



Project Number: 652654

Project Acronym: OK-Net Arable

Project title: Organic Knowledge Network Arable

Periodic Technical Report

Part B

Period covered by the report: from 01/09/2016 to 28/02/2018

Periodic report: 2nd

1. Explanation of the work carried out by the beneficiaries and overview of the progress

1.1 Objectives

The overall aim of 'OK-Net Arable' was to increase productivity and quality in organic arable cropping by improving the knowledge exchange among farmers, farm advisers and scientists.

To achieve this, the project had three objectives:

1. synthesize existing knowledge about organic arable farming and identify the best ways for exchanging this knowledge. Based on this, advisory material that is easy to use was collected and developed.
2. create a European network of farmers to exchange experiences and discuss the selected advisory material.
3. create an online platform to make the advisory material available for a wide audience of farmers and advisers and facilitate farmer-to-farmer learning across Europe.

The work carried out towards the achievement of the three specific objectives during the second reporting period is summarised in Table 1.

Table 1: Summary of work carried out, milestones and deliverables achieved in second reporting period

Specific objective	Work carried out (summary)	Milestones achieved	Deliverables achieved
Synthesize existing knowledge, collect and develop advisory materials	Based on feedback from the farmer innovation groups, criteria for selecting tools and advisory materials were simplified. In total 94 tools have been collected. In addition, OK-Net Arable partners made new tools (practice abstracts and videos), or adapted and translated existing tools. At the end of the process, 139 tools were collected or made. This includes 26 videos, 37 leaflets/guidelines, 9 calculation tools, 19 web-based tools, 1 power-point presentation, 4 books/reports and 43 practice abstracts. English and German are the main languages of the tools, but also French, Italian, Dutch, Danish, Bulgarian, Hungarian, Spanish, Polish, Greek and Swedish are represented. Several tools are in more than one language.	At the occasion of the project meeting in Udine (25-27/01/2017), a new batch of materials was added on the knowledge platform (MS11). At the same meeting, workshops were held with farmers of the farmer innovation groups to get their feedback on first practice abstracts, as well as videos produced by project partners (MS12). The knowledge and advisory materials collected in the project were used to develop on-line courses. The first facilitated online course was completed on 30/06/2017 (MS15)	The process of collecting and developing the tools (advisory materials) from the start until the end of the project is described in deliverable D3.3 - Collection of end-user material. All tools have been submitted to the EIP-AGRI database in the common EIP-AGRI format (deliverable D4.5 - practice abstracts). An overview of the two facilitated on-line courses and the self-learning course is provided in deliverable D4.2.
Create a European network of farmers to exchange experiences	The OK-Net Arable project worked with 14 farmer innovation groups in 10 countries that represented a range of farm types. In the second reporting period the exchange between the groups and between the farmers taking part in the groups was intensified through 2 European farmer workshops and 7 exchange visits. Farmer innovation groups were invited to carry out some practical testing of specific practices that addressed the issues identified by them. In total, 11 practical trials were carried out. Topics chosen focused either on weed control, or soil fertility and nutrient management tools	A summary of the findings of the farmer workshops held in each country to evaluate the first offer of tools/advisory materials was given at the meeting in Udine (25-27/01/2017) (MS10). At the workshop in Valence (19-21/09/2017), farmer innovation groups reported about (first) outcomes and shared experiences from their practical testing (MS13). Two European workshops and 7 exchange visits were organised, the last one in Valence (MS14).	Findings of the national farmer workshops have been summarised in deliverable D2.2 - Evaluation of the usefulness of tools and end-user materials to farmers; and deliverable D2.3 From farm to forum: Exploring opportunities to develop on-line knowledge exchange for organic arable farming. D2.3 has been submitted as scientific paper. Based on input from the farmers and academic partners, deliverable D2.4 provides recommendations regarding topics for a common research agenda for organic arable farming and for methodologies to co-create common research agendas.
Create an online platform for knowledge exchange	The farmknowledge platform, with toolbox and discussion forum, was launched on 03/10/2016. It is available in 10 languages. Since the launch of the platform, the platform has been developed further according to suggestions from project partners and other users: For example, a "farm news" page was added with reports of the practical testing activities.	The outcomes of the OK-Net Arable project, including the knowledge platform, were presented at the final conference on 15/11/2017 (MS16)	A description of the knowledge platform at the time of launch is provided in D4.1. How the tools and advisory materials have been uploaded and are presented on the knowledge platform is described in D4.3. An evaluation of the knowledge platform and a plan for its continuation is available in D4.4.

1.2 Explanation of the work carried per WP

1.2.1 Work Package 1 - Project coordination and representation

The overall aim of this work package was to coordinate the project effectively and efficiently, to ensure efficient and effective communication among the project partners and with the Research Executive Agency and to make policy makers aware of the project.

Task 1.1: Project coordination

Lead Partner: IFOAM EU

Partners involved: FiBL, PFT Ltd/ORC, BBG, AIAB, ICROFS, ITAB, Estonian Organic Farming Foundation

This task mainly involved the coordination and chairing of the Steering Committee, which was responsible for supervising and monitoring all relevant aspects of the project. The Steering Committee was composed of the partners listed above. The Steering Committee has met almost each month, except during the summer period, at following dates: 12/09/2016 (conference call), 11/10/2016 (Brussels, Belgium), 16/11/2016 (conference call), 14/12/2016 (conference call), 27/01/2017 (Udine, Italy), 14/03/2017 (conference call), 03/04/2017 (conference call), 03/05/2017 (conference call), 09/06/2017 (conference call), 15/11/2017 (Brussels, Belgium), 18/12/2017 (conference call), 19/01/2018 (conference call), 22/02/2018 (conference call)

In between Steering Committee meetings, IFOAM EU had intensive email exchange and conducted conference calls with individual WP leaders, WP co-leaders and project partners in order to follow-up and guide implementation of the project.

Task 1.2: Internal communication

Lead Partner: IFOAM EU

Partners involved: all

In the second reporting period, two project meetings have been held, namely on 25-27 January 2017 in Udine (Italy) and 14-15 November in Brussels (Belgium). The meeting in Udine was combined with an exchange visit for the farmer innovation groups, while the meeting in Brussels was combined with the final project conference. The minutes of the meetings are available in deliverables D1.5 and D1.6 respectively.

Task 1.3: Quality management and reporting

Lead Partner: IFOAM EU

Partners involved: all

IFOAM EU has coordinated the preparation and submission of all deliverables. This included ensuring high-quality of the deliverables and avoiding overlap between them.

In order to adequately monitor the spending of the budget, IFOAM EU has required that project partners provide internal financial reports in addition to the mid-term and final financial reports due for the REA: a report for the period January 2016-December 2016 (by 28 February 2017) and a final budget forecast until the end of the project by 3 December 2017.

Finally, IFOAM EU maintained the contact with the project officer at REA.

Task 1.4: Relations with policy makers

Lead Partner: IFOAM EU

Partners involved: all

First, IFOAM EU got the chance to present OK-Net Arable to the representatives of Member States in the SCAR-AKIS working group at their meeting of 27 March 2017 in Bratislava (Slovakia). This working group is a body of the Standing Committee on Agricultural Research (SCAR) and deals with Agricultural Knowledge and Innovation Systems. It is an important body for Member States to reflect and advice the European Commission on the implementation of EIP-AGRI.

Secondly, IFOAM EU presented OK-Net Arable to the Civil Dialogue Group on Environment and Climate Change at the meeting on 10 November 2016. This Civil Dialogue Group is one of 13 providing the European Commission advice on matters relating to the Common Agricultural Policy. Thirdly, OK-Net Arable took part in the “Thematic Networks meeting” organised by COPA-COGECA on 3 February 2017. The aim of this meeting was for thematic network coordinators to learn from each other and exchange best practice. It was attended by representatives of the European Commission and members of SCAR-AKIS.

Fourth, OK-Net Arable was present at the EIP-AGRI workshop “Organic is Operational” on 14 June 2017 in Hamburg (Germany) that was attended by several national authorities responsible for implementation of Rural Development Programmes and EIP-AGRI Operational Groups. The aim of this workshop was to promote exchange between Operational Groups, thematic networks and other multi-actor project dealing with organic farming. Finally, the outcomes of OK-Net Arable were presented to policy makers, stakeholders, scientists, companies and farmer representatives at the final project conference on 15 November 2017. The final conference was organised as part of the 3rd edition of the Organic Innovation Days. In addition, OK-Net Arable was also present at 2nd edition of the Organic Innovation Days on 6 December 2016. One of the solutions tested by the practice partners, namely the “SEMINBIO®: Innovative sowing machine for weed control in cereals” tested by Con Marche Bio, was the winner of the call for innovations in the theme “Increasing productivity and quality in organic arable farming”. The Organic Innovation Days are a yearly event organised by TP Organics and targets policy makers, farm and industry representatives, NGOs and researchers.

