhere in between these two.

Related to this, facilitating the application and integration of the provided information in whole farm or enterprise perspective, or taking an interdisciplinary approach in delivering a demonstration, is seen in literature as more effective (Hancock, 1997; Millar & Curtis, 2009).

In three cases, participants addressed a whole farm approach as a characteristic of the demonstration event contributing to its effectiveness.

> *I think if there was a number of demonstration farms where this kind of integrated approach was on view it would work a lot better. Our normal forestry approach is looking at forests but we want to show it as a compliment to farming rather than competition. It is an integrated thing. (IR2)*

2.4.7 Type of demonstration

Regarding the type of demonstration, we made a distinction between demonstrations that are part of a series revolving around the same topic and are being organised more than twice a year (not necessarily on the same farm), demonstrations that re-occur annually, and one-off demonstration events. A series of field days, especially in cases in which the demonstration is available for a season/year and showcases a cropping pattern, provide an ideal opportunity for farmers to meet again (DAE, 1999).

This was confirmed by our data, where for 3 of the case studies it was mentioned that series of demonstration events are more effective compared to one-off demonstration events. Possible reasons were further discussed during the 5th General Meeting in Nantes. For example, participants might know and trust each other better, which makes them less reluctant to share information. Also, comments on a specific demonstration event can be followed-up and addressed during a next event, which improves the demonstration. Also, on-farm demonstrations can build up a good reputation, during the series of events, making it possible to attain higher attendances rate and attract multiple stakeholder types.

2.4.8 Composition of the group

The group of attendees during a specific on-farm demonstration event can differ in age, gender and occupations, amongst other aspects. Groups can be either more homogenous or heterogeneous. There is however no 'right' group composition, since this is related to the intended demonstration goal and target audience, which is in turn linked to recruitment for the demonstration. Literature on this also does not support a clear choice, with evidence on one hand for value in organizing demonstrations for clusters of peer farmers (Janvry et al., 2016; Franzel et al., 2015; Rogers and Leuthold, 1962). On the other hand, the presence and participation during a demonstration event of multiple stakeholders, in addition to farmers, i.e. industry representatives and/or specialists, government agencies and any related local entity, can contribute to the overall events' effectiveness (Bailey et al., 2006; Kiełbasa and Kania, 2015; Franzel et al., 2015; Nuthall et al., 2011).

This was again reflected in the case study data. 4 cases mention 'an interested group' as a characteristic supporting effectiveness of their demo. 2 workshop reports mention homogeneity as a supporting factor, described as 'a like-minded group' and 'perceiving each other as equal'. This could make attendees feel more at ease and willing to share. On the other hand, 6 sources refer to the attendance of different types of actors as beneficial, to spark discussions and networking, and to be able to look at the same problems together but from different angels.

> *Almost everyone (consumers, farmers, policy makers, demonstrators, host farmers, organisers) saw the added value of this event. The farm was mostly an inspiring environment for networking between farmers and policy makers. (NL2)*
>
> *The main strong aspects of the demonstration included the many actors together, which gave an excellent synergy effect. (SW2)*

2.4.9 Group connectedness

Literature states that working with pre-existing locally based initiatives, groups and networks in the farming community adds to the effectiveness of demonstration activities (Franzel et al., 2015; Kiptot et al., 2006; Bailey et al., 2006). For the case studies, the extent to which participants knew each other previously differed. This can influence the appropriateness of some learning methods over others. Participants who don't know each other are for example more likely to be reluctant to take part in discussions. These types of groups might need organised facilitation methods to spark networking, sharing and discussions.

The fact the group had met before meant participants and demonstrator could build on previous discussions and had prior knowledge. (UK1)

2.5 Recruitment

2.5.1 Invitation adapted to target audience

It is fundamental for the demonstration management team to set clear goals and objectives which are relevant to the target audience and to communicate these goals clearly (Bailey et al., 2006). When it comes to recruitment, the goal(s) of the specific demonstration event should thus be clearly communicated well beforehand, as mentioned in 4 of the workshop reports and clearly stated in two of the case study reports, and should correspond to the expectations of the intended target audience, and the way you want to have this composed (homogeneous vs. heterogeneous, see also 2.4.8).

20 of our case studies used some form of personalised invitations, which was also recommended in one workshop report. It was also indicated that this is not feasible, or maybe necessary, for every type of demonstration event. Also during the 5th General Meeting the importance of having invitations adapted to the target audience was stressed. Important aspects to consider is the use of a language or jargon adapted to the target audience and an attractive, clear and simple lay-out.