The experiences gained in OK-Net Arable were taken into account in the policy work of IFOAM EU, in particular through participation in the permanent Subgroup on Innovation for Agricultural Productivity and Sustainability, and through the work of TP Organics in meetings with the Directorate-General for Agriculture and Rural Development, the Directorate-General for Research and Innovation, FACCE-JPI and ERA-Net CORE Organic

More information about the communication and dissemination activities by all project partners is reported in section 1.2.4 (task 4.5)

1.2.2 Work package 2 - Facilitation of testing with farmer innovation groups

The overall aim of this work package was to form an international network of existing regional farmer innovation groups and to better understand the success factors that make end-user and education materials effective and useful in a practical context.

Task 2.1 Establishing the international network of farmer innovation groups

Lead Partner: PFT Ltd/ORC

Partners involved: BBG, FiBL Projekte, ÖMKI, Estonian Organic Farming Foundation, Bioforum, ITAB, VFL P/S (now SEGES), Bioselena, FiBL AT, ConMarcheBio

The aim of this task was to co-ordinate the interaction and exchange between the national /regional farmer innovation groups to ensure good and constructive communication.

The OK-Net Arable project worked with 14 farmer innovation groups in 10 countries that represented a range of farm types. A summary of the farmer innovation groups descriptions was provided in deliverable D2.1 “Description of the farmer innovation groups”.

In the second reporting period the exchange between the groups and between the farmers taking part in the groups was intensified through 5 internal newsletters that were sent to practice partners providing updates of the project of interest to the farmer groups, through farmer workshops and exchange visits. Some news about the exchange events was also shared on social media.

There was lots of positive feedback from farmers on the exchange visits and an appreciation for the opportunity to exchange with peers from across Europe. They suggested that more similar events should be arranged in future and many felt they were willing to pay their costs if the organisations were willing to coordinate the exchanges.

Two farmer workshops

An exchange visit and workshop for the farmers of the farmer innovation groups was organised back-to-back with the project meeting in Udine (Italy, 25-27/01/2017) by AIAB, ORC, ICROFS, FiBL and IFOAM EU. Participants visited a farm and exchanged about machinery for soil and weed management, cover crop choice and combining organic farming with minimum tillage. ORC facilitated a session aimed at identifying what farmers would like to ‘share’ (such as novel practices, experiments and trials, successes) and what they would like to ‘learn’ from other groups. The suggestions were grouped into themes (intercropping and cover crops; soil health; weed management; sowing and managing novel crops; and whole farm management) and informed the planning of exchange visits (see below). The workshop also served to get feedback from the farmers on the first practice abstracts produced by the project (session chaired by FiBL and AIAB), and videos (session chaired by FiBL).

The final exchange visit and workshop for the farmer innovation groups, jointly organised by ITAB, ORC, Bioland and IFOAM EU, took place in conjunction with Tech&Bio in Valence, a French organic agricultural show (19-21 September 2017). The visit and workshop were attended by 52 participants. The exchange included two parallel farm visits, one no-till field trial and one innovative organic farm, with exchanges between groups on the key insights emerging. Co-development workshops enabled the farmer innovation groups to share experiences from their practical testing and discuss questions with peers from other countries. A workshop was also held to discuss farmer perceptions and thoughts regarding online knowledge exchange (see D2.3) and the farmknowledge.org platform (see D4.4). This was followed by attendance to Tech&Bio, conference on organic and low input farming, with insight into innovation in organic farming from across Europe. OK-Net Arable delegates presented posters on practical testing experiences in the International Pavilion. The conference offered the opportunity to exchange with delegates from beyond the OK-Net Arable network.

In the field events and exchange visits

In total seven exchange visits were organised, where the practice partners invited farmers from their own and/or other countries to visit and see for themselves the results of some of the

practical experiments or take part in field and farm demonstrations. On top of the 2 visits mentioned above, the following visits were organised:

A group of **Belgian farmers** visited **SEGES** to learn about organic farming in Denmark in September 2016 and met with Danish farmers and advisors to learn about their organic cropping and farming practises. See video report of the visit on the OK-Net Arable YouTube channel [here](#).

Demonstration of Mechanical Weed Control, Belgium. **INAGRO** demonstrated machines for mechanical weed control in cereals (31 March 2017) for a group of 20 organic farmers: a classic tine harrow (Carré), a precision tine harrow (Treffler), a rotary hoe (Carré) and a rotary harrow (Einböck). With some 20 organic farmers they discussed the machines and their effectiveness in the field, which was followed by weed counts (see below).

No-till demonstration, Austria. **FiBL Austria** hosted an event on organic no-till and regenerative agriculture in Absdorf, (24-26 April 2017). Key topics covered were Roller-Crimper, Organic No-Till method, presented by Jeff Moyer (from the Rodale Institute, Pennsylvania, USA). The day included a farm visit and presentations on soil health, agroforestry earthworms/vermicomposting and cover crops, attended by farmers from Hungary, Italy, France and Denmark. The farmers enjoyed seeing a roller-crimper in action and were inspired to try new practices at home. The fact that the learning was farmer-to-farmer based was especially appreciated

Intercropping field day, UK. **ORC** hosted a visit on an organic farm in Suffolk (6-8 June 2017), bringing together the OK-Net Arable group with other English and French (ITAB) farmers and researchers. The day included experiences with relay cropping (buckwheat and oats/peas), undersowing and companion cropping (camelina and oats), the use of Cameleon combi drill system at Shimpling Park Farm and a visit to Wakelyns Agroforestry.

Roller Crimper demonstration, Italy. **AIAB** hosted a visit from the farmers from ConMarcheBio (12 July 2017) to the practical trials with terminating cover-crops and using the roller crimper in the Friuli region, carried out by them. The farmers saw the trial results on a two-farm tour and had the possibility to see some field operations and exchange ideas about conservation agriculture techniques applied in organic farming in Italy.

Task 2.2 Monitoring framework of farmer innovation groups and data collection

Lead Partner: PFT Ltd/ORC

Partners involved: BBG, FiBL Projekte, ÖMKI, Estonian Organic Farming Foundation, Bioforum, ITAB, VFL P/S (now SEGES), Bioselena, FiBL AT, ConMarcheBio, AIAB

Completed in the first reporting period.

Task 2.3 Testing of innovative training and educational material in the farmer innovation groups

Lead Partner: PFT Ltd/ORC

Partners involved: BBG, FiBL Projekte, ÖMKI, Estonian Organic Farming Foundation, Bioforum, ITAB, VFL P/S (now SEGES), Bioselena, FiBL AT, ConMarcheBio

This task aimed at getting feedback from the farmer innovation groups about the suitability and relevance of innovative end-user and education material, (e.g. manuals, web-based tools,

interactive workshops etc.) and to understand reasons for acceptance and successful implementation.

The farmer innovation groups selected knowledge exchange tools (i.e. material suitable for the end-user) of the first offer of 30 tools, that had been presented to them at the project meeting in Newbury in April 2016. They were free to choose topics and tools from the list that they wanted to evaluate or could propose similar tools of interest to them. ORC proposed a common mainly qualitative approach for the evaluation of tools through two discussion workshops. The groups were also invited to propose and carry out some practical testing, for which they submitted proposals setting out what they wanted to test and how, which were reviewed and approved by the Steering Committee. Some details of both steps are outlined below.

Reasons for acceptance and successful implementation of practices can mainly be summarised as related to relevance of the knowledge and practice to the challenges of the specific system and to generating opportunities that allow farmer to judge for themselves whether the practice is suitable.

Regarding relevance, the results show that weed management and soil fertility & nutrient management were the two most important thematic topics that groups chose for tool feedback and practical trials. This corresponds well to the most common challenges reported by the groups in the previous reporting period (see D 2.1 Cullen et al., 2016). Regarding judging for themselves, important points made by the farmers related to the need for having information about the practical context of recommendations (for example by including case studies) and to including visual information. Also, the practical trials enabled to see for themselves by exploring or demonstrating the use of equipment, germplasm or a practice that had worked under different circumstances. For example, in Bulgaria and Belgium farmers were able to see the effect of weed control equipment, not commonly used in their country. The Danish farmers tried a machine to control docks in leys that was developed by an Austrian farmer for pasture. In Italy and Bulgaria roller equipment was tried, whereas the French groups tried different cultivars of clover for undersowing in cereals. However, these practical trials only lasted one season and many of the groups will not be able to carry on with similar demonstrations after the project has ended. The outcomes illustrate that knowledge sharing across Europe has huge potential for innovation leading to improved organic arable farming across Europe.

Tool evaluation through workshops

The feedback on tools was gathered in 22 workshops held across 10 countries during 2016. A first series of workshops in which farmer innovation groups evaluated 10 tools of their choice took place in summer 2016 (first reporting period). A second series of workshops in which each group selected 2-3 tools for a more detailed qualitative assessment took place in autumn 2016 (second reporting period). The findings of the workshops were summarised in two deliverables D2.2 and D2.3 (Bliss et al 2018 a & b). Both cover both the themes (such as soil and nutrient management, weed control, pest and diseases) and tool types (technical guides, websites, calculation or decision-support tools and videos). The second paper, D 2.3 (Bliss et al., 2018b) has been submitted as a scientific paper to the Springer Journal Organic Agriculture.