2.5.2 Suitable period (timing & season)

Demonstration events need to be done during the correct season or period (Hancock, 1997). This has to do with ensuring appropriateness of the content to the current season and the tangible benefits that its application could provide (Gandhi et al. 2007). In general, demonstration events are optimally scheduled when particular management activities are implemented or when the benefits of the demonstration would be most beneficial, such as during harvest time (DAE, 1999). The risk related to organising a demo during harvest time, is that farmers will be too busy to show up.
8 case study reports mention scheduling of a demonstration event during a suitable period as an important factor influencing the attendance rates, which in turn has an effect on the effectiveness variables related to the extent of learning. During bad weather conditions or periods when there is a lot of work on the farms, organising on-farm demonstrations is not recommended. This is also mentioned by 5 workshop reports and was confirmed during the GM5 meeting.

They expected 200 participants but only 110 had registered and less than 100 showed up. The demo was held in the first warm week, so all the farmers were very busy doing field work and they think this was the main reason for the lower attendance rate. (DK1)

2.5.3 Publicity

Regarding recruitment, media coverage of the demonstration event is important for its success (Cunningham and Simeral, 1977). The extent of the publicity campaign, e.g. through the use of internet, social media, meetings, letters, posters, newspaper articles, and radio and television promotions can determine the outreach (Hancock, 1997). Furthermore, it is important to situate the demonstration recruitment 'campaign' in the wider advisory (and regulatory) landscape and avoid overload or conflicting information.

14 cases in the cross case analysis highlighted that the appropriate extent of the publicity about the demo event and choice of communication channels is strongly linked to its goal and targeted audience. In 22 of our cases, demo events were promoted using multiple communication channels.

Announcement of the event through diverse channels brought a mixture of attenders encompassing farmers and students, and professors of agriculture. (SE1)

2.6 Learning methods

2.6.1 Activities supporting interactive knowledge exchange

Learning through interaction is learning through dialogue, debate, questioning and reflection. According to Keen et al. (2005) effective learning dialogues need to be processes that create the space and time for a range of different types of dialogue, in particular, and as an inspiration to design appropriate activities: a) disciplined debate b) interpersonal exchanges: smaller group meetings to build trust and a learning environment and c) creative dialogues: regular meetings with open agendas to nurture relationships.

There are numerous activities that can be organised during an on-farm demonstration event that support interactive knowledge exchange. A farmer telling his honest story, a visually supported presentation and poster stands are examples of potentially effective knowledge transfer activities. More participatory activities include discussion set-ups and question and answer time, amongst others. In terms of learning, these participatory activities require the attendee to take part in a more interactive form of learning. Therefore, these activities are generally seen as an effective addition to pure knowledge transfer activities. For this statement we found not only evidence in the widely applied Farmer field school philosophy, which integrates principles of experiential learning (Nederlof & Odonkor, 2006), social learning (Pretty & Buck, 2002), and nonformal transformative learning (Taylor, Duveskog, & Friis-Hansen, 2012) to provide a framework in which farmers, by interacting simultaneously with their cotrainees and the agroecosystem, improve their critical thinking skills, enhance their decision-making capacities, sharpen their analytical skills (Kenmore, 2002), and develop collaborative linkages with their colleagues (van de Fliert, Dung, Henriksen, & Dalsgaard, 2007) (Van den berg & Knols, 2006). But also in the numerous different perspectives, based on social and participatory learning processes related the learning in agriculture for sustainable practices, such as: learning in communities (Falk and Kilpatrick, 2000); social movement theory (Hassanein and Kloppenburg, 1995); diffusion theory (Padel, 2001) and the interchange of local and scientific knowledge in groups (Millar and Curtis, 1999). All these conceptualizations recognise the importance of interactions and linkages among parties with a shared experience. Such collective experiences provide a forum for social learning, a process in which actors collaborate and adopt a shared style of problem solving through local experimentation and observation, recognising the effective interplay of certain effective knowledge transfer activities with more participatory interactive activities (Woodhill and Röling, 2000; Leeuwis and Pyburn, 2002).

As an example of an effective observation activity, 8 case study reports mentioned 'being able to compare practices in the field' as an effective characteristic of an on-farm demonstration.