As a topic weed control was rated most highly, in particular tools on mechanical weed control, and ones comparing different machinery. Gaps were identified regarding the availability of tools about weed biology and those that focus on an integrated approach to weed control, which includes preventative and cultural control as well as direct methods

(mechanical weed control). Several groups tried weed control approaches in practical trials (see below).

For soil management, tools on soil monitoring, reduced tillage and cover crops were considered particularly interesting and relevant, whereas the tools related to pest and disease control were of lower priority, but this maybe a reflection on the tools offered rather than the importance of the topics. Many farmers feel that “*the best way to learn about something is to speak to someone who is doing it*” so the second paper (D2.3) explored whether lessons can be learned from that for taking knowledge exchange on-line. Feedback on a range of existing on-line knowledge exchange tools suggests that attention should be given to sharing farmer experience, visual information, details of the context, economics, successes and failures and practical implications.

Practical testing

The groups were also invited to carry out some practical testing of specific practices that addressed the issues identified by them. The groups submitted proposals that were reviewed by the Steering Committee and feedback was provided before the actual testing started. In total, 11 practical trials were carried out. Topics chosen focused either on weed control, or soil fertility and nutrient management tools. Six trials related to the use of machinery that was previously not used in the region or country, one trial looked at cultivars for cover crops and four tested various tools for diagnose of soils and rotation, including in field tests, use of a drone and a simulation model. The results of this practical testing-summarised here-have been reported by the farmer innovation groups in the form of practice abstracts and/or videos that are shared on the knowledge platform: <http://farmknowledge.org/index.php/farm-news>

1. Mechanical weed control demonstrations; Bioforum/INAGRO, Belgium

Following on from the use of different machines (see exchange visit above) weed counts (excluding the rotary harrow) were compared. Most effective in the condition of the trial (hard crust, sandy loam) were two passes of the harrow, or a combination of two passes of the rotary hoe followed by the harrow. <http://farmknowledge.org/index.php/knowledge-sharing-bioforum>

2. Demonstration of the comb harrow, Bioselena, Bulgaria

Bioselena organised a trial for testing the effect of harrowing of cereals on three cereals, wheat, spelt and einkorn. In the early stages, weeds with shallow roots were successfully eradicated and the presence of others (burdock, stork bill) was reduced. Yields increased by 13% for wheat, 17 % for spelt and 23% for einkorn. <http://farmknowledge.org/index.php/knowledge-sharing-bioselena>

3. Using the WUZI dock cutter in grasslands, SEGES, Denmark

In the grassland phase of the rotation, docks colonies are often present and can only be controlled with additional tillage. A dock-cutter was tested that terminates docks and prevents regrowth. Using the dock cutter was more convenient than forking- or digging-out docks, but time consuming. The group saw the potential of further innovation in self-driving robots. <http://farmknowledge.org/index.php/knowledge-sharing-seges>

4. The SEMINBIO® prototype seeder, Con Marche Bio, Italy

This new machine optimises seed distribution in the three axes of space. It was tested in durum wheat and found to ensure a fast soil cover by the crop, a rapid and improved uptake of nutrients, and enhanced competitive ability against weeds. It can be combined with other

weed control measures, such as a harrow comb.
<http://farmknowledge.org/index.php/knowledge-sharing-conmarchebio>

5. Use of the Roller Crimper; AIAB, Italy

Soybean is a challenging crop in organic systems due to its low ability to compete with weeds. The trial tested several methods of sowing soya into a mulch and found some of them to have good results in terms of weed control, preservation of soil water and yields. The effectiveness of a mulch depends on the amount of mulch biomass, but this can cause some difficulty for the planter. <http://farmknowledge.org/index.php/knowledge-sharing-aiab>

6. Roller crimper for terminating cover crops; Bioselena, Bulgaria

This no-till technology is so far only used at one non-organic farm. The group tried the roller crimper on two organic farms located in different climatic and soil areas. Results showed that no-till can work in organic farming in Bulgaria, but several years of trials would be necessary. The size and weight of machines and tractors might be limiting on small-scale organic farms. <http://farmknowledge.org/index.php/search-for-ok-tools?v=32605>.

7. Testing cover crop varieties; ITAB, France

Farmers in Central France tested different clovers undersown in cereals. One trial covered different white clover varieties and mixes in winter wheat, two other trials were not successful because of a wet spring. The successful trial showed interesting differences, when comparing dwarf with intermediate cultivars with one intermediate cultivar providing highest biomass. This highlights the important of variety testing also for fertility building crops. <http://farmknowledge.org/index.php/knowledge-sharing-itab>

8. Multi-spectral cameras for on-farm trial assessments; ÖMKI, Hungary

During the testing a drone was used for imaging field trials. The analysis of the remote sensing images allowed to determine weed infestation, field heterogeneity and SPAD (Soil Plant Analysis Development) and NDVI (Normalized Difference Vegetation Index). The NDVI data did not correlate well with traditional sampling results. <http://farmknowledge.org/index.php/knowledge-sharing-omki>

9. NDICEA - Nutrient management model; ORC Arable group, UK

A computer-based nutrient budgeting model (NDICEA) was used to assess individual field rotations on seven farms and identify where nutrient surpluses and deficiencies occur over the seasons and rotation cycle. In many cases, the model predicted potential loss of organic matter and encouraged the farmers to reflect on their planned rotations and soil cultivation practises. <http://farmknowledge.org/index.php/knowledge-sharing-orc>

10. Soil Assessment Methods; Bioland, Germany

The group explored several tools for soil assessment in their workshops and then opted for demonstrating a simple and quick test of water infiltration. It promotes an understanding of the effects of soil compaction and the importance of soil-conserving cultivation. The quick test is easy to understand and impressive for non-scientists and can be used in training event. <http://farmknowledge.org/index.php/knowledge-sharing-bioland>

11. Using spade test with farmers, ITAB, France

The French group carried out a demonstration of the spade test using a French description of the approach <http://farmknowledge.org/index.php/search-for-ok-tools?v=32099>.

Task 2.4 Reporting for research agenda recommendations

Lead partner: Bioland

Partners involved: PFT Ltd/ORC, Bioland, AU/ICROFS, IFOAM EU

This task resulted in D2.4 “Recommendations for a common European research agenda”. The report mainly brings together results from D2.1, D2.2 and D3.1 complemented by experiences made in the different partner countries and by inputs from national research agendas. It gives recommendations regarding topics for a common research agenda for organic arable farming and for methodologies to co-create common research agendas.

The report makes ten recommendations for research topics based on experiences made in OK-Net Arable, in particular from working with the farmer innovations groups. The topics are related to cropping systems and interactions, weed management, soil fertility and nutrient management and pest and disease control. Not all topics are equally relevant across the whole of Europe. For all topics, both fundamental and applied research is needed. The farmers taking part in OK-Net arable were interested in a better understanding of the systemic aspects of organic cropping systems as well as in applied solutions to specific problems. There also is a need for further opportunities for knowledge exchange between farmers and advisors in Europe.

1.2.3 Work package 3 - Synthesise research results, best practices and learning methodologies

The overall aim of this work package was to collect, state-of-the-art research results, technical solutions and best practices, to identify the best methods for learning and knowledge exchange among (and towards) farmers, researchers and advisers and to translate, adapt and develop end-user and education materials fostering the deployment of scientific and practical knowledge in the area of organic arable cropping.

Task 3.1 Collect state-of-the-art research results and best practices

Lead Partner: FiBL

Partners involved: FiBL, PFT Ltd/ORC, AIAB, FiBL Projekte

Fully completed in first reporting period.

Task 3.2 Identify best methods for learning and knowledge exchange

Lead partner: AIAB

Partners involved: EUFRAS, FiBL Projekte, PFT Ltd/ORC, AU/ICROFS

Fully completed in first reporting period.

Task 3.3 Identify and develop end-user, education and training material

Lead partner: AIAB

Partners involved: FiBL, AIAB, PFT Ltd/ORC, AU/ICROFS

The task took start from WP2 outcomes and task 3.1 and 3.2. The specific goal of Task 3.3. was the identification of specific tools to be adapted, translated or newly produced.

The identification and development of end-user, education and training material was carried out in three steps (for a detailed description see Deliverable 3.3).

1. A first offer of 30 tools was selected from a pool of 165 tools based on a set of criteria identified by the Steering Committee (meeting of 3 March 2016). The tools with the highest scores were included in the offer.
2. Based on the feedback from the Newbury meeting, the Steering Committee simplified the selection criteria and additional tools were entered. The total number of existing tools made available on the platform is now 94. 37 tools are available in more than one language.
3. The third offer of tools consists of the tools produced by the project partners as part of the project activities. This includes translations/adaptations of previously existing tools, as well practice abstracts and videos that were made to report on the practical testing activities. In total 28 tools were translated, of which 16 videos, 11 leaflets and 1 calculator tool; 43 practice abstracts were produced and 8 videos were made. A detailed description is available in Deliverable D3.3

The practice abstracts of OK-Net Arable are based on the common template provided by EIP-AGRI, but not the same. Project partners felt that the actual template of EIP-AGRI (in excel) is too limited. The possibilities for structuring the text are limited, and it is not possible to include pictures or graphical elements. Therefore, OK-Net Arable developed a 2-page template. The main elements of the common template have been maintained (problem, solution, outcome and practical recommendations). But an “applicability box” with guidance on the conditions in which to apply the practice, as well as instructions for testing and sharing the practice have been added. A comparison of the elements of the EIP-AGRI practice abstract and the OK-Net Arable practice abstract is included in Deliverable D4.3.

All collected tools and all tools that were produced as part of the project, are available on farmknowledge.org and searchable by tool type, language, theme and other criteria.

1.2.4 Work package 4 - Knowledge platform and communication

The overall aim of this Work Package was to establish a permanent online platform for knowledge exchange among organic arable and advisers, and to disseminate the project outcomes to farmers, farm advisers, relevant stakeholders and the wider public.

Task 4.1 Development of the knowledge platform and project website.

Lead partner: AU/ICROFS

Partners involved: all partners

The public version of the farmknowledge platform was launched with a press release on 03/10/2016. It is available in 10 languages (English, Dutch, French, German, Danish, Bulgarian, Italian, Hungarian, Estonian, Latvian). At the time of launch, the platform consisted of a toolbox and a discussion forum. A detailed description of the features of the knowledge platform at the time of launch is available in deliverable D4.1. Since the launch of the platform, it has been developed further according to suggestions from project partners and other users:

- Improvement of the homepage
- Improvement in the way search results are displayed

- Improvement of tool description pages, e.g. a “teaser” line has been added for each tool
- Development of icon for practice abstracts
- Improvement of the tool description template, i.e. table with metadata needed for each tool
- On-line course added on the platform
- “Farm news” page added with reports of the practical testing activities

Task 4.2 Presentation and evaluation of end-user and education material in the online knowledge platform

Lead partner: AU/ICROFS

Partners involved: all

During the project, all partners suggested new tools to be evaluated and if relevant included on the knowledge platform. The suggested tools were evaluated on a set of criteria described in D3.3 and if selected, described in a tool description template, ensuring a uniform description and including all relevant metadata (see also D4.3). If a tool was under copyright, the owners were asked for permission to deposit the tool in Organic Eprints, which is the database underlying the knowledge platform. If no permission was obtained, the tool metadata including a link to where it can be found, were shown in the knowledge platform.

At the time of reporting, 139 tools were selected and described (94) or produced (45) by the project of which 133 tools had already been added to the knowledge platform. 20-30 more tools are still waiting for a final check or additional information before they will be uploaded.

In addition, a page with “Farm knowledge sharings” from the farmer innovation groups has been created, where each group presents the results of their practical testing activities through videos (7), practice abstracts (11) and other information.

Task 4.3 Maintaining the knowledge platform and moderating the discussion forum

Lead partner: IFOAM EU

Partners involved: all

The maintenance of the platform was executed by AU/ICROFS, based on the input from the Steering Committee and other partners.

The discussion forum

Only little use was made of the discussion forum. In total, the five themes have less than 100 comments – and most of those are tool recommendations made by project partners. Regarding the individual tools, only 12 tools received any comment. IFOAM EU started to recommend the ‘tool of the week’ in December 2016, i.e. 2 months after the platform was launched. The selected tools were posted under the relevant theme in the discussion forum on the platform and advertised on IFOAM EU’s Facebook and Twitter account with a link to the platform. The recommended tools were selected in such a way to maintain balance in language, type and topic. Every week all the partners were asked to post the recommended tools, either by using the post of IFOAM EU directly or first editing/translating it. The visitor statistics show that the recommended tools of the week did attract people to the platform to study the tools (see D4.4). Between December 2016 and 1 March 2018, IFOAM EU has published 50 Facebook posts and 50 tweets, using hashtag #OKNETArable or #organic. The Facebook

posts were usually liked on average by 1-8 people and the tweets were retweeted 2-6 times. Experience shows that posts/tweets should be short (max 200-280 character) but informative. A shortened link to the tool and a well selected picture should be attached to the post.

Setting up the farmknowledge platform was a success. After a slow start, the visitor numbers have been continuously increasing since September 2017. The visitor statistics show that starting from the second month of the platform (November 2016) until January 2018, the platform attracted on average 739 unique visitors/month. The work that has been done will not be lost. In the project application of OK-Net Arable, some partners already agreed to continue the platform for at least 5 years after the end of the project, namely: IFOAM EU, AU/ICROFS, FiBL, PFT Ltd/ORC, Bioland, AIAB and IAMB. These partners have now agreed on the following steps to continue the platform:

- Continuation under OK-Net EcoFeed
- Using farmknowledge.org as dissemination platform for other projects
- Strengthening link with Organic Eprints
- Improvement of the functioning of farmknowledge.org

By implementing those 4 steps, the farmknowledge platform will be positioned as a reference knowledge hub for practical information on organic farming at EU-level, disseminating knowledge from all kinds of projects, not only Horizon 2020. It will also be explored how to open the platform and give the possibility to new "core partners" to join the initiative, to use the platform and support it. A more detailed plan for the continuation of the farmknowledge platform is available in D4.4.

Task 4.4 Online training courses

Lead partner: IAMB

Partners involved: IAMB, IFOAM EU, AU/ICROFS

Two facilitated on-line courses “Challenges of Organic Arable Farming” were held. The first on-line course took place from 3 April to 30 June 2017; the second from 4 September to 30 November 2017. Both courses lasted for three months and included six modules covering the main five topics of OK-Net arable: Soil quality and fertility, Nutrient management, Pest and Disease control, Weed management and Crop specific issues. The sixth module provided a synthesis and rehearsal of information provided in previous modules, with focus on the perspective of the farmer groups. For each module, theoretical background was provided, with integration of topic-specific tools from the farmknowledge.org platform. All the materials were provided in English. The courses were developed using the Learning Management System (LMS) on the CIHEAM-Bari e-learning platform and were addressed to 70 participants from 26 countries (77% European countries and 23% non-EU Mediterranean countries). Participants represented different institutions and profiles, such as ministries of agriculture, universities, certification bodies, farmers, private companies, research centres, extension services etc. Participants were split up in groups and a tutor was assigned to each group in order to prepare the teaching materials, guide the participants through the learning process, moderate the discussion forum, answer questions or address them to the external experts whenever needed, and collected the evaluation forms.

The materials used in both facilitated courses were re-organized to be used in the self-learning course. Material was uploaded on the farmknowledge platform on a space devoted to the self-learning course <http://farmknowledge.org/index.php/courses>. The course is now open for all those that are interested. Users can easily read and/or download the material. Each

presentation provides links to the tools enabling users to read and/or download them and add comments.

A full description of the development and implementation of the on-line course is provided in deliverable D4.2.

Task 4.5 Public relations & communication

Lead partner: IFOAM EU

Partners involved: all

IFOAM EU coordinated the communication about the project activities and dissemination of the project results. This was done at two levels. At European level the project was promoted through the project website and the websites and newsletters of IFOAM EU and TP Organics, the European Technology Platform for Organic Food and Farming. At national level, all partners, in particular the practice partners had a key role in dissemination, because the main target audience of the project are farmers and farm advisers working at the local level. Project partners used their existing communication channels, which are well-known and used by the target audience.

All project partners have set-up a page dedicated to the project on their website (or section, depending on the structure of their website). An I-frame has been developed to allow searching on the farmknowledge platform from the partner's websites. The I-frame is available on 10 websites out of 17 project partners. IFOAM EU also provided project partners with articles they had to disseminate through their communication channels (website, newsletters, magazines). In the second reporting period, articles were provided about the launch of the knowledge platform, the final conference, the call for participants for the facilitated on-line courses and the availability of the self-learning on-line course on the knowledge platform (latter two articles produced by IAMB).

IFOAM EU has provided Facebook and Twitter posts to all project partners every week, starting from December 2016. The posts contained a short introduction about the "recommended tool of the week", a picture, a link to the tool on the platform, a link to the discussion forum and the hashtag #OKNETArable. The posts were posted on IFOAM EU's Facebook and Twitter account and under the relevant theme in the discussion forum of the farmknowledge platform. By 1 March 2018, 50 posts (described above) were made by IFOAM EU. Project partners either directly used the post of IFOAM EU or made their own post and tweets, translating them into their own language, making it more popular among their national members.

At the end of 2017, a Facebook group was set up, as it was requested by the farmers from the farmer innovation groups. We are still advertising this group and working on making it more attractive to users. This group will continue to exist even after OK-Net Arable has stopped, as the continuation project of OK-Net Arable, OK-Net EcoFeed will take it over. As this group has been launched recently, the effect is not known yet.