> *For example the visualisation of old, long-straw wheat varieties, which lie down because of heavy rain against modern short-straw varieties standing on the field under the same weather conditions. (AT WR)*

On the other hand, our case studies confirm in general the effectiveness of learning through social interactions. 20 case study reports referred to the importance of the possibility to ask questions while having an open and supportive atmosphere to do so. Additionally, 11 case study reports brought up the importance of having discussions in which most attendees can participate.

2.6.2 Activities supporting experiential learning

In addition to activities that support interactive knowledge exchange, integrating activities supporting experiential learning could influence the effectiveness of a demo, as already mentioned in the previous section as a basic principle underlying the popular Farmer Field Schools philosophy. Examples are field

walks including multi-sensorial experiences (e.g. touching real plants), observing practical demonstrations carried out by a demonstrator and having the opportunity for hands-on or other multi-sensorial experiences. Farmers emphasize the value of 'learning-by-doing' in a multitude of studies (e.g: Restrepo et al. 2018). For example, Sewell et al. (2014) already described the value of designing multi-sensorial experiences in farmer learning events including walking, talking, listening, observing, tasting, smelling. With specific reference to demonstrations, Millar and Curtis (1997) recognised how interactions between participants were most significant when practical activities were deployed. Hancock (1997) identifies a key function of extension activities as providing the opportunity for farmers to apply practices. The opportunity to do so enhances learning and understanding. Theoretical evidence for this is found in the theory of experiential learning, widely used in agricultural literature and explained by Kolb (1984) as "the process whereby knowledge is created through transformation of experiences". It follows an iterative learning cycle composed of four stages: concrete experiences, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). The concrete experience forms the basis for observation and reflection; with the experience one has the opportunity to consider what is working or failing (reflective observation), and to think about ways to improve on the next attempt (abstract conceptualization). Since practitioners´ knowledge is usually derived from experience and partially implicit, reflection of their own actions can help to make this knowledge explicit and to share it with other stakeholders. Explicit knowledge can again become implicit if it becomes incorporated into new procedures and 'ways of doing' (Restrepo et al., 2013).

> *As suggestion for improvement the demonstrator mentioned: 'Carrying out the treatments together.' (BE4)*

Additionally, working on real problems can also enhance the effectiveness of a demo.

> Mentioned as an explicit effectiveness characteristics*: Working with/calibrating a "real" (one of the farmers') equipment, which had its problems so we worked on real problems and discussed solutions. (GR1)*

Apart from the specific activities, it is important to find a good combination and balance between activities, more specifically between activities focused on theoretical or practical learning. Long (2004) recognises there is no such thing as a 'stereotypical' adult learner. Taking account of the variation in learning capacities and learning styles of individual farmers and their diversity of knowledge and skills (Millar and Curtis, 1997; La Grange et al., 2010) is an important part of enabling learning. This could for example be achieved by using different styles of learning activities. Throughout the case studies, a popular combination consisted of a technical presentation with a field walk or other activities on the field.

2.6.3 Create a stimulating setting

2.6.3.1 Facilitator role

Social learning advocates an interactive (participatory) style of problem solving with outside intervention taking the form of facilitation (Leeuwis and Pyburn, 2002). This supports the method of appointing a facilitator during (a part of) the demonstration event. Leeuwis (2004) summarises the facilitator's tasks as a) to facilitate the group process, b) to teach and c) to be an expert on technical aspects of farming. Facilitators should foster active listening, learning and questioning by providing (confrontational) feedback, raising questions, stimulating people to talk, as well as translating and structuring information, and educating/training, depending on their remit (Leeuwis, 2004). 3 workshop reports mentioned the importance of a trusted and neutral facilitator.

> *To have a professional facilitator can also be important for a good dialogue. It may also be that person who is able to pick up questions and comments from visitors, or the one who challenges or provokes in a nice and interesting manner. (DK-SW WR)*

2.6.3.2 Setting

To be able to facilitate learning, the space where the interaction happens should be well-considered. This was mentioned during the GM5 meeting, but also stressed in the extensive extension programme design guide 'Over the fence', published by the Ministry of Primary industries in New Zealand (2015). Everybody should be able to comfortably listen to and understand the speaker(s). This includes the arrangement of the location setting (linked to 2.3.2), but also the language and jargon used. Splitting up large groups into smaller groups with each a facilitator is preferred to have an engaged discussion.