A YouTube channel was set up to share the videos made within the project. At the time of reporting, 9 videos were available on the channel. This includes the "Organic Soybeans Made Easy!" video produced by FiBL Austria, 3 videos with results of the practical testing activities, 1 video about the visit of Belgian farmers to Danish farmers, and 4 videos with presentations of the French farmer innovation groups (RotAB and BASE-ABC). Four more videos resulting from the practical testing activities were produced by practice partners, but

partners preferred to upload it on their own YouTube channel as this channel is best known by their farmers.

EIP-AGRI

IFOAM EU has regularly updated the EIP-AGRI service point about the developments of OK-Net Arable. Following articles have been published:

- article about launch of the knowledge platform in EIP-AGRI newsletter of December 2016
- article about the outcomes of the workshop ‘Organic is Operational’, where OK-Net Arable was presented, in newsletter of November 2017
- article about Organic Innovation Days and the OK-Net Arable final conference in the newsletter of January 2018

A description of OK-Net Arable is included in the project database of the EIP-AGRI website. All tool descriptions and practice abstracts made during the 3 years of the project have been compiled in the EIP-AGRI common format and submitted to the EIP-AGRI database in March 2018 (see deliverable D4.5).

IFOAM EU participated in and presented OK-Net Arable at the EIP-AGRI Workshop “Organic is Operational” in Hamburg (Germany) in June 2017. The workshop had more than 80 participants. Finally, IFOAM EU presented OK-Net Arable at the Agri Innovation Summit. This summit brought together over 600 farmers, rural businesses, researchers, NGOs and other innovation actors in Lisbon (Portugal). The event was a joint initiative between a Portuguese Consortium, the Portuguese Government, the EIP-AGRI network and the European Network for Rural Development.

Final conference

The OK-Net Arable final conference was co-organized with the 3rd edition of Organic Innovation Days (the annual event TP Organics, the European Technology Platform for Organic Food & Farming) on 15-17 November 2017 in Brussels. The OK-Net Arable final conference itself took place on 15 November 2017 and gathered 60 participants. During the day, best practices for increasing organic arable yields and testimonies from three project partners were presented covering mechanical weed control, assessing soil quality with a spade test, use of green manures and direct sowing. Farmknowledge.org was also presented at the event. The conference closed with a roundtable discussion on knowledge exchange and innovation support in the organic farming sector. Besides of project partners, speakers included Inge Van Oost (DG AGRI, European Commission) and Adrien Guichaoua (ACTA and co-chair of SCAR-AKIS Strategic Working Group).

BIOFACH 2017

On 16 February 2017, OK-Net Arable did a session at the BIOFACH trade fair in Nuremberg (Germany). Partners involved were IFOAM EU, ORC, ICROFS and ITAB. During the session, the knowledge platform was presented as well as a testimony from the farmer innovation groups in France. BIOFACH is the world’s largest trade fair for organic food and is highly attended by farmers, organic enterprises and other actors in the sector.

1.3 Impact

Table 2 describes how OK-Net Arable has met the expected results highlighted in the call ISIB2-2014 ‘Closing the research and innovation divide: the crucial role of innovation support services and knowledge exchange’ as written in the original DoA and provides an update of this information where necessary.

Table 2: Achievement of the expect impacts of call ISIB2-2014 by OK-Net Arable

Original description (DoA)	Update from first reporting period	Second Update
Expected impact - Improved flow of information and knowledge between academia and practitioners in particular on agricultural practices and innovations		
<p>The overall aim of the thematic network ‘OK-Net Arable’ is to increase productivity and quality in organic arable cropping all over Europe by improving the exchange of innovative and traditional knowledge among farmers, farm advisers and scientists. To secure an optimal flow of information and knowledge between academia and practitioners the consortium consists of 17 partners of which 9 are well-established farmer innovation groups, 3 are organic research institutes and 5 are organisations engaged in advisory service, training and/or dissemination of research results</p>	<p>The configuration of the partners has slightly changed. From the 17 partners, 10 do coordinate farmer innovation groups. These partners are the practice partners. Some practice partners manage more than one farmer innovation group, which makes that the total number of farmer innovation groups in the project is 14. PFT Ltd/ORC is in charge of managing the network of farmer innovation groups, but also coordinates one group of farmers in the UK, which provides useful feedback on the proposed steps, and is thus acting as a practice partner at the same time.</p>	<p>The configuration of the project partners has remained the same. The practical testing activities led to an intensive flow of information between academic partners and practitioners. Farmer innovation groups proposed experiments and received feedback from the Steering Committee. Practice partners described results in practice abstracts, which were reviewed by FiBL. Farmer innovation groups also provided feedback on practice abstracts produced by academic partners. Finally, all partners have jointly made a big effort to make available 139 tools and potentially more on the knowledge platform.</p>
Expected impact of the call - Increased exchanges between European regions on innovative matters		
<p>The whole consortium covers in total 13 countries, of which the involved farmer innovation groups cover 9 countries situated in the North, East, West, central and South of Europe. This results in a well-balanced representation of different climatic, geographical and socio-economic conditions and gives optimal possibilities for exchange of information and learning between different European regions.</p>	<p>The farmer innovation groups now cover 10 countries, namely France, UK, Belgium, Germany, Denmark, Estonia, Austria, Hungary, Bulgaria and Italy</p>	<p>Seven exchange visits were facilitated, offering the opportunity for over 220 farmers, advisors and researchers from all farmer innovation groups across the OK-Net Arable network to meet and exchange knowledge in the field. These were based on topics selected by the farmer innovation groups in a share and learn session at a farmer meeting in Udine in January 2017. The exchange visits gave the opportunity to observe innovations in the field in different geographical and socio-economic contexts and share experiences and received positive feedback from the farming community.</p>

Expected impact of the call - Successful deployment of the vast reservoir of existing scientific and practical knowledge		
<p>The project (WP3) will screen, synthesize and combine research results from EU, CORE Organic and national research projects as well as other international research, and practical knowledge in the form of technical solutions and best practices concerning nutrient supply, soil fertility management, weed management, pest and disease management and crop variety choice. These areas are seen as the key areas for increasing the productivity and sustainability of organic arable cropping in Europe by the EIP AGRI Focus Group on Organic Farming – Optimising Arable Yields.</p>	<p>A report on state-of-the-art research results and best practices was produced (deliverable D3.1). This report summarizes peer-reviewed research on the productivity of organic arable crops taking into account the recommendations of the EIP-AGRI Focus Group on Organic Farming. Furthermore, it draws conclusions and recommendations for five important levers which can be deployed by farmers (soil fertility management; availability and uptake of plant nutrients, weed competition, disease control, and pest regulation). This report, together with the challenges and solutions from the farmer innovation groups (described in deliverable D2.1), forms the basis for the selection of end-user materials and tools that are tested by the farmer innovation groups and made available in the knowledge platform.</p>	<p>OK-Net Arable endeavoured to make available a large number of tools that are based on sound scientific knowledge and that are user-friendly, meaning that the knowledge is clearly communicated in a format suitable for end-users. At the time of reporting, 139 tools were selected or produced by the project. The exercise was based on state-of-the-art research results and best practices (D3.1), the recommended methods and tools for knowledge exchange (D3.2), and the challenges and solutions from the farmer innovation groups (D2.1). The exercise of collecting tools from different sources showed the large amount of available knowledge and experiences and the large potential to improve its dissemination, use and further elaboration.</p>
Expected impact of the call - Focused collection of innovative knowledge on specific themes, a greater user acceptance and intense dissemination of solutions for a more competitive and sustainable agriculture to farmers and other actors in the agricultural innovation chain		
<p>The active involvement of the farmer innovation groups will ensure a focused collection of relevant innovative knowledge. Further, to increase the user acceptance and take up of the innovative solutions the project (WP3) will identify the best methods for learning and knowledge exchange among farmers, advisors and researchers and adapt these to ensure the best learning. The 9 farmer innovation groups will be involved in the selection and testing of the end-user and education material to secure and understand the reasons for user acceptance and successful implementation. The project will strongly enhance the knowledge flow between farmer groups in different European countries, and so contribute to closing the yield gap between conventional and organic arable</p>	<p>The experience of the project so far has shown that the active involvement of the farmer innovation groups is very valuable, but has also highlighted clear differences in the expectations what the project can deliver. Whilst there is a good alignment between the farmer groups and the experts' opinion about the challenges faced by organic arable farming, the same is not necessarily true for the expectations on how these challenges can be addressed. There appear to be differences in the understanding between farmers and researchers what consists a useful 'tool'. For instance, some farmers expected new mechanical devices to be produced by the project. It will be communicated that developing sensors, cameras and mechanical devices is outside the scope of this thematic network project. A regular</p>	<p>Active involvement of farmer innovation groups was encouraged from the early stages of the project. Initial workshops invited farmers to identify the priority areas and key challenges. These varied across the groups but a significant focus was placed on soil health and weed control. This was reflected throughout the project.</p> <p>Feedback from the farmer innovation groups at the project meeting in Newbury was crucial to simplify the selection criteria for tools, and collect tools that are more in line with needs and expectations of farmers.</p> <p>Farmer innovation group meetings provided an opportunity for farmers, advisors and researchers to learn together and share knowledge. The identification</p>