Making the setting feel more informal could also work to facilitate interaction between attendees and open up communication (Schneider et al, 2009; Ministry of Primary Industries, 2015). This is in line with findings that for farmers, informal learning sources in the form of experts, observation and experience, and other farmers were the most frequently used learning sources for change (Kilpatrick & Johns, 2003). In more general workplace learning theory 'it is increasingly recognised that frequent informal conversations with individuals and small groups create good settings for preparing people for coming issues, listening to their problems and concerns, seeking their advice, asking them to consult others about a problem and come back with suggestions etc.' (Eraut & Hirsh, 2007).

Gonczi (2004) also highlights the importance of the setting/environment of learning activities. The farm provides much of the motivation for farmers. Therefore, the demonstration activity should link to/match this setting/context as much as possible, and not trying to hide failures or the negative attributes of a certain farming method. This also links back to 2.3.5. Sharing what went wrong is also mentioned in 5 of our case study reports as a strong learning opportunity for attendees.

> *Different scenarios with mistakes, wrong handling and "savings" were presented and appreciated by participants. (GR3)*

2.6.4 Didactic materials

This refers to all materials used during a demo to facilitate learning as didactic materials. This includes posters, hand-outs, booklets, videos, material used to show an experiment, shown machinery, interactive electronic voting systems to improve engagement of more introvert attendees and so on.

Leeuwis (2004) cautions that visual tools should not be regarded as an end in and of themselves. Visual tools can help to put issues on the agenda for further discussion and debate, however without further discussion and debate visual diagrams are not likely to lead anywhere (Leeuwis, 2004). Despite of this, visualisation of the content of the demo is mentioned as a key to an effective demo by 12 of our case studies. This ranges from 'seeing machines working in the field' to the use of 'giant clear posters' including the request to make more use of these posters. This clear visualisation is fundamentally what an on-farm demonstration is about.

> *Written information ("field guide") is also an important tool for effective farmer to farmer learning. Especially for young farmers videos on platforms, showing successful management practices play an outstanding role. Webinars with chat discussions were mentioned too as one possible element for enhancing peer to peer learning. (AT WR)*
>
> *Machinery exhibitions may attract even more farmers and serve as an incentive for them to visit a demonstration activity. (AT WR)*

2.6.5 Time management

Sticking to the communicated time schedule during a demonstration event is brought up by 5 case study reports as an effectiveness characteristic. In a few case study reports, there were complaints on not having

enough time available in the end for questions and discussions. To avoid this, someone could take up the role of time manager.

> *The participants seemed interested in the demonstration, but everything was a bit rushed, since there was very little time for each presentation. This also meant that there was very little time for questions and no time for discussion. (DK1)*
>
> As a key for effectiveness: *The demonstrator kept the day to schedule and guided the discussion well. (UK1)*

2.6.6 Plan vs. practice: handling unforeseen circumstances

A common unforeseen circumstance related to demonstration events is the weather. When the weather circumstances are too bad to have the event as planned, one option is to cancel the demonstration. Another option however is to have a back-up plan ready in advance. This can include lively presentations, films, any type of demonstration or discussion set-up possible in a sheltered setting or any other activity that supports the attainment of the goal of the demo.

Apart from bad weather, there could be other unforeseen circumstances to take into account while planning the demo.

> *I have to prepare information material or presentations, take time for the events and think about the programme depending on the weather. (Host farmer) (AT2)*

2.7 Follow-up and Evaluation

Evaluation refers to any feedback on the demonstration event that can be taken into account to improve related demonstration activities, and to be aware of how attendees perceived the actual demonstration event, and is as such valuable for both organisers and funders. Follow-up refers to the continuation of the development and spreading of the content of the demonstration, after the event is over.

2.7.1 Planning

To ensure qualitative follow-up and evaluation, planning both in advance is required and should preferably be linked to the goal of the demonstration. Decisions need to be made on the aim and collection method, and a responsible person needs to be identified for follow-up and evaluation.

> *When you show research, you want to share the results. When it was mainly a nice day out, you want to share a short impression video and something to remember after the demonstration day. (NL-BE WR)*

2.7.2 Activities

Evaluation activities could be formal, using for example exit surveys or arranging a stakeholder meeting afterwards, or informal, through for example verbally asking some general feedback comments at the end of the demo. The choice for one of these activities is strongly related to the aim of the evaluation.

Follow-up activities could also be formal or informal. Respectively, examples are organised follow-up demo events or informal telephone contact with other attendees or demonstrator.