<p>farming. Many of the end-user material will also be relevant to improve sustainability in arable farming in general, e.g. tools for improvement of soil fertility management and water holding capacity</p>	<p>newsletter about project activities particularly aimed at the practice partners has now been started (first issue in September 2016). The farmer groups also expressed that they like visual presentations (with pictures, videos) and interactive tools. This feedback will help to improve shared understanding and generate some useful insights regarding the selection of the second offer of tools and the production of project materials (e.g. practice abstracts) that are used for sharing existing solutions.</p>	<p>of tools for further practical testing provided an interesting space for practical learning and co-innovation. In total 11 practical trials were conducted. Results and insights from these tests were then shared with other groups in the exchange visit in Valence and on the 'farm news'-page on the farmknowledge.org platform. These new connections enhanced knowledge flow between farmer groups in different European countries seeking to close the organic yield gap.</p> <p>Practice abstracts (43) developed in the project provide insights from different European contexts on the latest best practice in organic agriculture and facilitate exchange between partners.</p>
<p>Expected impact of the call - Thematic networks delivering accessible and long-term available end-user material on the themes which should also generate a better targeted and shared research agenda for innovation-driven research and multi-actor projects</p>		
<p>The project (WP4) will develop a long-term available knowledge platform, which will be closely linked with Organic Eprints (www.orgprints.org), an open access database established by AU/ICROFS in 2002 and the website of the European Technology Platform (ETP) TP Organics (www.tporganics.eu), hosted by IFOAM EU as well as the respective websites of all partner organisations. This knowledge platform will make available all the end-user material developed during the project. The platform will be linked with already existing farmer and advisory service websites as well as the EIP-AGRI website to ensure the broadest possible access to the end-user and education material. After the end of the project the knowledge platform will be maintained for at least 5 years. The following project partners have committed to put their own resources in the maintenance and further development of the knowledge platform after the end of the project: IFOAM</p>	<p>The knowledge platform has been developed and is closely linked with Organic Eprints, where the metadata of the end-user materials are stored. It was decided not to link the platform directly to the website of TP Organics, since the CMS of both websites are different, but the knowledge platform has been made in the same colours and visual identity as TP Organics. The knowledge platform contains descriptions of the end-user material collected and developed during the project. Later, practice abstracts will be added. Linking the database of the knowledge platform with the EIP-AGRI database can easily be done because the knowledge platform uses the same keywords. An i-frame will be created that project partners will integrate in their websites and that will allow direct searching on the platform's database.</p> <p>The agreement to maintain the platform for at least 5 years after the end of the project has not been</p>	<p>The public version of the farmknowledge platform was launched on 03/10/2016. It is available in 10 languages (English, Dutch, French, German, Danish, Bulgarian, Italian, Hungarian, Estonian, Latvian). Since the launch several changes and improvements have been done based on feedback by the project partners. The platform has been a success. Starting from the second month of the platform (November 2016) until January 2018, the platform attracted on average 739 unique visitors/month. The material on the platform will be long-term available. The platform will be continued under OK-Net EcoFeed and be used as dissemination platform for other projects. The aim is to make the platform the reference hub for practical knowledge in organic farming in Europe.</p> <p>Deliverable D2.4 (Recommendations for a common research agenda) is based on experiences in the</p>

<p>EU, AU/ICROFS, FiBL, PFT Ltd/ORC, Bioland, AIAB and IAMB.</p> <p>A specific task is foreseen in WP2 to make recommendations for a better targeted and shared research agenda based on the exchange and the experience with testing materials of the farmer innovation groups.</p>	<p>changed.</p> <p>The work leading to recommendations for a shared research agenda will start in April 2017.</p>	<p>project (mainly D2.1, D2.2 and D3.1), but also on questionnaires with which additional research needs in the countries, the national research agendas and experiences with methodologies were collected. The report gives recommendations regarding topics for a common research agenda for organic arable farming and for methodologies to co-create common research agendas.</p>
<p>Expected impact of the call - Improved skills and education material on innovation approaches and on specific thematic areas.</p>		
<p>End-user and education material developed and made available at the knowledge platform will be selected and tested by the involved farmer innovation groups to ensure that the different end-user materials are easy to understand and addressing the needs of farmers. The exchanges and workshops with the farmer innovation groups will be supplemented with a discussion forum at the knowledge platform where all stakeholders may comment on the relevance and usability of the end-user and education material. Finally, online training courses for farm advisers will be developed to teach them how to use specific, technical end-user material (e.g. nutrient budgeting tools or, tools that forecast likely disease incidents).</p> <p>The themes covered by the end-user and education material are the five themes mentioned under expected impact 3.</p>	<p>The process of testing end-user material with the farmer innovation groups has started in 2016 and is currently underway. Based on the initial discussion of the “offer of materials” at the project meeting in April 2016, it appears that the expectations of the farmer groups have not fully been met.</p> <p>Many of 30 tools proposed were information sites or documents, whereas the farmer groups were expecting to get access to equipment (for example for weed control), apps and decision-support tools or more simple guidelines that can be applied. These concerns will be addressed in the next offer of tools that will be presented and discussed at the project meeting of 25-27 January 2017. Also, language issues have emerged but the project has budget available to translate some end-user materials which might help to overcome this problem. Discussion has also shown that there is considerable difference in the materials available to the farmer groups depending on the strength of the organic sector in their respective country.</p>	<p>Farmer innovation groups were actively involved in the testing of knowledge exchange tools in two workshops. This process identified key success factors in designing tools including the use of visual information, details of the context and farmer experience. It also highlighted videos and decision support tools as having potential to further enhance online knowledge exchange.</p> <p>The farmknowledge.org platform brings together the best of these tools gathered from leading organisations across Europe making new information available to farmers. The importance of adaptation to local context and information in local language was emphasized by farmers. 28 of these tools were also adapted and translated through the project to further enhance accessibility of information.</p> <p>IAMB developed two facilitated courses and a self-learning course according to the international E-Learning standards to promote the use of tools and end-user material beyond the farmer innovation groups. The facilitated courses reached 70 participants from 26 countries (77% European countries and 23% non-EU Mediterranean countries). Participants represented different organisations, such as ministries of agriculture, universities, certification bodies, farmers,</p>

		private companies, research centres, extension services... The self-learning course is available on a dedicated page of the farmknowledge platform.
Expected impact of the call - Support to implementation of the European Innovation Partnership (EIP) 'Agricultural Productivity and Sustainability'		
<p>The project supports the implementation of the EIP 'Agricultural Productivity and Sustainability' and in particular the recommendations of the EIP-AGRI Focus Group on Organic Farming. Although the thematic network will only develop end-user material based on already available research results and practical experiences, the following of the research recommendations of the Focus Group will be addressed in some way:</p> <ul style="list-style-type: none"> ▣ Analysis of contribution of organic management practices on carbon sequestration, water holding capacity and erosion reduction. ▣ Selection of varieties with increased resistance to abiotic stress. ▣ Adaptation of conservation agriculture techniques to organic systems. ▣ Improvement of the knowledge on crop rotation multi-performance and ▣ Development of locally adapted implementation monitored by multi-criteria tools. ▣ Development of improved inter-sowing and under-sowing systems. ▣ Development of more precise and easy-for-use forecasting tools. ▣ Development of highly diverse systems to prevent soil pathogens. <p>The project also addresses some of the recommendations of the Focus Group concerning training and education:</p> <ul style="list-style-type: none"> ▣ Development of new tools for knowledge sharing based on ICT and social media or other on-line tools. ▣ Use of information and decision support systems. ▣ Tillage optimisation. ▣ Functional biodiversity 	<p>Deliverable D3.1 (report of state-of-the-art research results and best practices), which took into account the recommendations of the EIP-AGRI Focus Group on Organic Farming, analysed bottlenecks in organic arable farming related to soil fertility management; availability and uptake of plant nutrients, weed competition, disease control, and pest regulation. The report, as well as the first and the second offer of end-user material, offers a selection of existing technical solutions and a variety of methodological and locally adaptable approaches, fostering the implementation of the recommendations made by the EIP-AGRI Focus Group. For the second offer of end-user material, practice abstracts are developed by and shared among researchers, advisors and farmer innovation groups.</p> <p>Contrary to the report of the EIP-AGRI Focus Group on Organic Farming variety choice was not made a separate theme on the knowledge platform. Rather the importance of selecting the right variety is addressed by several tools in other themes of the platform (weed management, pest and disease control and crop-specific tools).</p>	<p>OK-Net Arable took part in the EIP-AGRI Workshop "Organic is Operational" in Hamburg (Germany) in June 2017 which provided an opportunity to reach out to Operational Groups working on similar issues.</p> <p>All tool descriptions and practice abstracts produced by OK-Net Arable have been compiled in the common format (excel file) and submitted to the EIP-AGRI database. The tools cover the 5 themes of soil quality and fertility, nutrient management, pest and disease control, weed management and cropping systems and crop specific issues. These themes correspond to the bottlenecks identified by the EIP-AGRI Focus Group on Organic Farming.</p> <p>The Focus Group also highlighted the need to "develop new tools for knowledge sharing based on information and communication technology, and social media or other online tools". OK-Net Arable has fully contributed to that. A knowledge platform with 133 tools has been set up. More tools will be added in future. Experiences have been gained with online knowledge sharing through discussion forum and social media. Deliverable D2.3 explores what can be learned from the feedback of the farmer innovation groups on knowledge exchange tools in relation to taking knowledge exchange on-line.</p>

1.4. Access provisions to Research Infrastructures

Not applicable

2. Update of the plan for exploitation and dissemination of result

The original DoA summarizes the plan for exploitation and dissemination in two tables. One describing the target groups of the dissemination activities and one describing the use of the various media channels. An updated version of these tables is given in Table 3 and 4.