> *Follow up activities are important, as publications or progressive events. Demos can be effective when they are part of a journey/progression – farmers attending one event, should have the opportunity to follow up with more focused events. (UK WR)*

2.7.3 Materials

There are multiple possibilities in materials to use to facilitate follow-up and evaluation. Deciding on which one(s) to choose is related to the targeted impact. Examples are: exit surveys, sharing of contact information of the demonstrators or of all attendees, a monitoring instrument used throughout the course of the demo event, information leaflets and a report or video of the demo posted and shared online afterwards. These materials support the learning process of the organising parties and/or the attendees.

> Illustratively as mentioned in the analytical framework: *The design of mediation and communication tools, such as farmer-presented instructional videos or farmer-written blogs can amplify the effectiveness of extension activities and confer a number of benefits. For example, Gandhi et al. (2007) recognize how the 'excitement' of appearing in participatory instructional videos motivated local farmers and their communities and reduced the 'distance' between farmers and the 'experts'.*
>
> *Providing virtual demos to those who cannot attend offers information and may act to attract participation next time. (UK WR)*

2.7.4 Influence on next demo

Will there be a next demo event? How will the planned evaluation and/or follow-up methods influence the next demo event? What is the aim in the long run? What and how can we learn from this demo to enhance our next demo? These are important questions to address when planning the evaluation and follow-up methods.

3 Methodology for determining potential key characteristics

3.1 Data sources

The cross-case analysis was performed on a dataset gathered as described in the *methodological guidelines for data gathering and analysis (D3.1-4.1-5.2)*. The data used for the cross case analysis presented in this deliverable, consisted of 65 semi-structured interviews which relate to case studies as a whole; and 31 completed observation tools, 351 post surveys filled in by attendees and 28 pre and post surveys filled in by demonstrators, relating to specific demonstration events (Fig. 2). These data sources are related to 35 case studies, as summarised in the *Case study reports (D3.2-4.2-5.3)*. Additionally, 8 reports on validation workshops with stakeholders added information to the analysis.

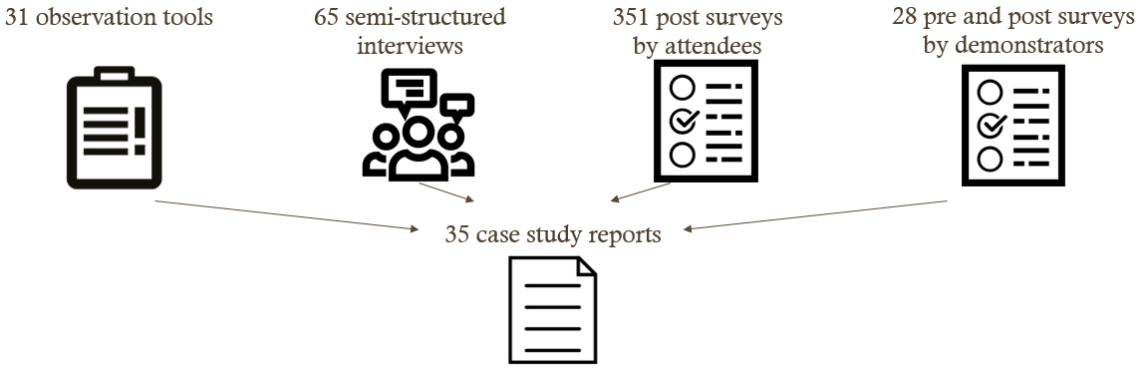

Figure 2: Data input for the cross-case analysis

3.2 Data analysis

3.2.1 Developing a long list of criteria

Data was analysed following an iterative approach (Fig. 3). We started from the key characteristics described in the analytical framework of AgriDemo-F2F (Koutsouris et al. 2017). Two researchers thoroughly screened the case study reports at least twice, identifying several potentially new key characteristics, emerging from the analysis, thereby adding to and refining the list of potential key characteristics. This resulted in a long list of 79 characteristics.

3.2.2 Structuring and selecting key characteristics

Starting from the analytical framework (D2.3), where the original division of key characteristics was structured in structural (WP3), functional (WP4) and learning (WP5) characteristics, we found that a lot of characteristics could be allocated to more than one of these three main aspects, leading to difficulties in the classification of some of the characteristics. To be able to come up with a clear and structured list of key characteristics, we decided to use the following criteria for restructuring the long list of 79 characteristics. First, we merged characteristics too similar in description and coding. Second, characteristics for which there was no clear data available for more than half of the case studies were excluded. Third, we specifically looked for key characteristics that seemed to influence the outcome variables.