Table 3: Target groups of dissemination activities (update in green)

Target group	Goal	Channel/media	
Farmers involved in the farmer innovation groups	To encourage participation in the project, use of the end-user material and participation in the discussion forum	*WP2 activities *Online Knowledge Platform *Partners' existing websites *Partners' existing newsletters/magazines *Twitter *Facebook	*YouTube *Final project conference *Free online courses by CIHEAM-IAMB *Self-learning course on the knowledge platform
Other (organic) farmers	To encourage use of the education material and participation in the discussion forum	*Online Knowledge Platform *EIP-AGRI website + newsletter *Partners' existing websites *Partners' existing newsletters/magazines *TP Organics website and newsletter *Session at BIOFACH 2017 (50 participants)	*National agricultural magazines *Twitter *Facebook *YouTube *Final project conference *Free online courses by CIHEAM-IAMB *Self-learning course on the knowledge platform *EIP-AGRI workshop 'Organic is operational' * radio programs (In Italy Radio Rai 1) * weekly practitioner newsletter (AIAB-FVG)
Farm advisors, innovation brokers, agricultural school teachers	To raise awareness of the end-user material, demonstrate its relevance, and encourage use	*Online Knowledge Platform *Partners' existing websites *Partners' existing newsletters/magazines *National agricultural magazines	*EIP-AGRI website + + newsletter *Twitter *Facebook *YouTube *Final project conference / Organic

		<ul style="list-style-type: none"> *National online forums of (organic) agriculture sector *Session at BIOFACH 2017 (50 participants) *Participation in thematic networks meeting on 3 February 2017 	<ul style="list-style-type: none"> Innovation Days **Free online courses by CIHEAM-IAMB *Self-learning course on the knowledge platform *EIP-AGRI workshop 'Organic is operational'
Scientists	To raise awareness about the activities and outcomes of the project, show relevance of multi-actor learning, disseminate state-of-the art research results and best practices compiled during the project	<ul style="list-style-type: none"> *Online Knowledge Platform *Scientific journals *Existing newsletters and websites of PFT Ltd/ORC, FiBL, AU/ICROFS and TP Organics *Twitter 	<ul style="list-style-type: none"> *Facebook *YouTube *Final project conference/Organic Innovation Days *Session at Biofach 2017 (50 participants) *participation in thematic networks meeting on 3 February 2017
Decision makers	<p>To raise awareness of the project so that the outcomes can guide next steps in the implementation of the EIP-AGRI</p> <p>To show relevance of multi-actor learning model applied in the project</p>	<ul style="list-style-type: none"> *Meetings with DG AGRI / DG RTD *Meetings of ERA-Net CORE Organic *Meetings of Stakeholder Advisory Board of FACCE-JPI *Participation in thematic networks meeting on 3 February 2017 *Presentation at civil dialogue group on 10/11/2016 (40 participants) 	<ul style="list-style-type: none"> * EIP-AGRI conferences at EU level *National EIP-AGRI conferences *Meetings Permanent Subgroup on Innovation for Agricultural Productivity and Sustainability *EIP-AGRI workshop 'Organic is operational' *Final project conference/ Organic Innovation Days *presentation at SCAR-AKIS meeting on 27 March 2017 (40 participants)
General public	To show that the organic sector is an innovative sector continuously seeking to improve production and sustainability performance	<ul style="list-style-type: none"> *Online Knowledge Platform *Twitter *Facebook 	<ul style="list-style-type: none"> *Final project conference at Organic Innovation Days *Presentation at civil dialogue group on 10/11/2016 (40 participants)

Table 4: Media channels of dissemination activities

Media channel	Time	Responsible	Success criteria	Means of verification	Activities carried out in the reporting period
WP2 activities	Whole project duration	PFT Ltd/ORC	<p>Knowledge of the end-user material among 90% of participating farmers</p> <p>Long-term uptake of the tested end-user material, knowledge and best practices by the participating farmers of at least 50%</p>	Survey with farmers innovation groups in task 2.3	<p>See description under 1.2.2 Work package 2 - Facilitation of testing with farmer innovation groups</p> <p>Survey with farmer groups in task 2.3 has been implemented in month September 2017.</p>
Online Knowledge Platform	October 2016- February 2018	AU/ICROFS IFOAM EU	600 unique visitors/month starting from February 2017	Website traffic statistics	<p>From the second month of the platform (November 2016) until January 2018, the platform attracted on average 739 unique visitors/month.</p> <p>In January, February, March 2017 the number of unique visitors/month were more than 600. From April 2017 to August 2017 the number of unique visitors/month were less than 600. From September 2017 until February 2018 the number of unique visitors/month was again higher than 600.</p>
EIP-AGRI Website and newsletters	Whole project duration	IFOAM EU	<p>EIP-AGRI Service Point is asked to disseminate Information about project activities when relevant.</p> <p>All practice abstracts will be submitted to the EIP-AGRI database by February</p>	Double-check at end of each project year	<p>An article about the knowledge platform has been published in the EIP-AGRI newsletter of December 2016.</p> <p>An article about the workshop 'Organic is Operational', where OK-Net Arable was presented has been published in the edition of November 2017.</p> <p>An article about Organic Innovation Days and the final conference has been published in the edition January 2018.</p> <p>A description of OK-Net Arable is included in the project database of the EIP-AGRI website.</p> <p>All practice abstracts have been submitted to the EIP-AGRI database by March 2018.</p>

			2018.		
Partners' existing websites	Whole project duration	All partners with help of IFOAM EU providing articles	Permanent page at website about knowledge platform I-frame to online knowledge platform allowing direct searching on the knowledge platform by December 2016	Ask partners to provide URL Check progress in November 2016	All partners have a page (or section, depending on the structure of their website) about the project. I-frame has been developed and 10 out of 17 partners have the I-frame on their website
Partners' existing newsletters/magazines	Whole project duration	All partners with help of IFOAM EU providing articles	Minimum one article per project year about the project, the knowledge platform or specific end-user material in the newsletters	Check towards end of each project year	IFOAM EU produced an article about the launch of the knowledge platform (2016) and about the final conference (2017) and provided it to partners. CIHEAM-IAMB with help from IFOAM EU produced an article about the call for participants for the on-line courses (2017), and about the self-learning online course (2017). IFOAM EU provided the articles to the partners.
National agricultural magazines (other than those of partners) National online forums of (organic) agriculture sector	Whole project duration	Farmer innovation groups with help of IFOAM EU	Minimum one article in one national media channel of (organic) agriculture sector in each participating country	Media-clip count	Articles in magazines other than those of the partners have been published in Belgium, Bulgaria, Denmark, Ireland, Italy, Spain, UK, and in international media (Europe-, and worldwide). All partners were required to send out press releases to promote the knowledge platform, the facilitated and self-learning online courses and the final conference.
TP Organics website and newsletter	Whole project duration	IFOAM EU	Integrate I-frame in TP Organics website allowing direct searching on the knowledge platform by December 2016 Minimum two articles per project year about the project, the knowledge platform or specific end-user material in newsletter.	Check progress in November 2016 Check towards end of each project year	I-frame has been developed and inserted on TP Organics website. 4 articles mentioning OK-Net Arable have been published in the newsletter of TP Organics in 2017.
Twitter	Whole project duration	IFOAM EU All partners	Regular tweets; starting from December 2016 at least one every week. IFOAM EU will make postings on the discussion	Count every month, starting in December 2016	50 tweets were made about the tools on the knowledge platform by IFOAM EU, since December 2016 until 1 March 2018. Partners have

			forum of the knowledge platform which will be re-tweeted by partners.		re-tweeted those posts or made their own with translated versions.
Facebook	Whole project duration	IFOAM EU All partners	Regular posts; starting from December 2016 at least one every week. IFOAM EU will make postings on the discussion forum of the knowledge platform which will be shared by partners on Facebook.	Count every month, starting in December 2016	Since December 2016, 50 Facebook posts were made about the tools on the knowledge platform by IFOAM EU. Partners have shared those posts or made their own with translated versions.
YouTube	September 2016- February 2018	IFOAM EU	All videos made or translated during the project are available on YouTube and embedded on the knowledge platform	Check achievement at end of project	During the project 24 videos have been collected. In addition, 7 videos were produced about practical testing activities; 1 video was produced about organic soybean production, 1 video about the visit of Belgian farmers to Danish farmers, and 4 videos with presentations of the French farmer innovation groups. All videos are available on YouTube, either on the OK-Net Arable YouTube channel, or on the channels of the project partners,
Online training courses	February 2017- February 2018	IAMB	40 farm advisers have participated in the courses and have learnt how to use the end-user material	Count at end of project	The first on-line course started on 3 April and was completed on 30 June. The second course started on 4 September and was completed on 30 November 30. A total of 70 participants, from 26 countries, attended the first and the second courses.
Scientific journals	February 2017- February 2018	PFT Ltd/ORC, AU/ICROFS, FiBL	3 scientific, peer-reviewed papers drafted.	Count number of scientific papers being prepared at end of project	One publication "OK-Net Arable online knowledge platform" was published in the Proceedings of the Scientific Track at the Organic World Congress 2017 (New Delhi). One paper "The mutual learning process in practice: a survey on organic arable farming in EU" was presented at the Conference on Democratizing Food Governance in Rome in 2016. Deliverable D2.3 has been submitted as a scientific paper to the Springer Journal Organic Agriculture.