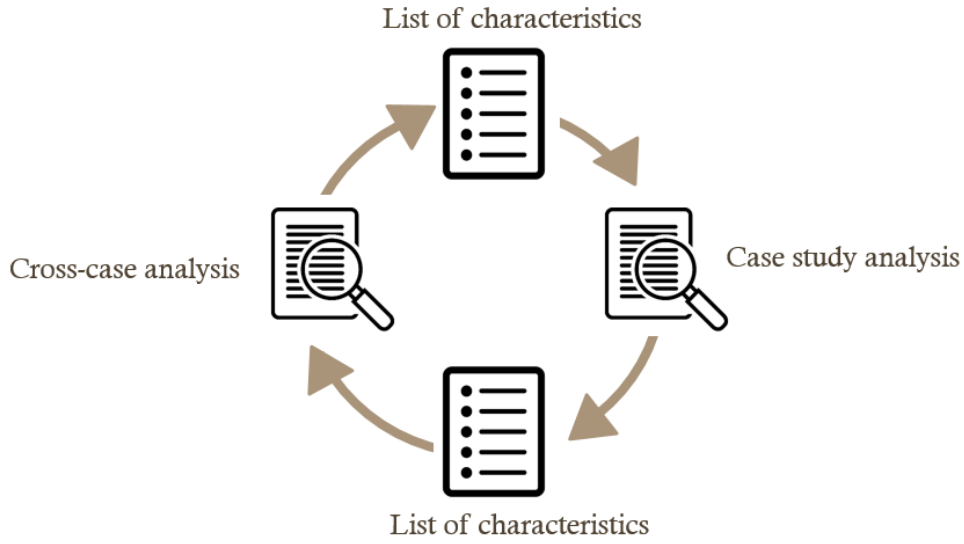

Figure 3: Iterative approach

3.2.3 Qualitatively scoring the key characteristics

In a next step, all characteristics were colour-coded or 'scored' for each of the case studies. This scoring was done in a qualitative way, explaining for each characteristics the reasoning behind the colour-code. The colour codes, although red-orange-green did not necessarily relate to any specific judgement, i.e. green is not necessarily better than red. In the same overview it was also determined if the variable was clearly mentioned as a key characteristic in the case study (Fig. 4).

	Attributes	Green/Red	How?	Mentioned as key?
Attendees pay an entrance fee at the demo	yes (green) - no (red)			
Host farmer received compensation	yes (green) - no (red)			
The demo is externally funded	yes (green) - no (red)			
The demo is part of a series of demo's	yes (green) - no (red)			

Figure 4: Qualitative colour-coding approach

To create more insight in possible links between the various characteristics and the effectiveness outcomes and to understand better which (combination of) characteristics support effectiveness of a demo in a certain context, we developed the following approach.

First, we defined a set of effectiveness outcome variables. As described in D5.2, we determine the effectiveness of learning based on two main elements, i.e. the extent and the nature of learning. For each of these two dimensions, we selected a number of variables, offering us insight on this specific dimension. Data for these variables was in this stage collected in the post-demonstration surveys of the participants.

Related to the extent of learning, we selected 2 main variables. The first one is 'individual learning' of the participants, assessed in the survey by the following question: "Have you learned something new?". This variable was coded green if more than half of the surveys completed by participants of the demonstration event stated 'yes' on this question. As a second variable, we included the overall effectiveness rate

surveyed participants attributed to the demonstration event. If the average score was more than 3,9 on 5, rated on a 5-point Likert scale, the demonstration event was coded green. Demos with an average score between 2,9 and 3,9 were coded orange, and below 2,9 they were coded red. Additional data including insights on the extent of learning, covering adoption and diffusion, was collected through the telephone surveys collected from participants between 3-6 months after the event (still under analysis). Related to the nature of learning, we focused on the reported occurrence of different levels of learning and key elements of peer-to-peer learning. Therefore, we opted to include 3 main variables: if participants on average for each demo event 1) felt actively involved; 2) felt like they could share their own background knowledge and 3) reflected on their own point of view at some point during the demo. These variables were scored in the same way as the 'individual learning' variable.

Combining the qualitative scoring of the characteristics with the scores of the effectiveness outcome variables enabled us to find patterns of characteristics (and possible combinations of characteristics) leading to more positive effectiveness outcome variables across specific demonstration events of all case studies . In Figure 5, an example is presented, showing the influence of group size. In most of the cases where they had a small group size or divided the group into subsets of smaller groups, higher scores were given by surveyed participants for the effectiveness outcomes variables. While this does not prove the link between the characteristic 'group size' and effectiveness outcomes, definitely not on individual case study level, this approach does offer us a tool to look for interesting stories within the data and gives indications on which (set of) characteristics might be key in organising effective demonstration activities.

CASE STUDIES	Knowledge exchange	Active involvement	Self-reflection	Individual learning	Effectiveness rate	group size	split in groups
	yes (green)=> 51% answers	yes (green)= >51% ans	yes= >51% answe	yes (green)= >51% ans	(1, 2 <3: red; 3 - < 4: ora	small =1-20; medium= 21-50; larg	
AT2 – rating	green	green	green	green	green	small	small
BE3 - rating	green	green	green	green	green	medium	medium
BE4 – rating	green	green	green	green	green	small	small
FR3 – rating	green	green	green	green	green	small	small
GR1 – rating	green	green	green	green	green	large	large
GR3 – rating	green	green	green	green	green	small	small
IR2 – rating	green	green	green	green	green	small	small
PL1 – rating	green	green	green	green	green	small	small
PL2 – rating	green	green	green	green	green	medium	small
FR1– rating	green	green	green	green	Orange	large	small
FR2 – rating	green	green	green	green	green	large	medium
PL3– rating	green	green	green	green	green	large	small
SE1 rating demo 2	green	green	green	green	green	medium	small
SP1 - rating	green	green	green	green	green	small	small
SP2 – ratinG	green	green	green	green	green	small	small
SP3 – rating	green	green	green	green	green	small	small
UK1 - rating	green	green	green	green	green	small	small
UK2 – rating	green	green	green	green	green	medium	medium
IR1 – rating	red	green	green	green	green	medium	medium
AT1 – rating	green	green	green	green	Orange	large	small
DK3- rating	green	green	green	green	Orange	small	small
SE1 – rating + dem	green	green	green	green	Orange	medium	small
SW1 - rating	green	green	green	green	orange	large	small
SW2 – rating	green	green	green	green	orange	medium	medium
NL3– rating	green	green	green	green	Orange	large	small
DK1- rating	green	green	red	green	Orange	large	medium
BE2 – rating	orange	green	green	green	orange	large	large
IR3 – rating	red	green	green	green	Orange	large	medium
NL1 – rating	red	green	red	green	Orange	medium	medium
BE1 - rating	green	red	green	green	red	medium	medium
NL2 – rating	green	green	green	red	Orange	large	small

Figure 5: Example of cross case comparison of outcome variables and group size

3.2.4 Validation steps

We undertook several actions to validate both the case study data, gathered as described in the methodological guideline, and the various analytical steps.

First of all, the case study findings as summarised in the reports were presented during 10 workshops, covering 12 partner countries. During these workshops the central aim was the validation of the findings of the individual case studies and the identification and the validation of key characteristics for effective on-farm demonstrations/ best practices. Partners were responsible for writing reports on the workshops. These workshop reports were taken into account during the listing and structuring of the key characteristics.

Connecting case study and workshop data with potential key characteristics was done by 2 researchers from ILVO who discussed uncertainties about interpretation of the qualitative data with each other during the whole process.

After connecting the data from the case study reports to the list of characteristics, these two researchers created a Google form for partners to cross check info they found in the case study reports that was still open for interpretation or was not yet described sufficiently clear.

From the 22nd until the 24th of January, all partners of AgriDemo-F2F met in Nantes for the 5th General Meeting. During this meeting, all partners got the opportunity to revise in-depth a first structured list of key characteristics, prepared and presented by researchers of ILVO. Based on this validation step in Nantes, where the key characteristics in 5 main categories were discussed, we further subdivided, resulting in 7 main subcategories of characteristics (detailed under 2. Overview of key characteristics).

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5 ANNEX I

Table I : List of topics reported in case studies on farm demonstrations

	Topic	No of cases topic reported in
1	Machinery/equipment	9
2	New varieties/cultivars	8
3	Organic farming	5
4	Plant protection	4
5	Crop rotation	4
6	Software for farm management	4
7	Infrastructure (barns; stables; biogas station)	4
8	Controlled farming traffic tools/gps control of tractors	3
9	Sowing	2
10	Fertilization	2
11	Weed control	2
12	New pests	2
13	Agroforestry	2
14	Co-cultivation	2
15	Precision farming	2
16	Sensors	2
17	Animal/dairy products	2
18	Marketing/access to markets	2
19	Animal disease	1
20	Grassland management	1
21	Drought prevention	1
22	Water management	1
23	Natural pollination	1
24	New fertilizers	1
25	Feed	1
26	Pest traps	1
27	Stockless farming	1
28	No tillage	1
29	Buffer zones	1
30	Farming in balance (OiB)	1
31	Drone filming	1
32	Post harvest processes	1
33	Breeding	1
		Total 75