Meetings with coordinators of other thematic networks	Whole project duration	IFOAM EU	Annual participation in the coordinators' days organised by REA	Check at end of each project year	REA didn't organise coordinators' days for OK-Net Arable in the second reporting period, but IFOAM EU participated in the Thematic Networks meeting organised by COPA-COGECA on 3 February 2017
Meetings of ERA-Net CORE Organic+	Whole project duration	IFOAM EU	Minimum one meeting per project year	Check at end of each project year	IFOAM EU participated in the Governing Board meeting of 17-19/10/2016 in Bucharest and the meeting 24-25/10/2017 in Namur.
Meetings of Stakeholder Advisory Board FACCE-JPI	Whole project duration	IFOAM EU	Minimum one meeting per project year	Check at end of each project year	IFOAM EU participated in the Stakeholder Advisory Board meetings of 01/12/2016, 28/04/ 2017, 24/10/2017, 23/02/2018,
Meetings SCAR-AKIS working group	Whole project duration	IFOAM EU	Participation in at least 80% of meetings	Check at end of each project year	IFOAM EU presented OK-Net Arable at the SCAR-AKIS meeting in Bratislava on 27/03/2017
EIP-AGRI seminars/workshop	Whole project duration	IFOAM EU	Participation in at least 80% of seminars/workshops to which IFOAM EU is invited	Count at end of project	IFOAM EU participated in all workshops and conference to which it was invited. These were the EIP-AGRI Workshop Organic is Operational in Hamburg on 14-15/06/2017 and the Agri-Innovation Summit in Lisbon (11-12/10/2017)
Meetings Permanent Subgroup on Innovation for Agricultural Productivity and Sustainability	Whole project duration	IFOAM EU	Participate in all meetings during project period	Block date as soon as invitation is received	IFOAM EU participated in all meetings of the Subgroup on Innovation, except one (participated in meetings of 20/10/2016, 08/06/2017, 13/10/2017, 22/02/2018).
Organic Innovation Days	December 2016	IFOAM EU	<p>"Increasing productivity and quality in organic arable farming" will be one of the themes of the Organic Innovation Days on 06-07/12/2016. This is an opportunity to promote OK-Net Arable and the knowledge platform.</p> <p>At least 50 participants in Organic Innovation Days</p>	Count signatures on participants list	58 participants have attended Organic Innovation Days on 6 December 2016 and 61 participants on 7 December 2016.
Final project conference	December 2017	IFOAM EU	The final project conference will be organised back-to-back with the Organic Innovation Days of TP Organics.	Count signatures on participants list	61 people have participated in the final project conference, which was organized back-to-back with the third edition of Organic Innovation Days of

		At least 50 participants		TP Organics.
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3. Update of the data management plan (if applicable)

Not applicable

4. Follow-up of recommendations and comments from previous review(s) (if applicable)

Not applicable

5. Deviations from Annex 1

5.1 Tasks

5.1.1 Work Package 1 - Project coordination and representation

Overall there were some but no significant delays in Work Package 1. By mistake the minutes of project meetings (D1.5, D1.6) were uploaded on the participant portal later than the due date, but this did not affect the implementation of the project. Project partners were informed of all tasks to be implemented after each project meeting.

5.1.2 Work package 2 - Facilitation of testing with farmer innovation groups

In task 2.3, it was foreseen that 1 general and 5 smaller workshops would be organised, allowing the exchange of experience between the farmer innovation groups. This was replaced by two exchange workshops (combined with a field visit) for all farmer innovation groups (adjacent to project meetings), and 5 additional exchange visits organised by the practice partners in task 2.1 (see section 1.2.2 above).

All milestones and deliverables have been achieved with minor delays.

5.1.3 Work package 3 - Synthesise research results, best practices and learning methodologies

It was decided to finalise and submit deliverable D3.3 “Collection of end-user material” at the end of the project rather than at the end of the second project year. This made it possible to include all tools that are uploaded on the farmknowledge platform, as well as all practice abstracts, videos and translations that were made during the project. If the deliverable was submitted earlier, it would not have been complete.

5.1.4 Work package 4 - Knowledge platform and communication

All milestones were achieved on time. Deliverables were submitted with some delay, mainly because the reporting took more time than foreseen. Project activities necessary for the deliverable were implemented on time.

5.2 Use of resources

Compared to the estimated budget for the action (Annex 2 of the grant agreement) following changes have been made to the budget:

- On 27 February 2017, article 6.2.E of the MGA changed. It was specified that “Beneficiaries receiving an operating grant financed by the EU or Euratom budget cannot declare indirect costs for the period covered by the operating grant, **unless they**

can demonstrate that the operating grant does not cover any costs of the action.”

The change of article could be applied retroactively. IFOAM EU receives a LIFE Operating Grant from the Executive Agency for Small and Medium-sized Enterprises (LIFE15 NGO/SGA/BE/100043 for 2016 and LIFE16 NGO/SGA/BE/200043 for 2017). According to the change in article 6.2.E., it was decided that from 1 January 2017 IFOAM EU would demonstrate that the LIFE Operating Grant does not cover any costs of actions financed by other EU funds, including OK-Net Arable. This is not the case for costs incurred in 2016. Therefore, IFOAM EU does not claim indirect costs incurred in the period September-December 2016. Direct costs in the period September-December 2016 were EUR 19,546.83, which corresponds to EUR 4886.71 indirect costs not claimed.

- In Annex 1 it was foreseen that AIAB works with 5 experts that contribute in-kind to the project against payment. In the second reporting groups, the Steering Committee decided that the expertise of Annegret Schmitt, Ursula Wenthe and Mait Kriipsalu was not anylonger in line with the project needs and expectations of the farmer innovation groups. It was therefore decided not to continue their contract. Only the contracts with Paolo Barberi and Christine Watson were continued. As already indicated in the first periodic report, the costs of Paolo Barberi (EUR 5000) are considered costs of natural persons working under a direct contract with AIAB. Only the costs of Christine Watson (EUR 3899.57) are reported as in-kind contribution.
- EUFRAS and linked party VLK had limited capacity to implement project activities. The main reason for this was that the person in charge for OK-Net Arable at EUFRAS went on maternity leave from March 2017 onwards. Therefore, it was agreed that EUFRAS would only implement a limited number of activities to promote OK-Net Arable within the network of advisers of EUFRAS. Two EUFRAS advisers also participated in the exchange visit in Austria. The limited number of activities explains the limited costs reported (EUR 5445.58)
- In the first reporting period, it was decided that Bioland would take over tasks from FiBL Projekte. The transfer of tasks corresponded to 6 person-months and staff costs of EUR 40,200 as well as EUR 2550 of travel costs. However, Bioland did not need all these additional personnel costs. The fact that only one organisation (Bioland) was responsible for the coordination of the German farmer innovation group meant that it could be done more efficiently, and less resources were needed. Staff costs were EUR 51,834.39 compared to EUR 66,847.79 still available in the second reporting period.
- The Estonian Organic Farming Foundation decided not to do practical testing activities in WP2. Therefore, less resources were spent than planned (total costs EUR 40,474.80 compared to EUR 64,440.17 still available in second reporting period)
- In the second reporting period several improvements were made to the farmknowledge platform, e.g. pages with reports of the practical testing activities were added (see deliverable D4.3 for full a description of all changes). In order to implement these changes, ICROFS needed more staff cost. The Steering Committee therefore allowed ICROFS to spend EUR 15,000 more personnel costs which was transferred from the budget of other partners that spent less budget.

- Bioselena was a very active partner. They did two practical experiments (roller-crimper and comb harrow, see section 1.2.2 above) and translated 4 tools into Bulgarian. Therefore, the Steering Committee decided to grant Bioselena more budget than originally foreseen. Total budget spent in the second reporting period is EUR 25,349.90 compared to EUR 15,379.80 originally available.