Table II

Type, level and degree of innovation demonstrated in case studies' events(X verified, E=Estimated, N.D=No data, N.A=not applicable), *data for French case studies not validated

Country/CS	Topic	Type/level of Innovation						Degree of Innovation				
		Product	process	organizational	Single	Package	composite	Incremental	radical	Novelty	In between	Well established
AT 1	Fertilization, plant protection, weed control, showing density, different varieties trials ion different species	X	X			X		X				X
AT 2	Stockless (roller-crimper no-tillage fields), crop rotation and catch crops	X	X				X	X		X		
BE 1	Agroforestry-alley cropping	X	x	X			X		X	X		
BE 2	Controlled Traffic Farming (CTF) in organic farming	X	X		X			X			X	
BE 3	Innovative breeding and producing milk: Machines/equipment/ infrastructures, software	X	x			X		X			X	

BE 4	Organic cultivation and traditional/indigenous varieties of apples	X	X	X		X		X			X	
DK1	Roughage for organic milk cows. Subtopics: Plant protection, weed control, different varieties,cuttings (maize, rye, clover) & machinery/ equipment exhibition	X	X			X		X			X	
DK2	Organic arable production	X	X			X		X			E	
DK3	Intelligent buffer zones		X				X		E	E		
*FR 1**	*Cow's feed, stable building (a new barn), robot and grazing*	*X*	*X*				*X*		*E*		*E*	
*FR 2**	*Tomatoes and beans mix cropping to avoid aphids and mites damage* *Organic fertilisation by alfalfa* *Movable greenhouse* *New varieties: tomatoes, pepper, zucchini* *Connected weather station Sencrop* *Experimentation to reduce pesticides* *Organic material: string, mulching…*	*X*	*X*			*X*		*E*			*E*	

	Equipment demo Toutilo *Robot demo*											
*FR 3**	*Heifers' parasitism management*		*E*		*N.D*			*N.D*		*N.D*		
GR 1	Alternative spraying tools/equipment (use, calibrating, etc.); handling of pesticide containers; farmers' health protection measures and environmental protection	X	X			X		X				X
GR 2	No event				N.A							
GR 3	Production of a Greek traditional semi-hard cheese		X			X		X				X
IR 1	Organic cereal production and on – farm processing practices	X	X			X		X				X
IR 2	Agroforestry	X	X				X		X		X	
IR 3	Beef production (cross breeding, production data, measurement and management)	X	X			X		X				X
PL 1	Arable crop production - mixtures of cereals and pulses. (different varieties, density of sowing, crop mixtures, plant protection and	X	X			X		X			X	

	drought prevention trials)											
PL 2	Maize production and the decision support system concerning plant protection.	X	X			X		x			x	
PL 3	Specialized organic vegetable production	X	X			X		x			x	
SE 1a	Precision Agriculture	X	X			X			X			X
SE 1b	Precision Agriculture	X	X			X			X			X
SE 2	No event	N.A.										
SP 1	Organic dairy production and manufacturing processes	X	X	X		X		X				X
SP 2	Smart farming applications on a pig farm (monitoring, control and management of farm's resources	X	X	X		X		X				X
SP 3	Pistachios crop	X	X			X			X			X
SW 1	Farming In Balance concept (Winter wheat, canola, biogas and slurry management, production of ley seed)	X	X				X	X			X	
SW 2	Farming in Balance concept (Arable production and	X	X				X		X	X		

	multifunctional buffer strips)											
SW 3	Water management and techniques to reduce/avoid contamination from fertilisers and pesticides-Buffer zones	X	X				X		X	X		
NL 1	Precision farming focused on arable farming	X	X				X	X		X		
NL 2	Greenhouse Production (Pepper and Energy-management)	X	X				X	X				X
NL 3	Vertical ventilation system (strawberry)	X	X		X				X	X		
UK 1	Weed control (alternatives to glyphosate)		X		N.D				X	X		
UK 2	Managing black grass in barley on heavy soils		X		N.D			X			E	
UK 3	No event	N.A.										
Total												