Organic Knowledge Network Arable

OK-Net Arable

Online knowledge platform

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Author(s)	*Ilse A. Rasmussen, Allan Leck Jensen*
Contributors	*Helene Kristensen, Margit Styrbæk Jørgensen, Bram Moeskops*

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Executive summary

The OK-Net Arable project has launched a platform aimed at filling the gap in the exchange of information between farmers across Europe. Farmers' needs were taken into account at every stage of development in order to make it easy for them to use. The platform is available in 10 languages (English, Bulgarian, Danish, Dutch, Estonian, French, German, Hungarian, Italian and Latvian) and the solutions are divided according to the most relevant topics in organic arable farming: Soil quality and fertility, nutrient management, pest and disease control, weed management and solutions for specific crops. Not only can farmers and advisors find solutions and engage with each other, they can also propose solutions. The intention is that this will help fill the current gap in the exchange of farmers' knowledge.

The complexity of organic farming requires farmers to have a very high level of knowledge and skills. But exchange on organic farming techniques remains limited. Working together with farmers and farm associations OK-Net Arable will make practical organic solutions available to farmers, and at the same time provide them with the technical means to discuss how it works on the field in their geographic and climatic conditions. This should empower farmers to engage in the improvement of the solutions and, in the end, to increase productivity and quality in organic arable cropping all over Europe.

The web platform is part of the OK-Net Arable project, which is coordinated by IFOAM EU and involves 17 partners from 12 countries throughout Europe. The project is financed by Horizon 2020, the EU's main funding instrument for research and innovation. OK-Net Arable is one of the first four so-called thematic networks funded under the umbrella of the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI). This policy instrument aims to foster innovation by connecting farmers and researchers. OK-Net Arable started in March 2015 and will run until February 2018.

Farmers play a prominent role in all stages of the project, making OK-Net Arable very innovative among projects of its kind. Much more than being asked for advice, farmers engage in a process of co-creation throughout the project. This work is facilitated by 14 farmer innovation groups.

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1 Introduction

The aim of the OK-Net Arable project is to improve the exchange of innovative and traditional knowledge among farmers, farm advisers and scientists to increase productivity and quality in organic arable cropping throughout Europe, and to improve their environmental performance, in order to satisfy citizen and consumer demands.

The project has three specific objectives: 1) to create a European network of well-functioning organic arable farmer innovation groups representing the best examples of co-innovation by farmers and researchers; 2) to digest and synthesize scientific and practical knowledge about organic arable farming to identify best practices (the project will develop and test innovative practical and educational material based on this information); 3) to create a European platform for knowledge exchange focusing specifically on organic arable farming drawing on experiences from diverse contexts. The project consists of 4 work packages.

As part of work package 4, "Knowledge platform and communication", one of the main objectives is to produce an online knowledge platform, where organic farmers and advisors can find information about relevant practices, can comment and discuss these practices and even suggest new practices to be found on the platform.

General objectives of WP4:

To establish a permanent online platform for knowledge exchange among organic and low-input farmers and their advisory services, and to disseminate the project outcomes.

Specific objective related to the launch of the online platform:

1. To develop an easy-to-use online open-access knowledge platform with a tool box, a discussion forum and a project website.

Work planned in task 4.1 related to the launch of the knowledge platform:

Based on experiences with existing knowledge platforms and input from IFOAM EU, AU/ICROFS will develop and set up the open-access on-line knowledge platform. It will feature (a) an extendable tool box for depositing end-user and education materials, (b) a discussion forum for multi-actor communication and c) the project website. AU/ICROFS will translate all the desired features of the platform into technical requirements guiding the actual set-up.

(a)The tool box will present all the education and end-user material developed by the combined efforts of WP2 and WP3 plus evaluation of their usability and potential for implementation across Europe. The tool box will not contain the materials as such, but will link to the relevant archives/locations. Depending on the typology of the material it will be deposited in Organic Eprints (www.orgprints.org, international open access archive for papers and projects related to research in organic food and farming) or in other databases (e.g. in the case of video clips, on YouTube). If relevant, Organic Eprints will be further developed by AU-ICROFS making it more user-friendly as regards depositing of end-user and education materials, which it currently does not include.

(b) The discussion forum for multi-actor communication and learning will serve to discuss experiences with the end-user material as well as getting suggestions from users on other relevant material and how its use can be promoted. Rather than developing a new discussion forum from scratch, AU/ICROFS will integrate an existing discussion forum module in the platform. Which kind of module is most suitable will be decided based on input from WP3 (knowledge exchange methodology) and the 2nd SCAR-AKIS report, which evaluated various existing discussion forums for multi-actor communication and learning. AU/ICROFS will ensure that synergies are created as much as possible between the knowledge platform and already existing knowledge hubs for the organic and low input farming sector such as Organic Eprints and Organic

Edunet (portal with digital learning resources; http://portal.organic-edunet.eu/en) as well as the EIP-AGRI website. The website will be made in English, but translation will be provided with help from Google Translate or similar.

(c) The project website will contain basic information regarding partners, aims of the project and deliverables. It will inform users and interested stakeholders about the progress of the project. Whilst a certain time is needed to develop the knowledge platform with the tool box and discussion forum, the project website will be set-up already at the start of the project by AU/ICROFS. It will be ensured that the project website is user-friendly and Search Engine Optimised. AU-ICROFS will integrate the project website in the knowledge platform once that is ready.

Before the actual launch of the knowledge platform, a beta-version will be made (M12) to be tested by all partners for functionality and usability. Problems encountered during the testing phase will be corrected by AU-ICROFS and the platform with tool box, discussion forum and website will be ready by M16.

2 The knowledge platform

2.1 Development process of the knowledge platform

The development of the beta-version of the online platform (Milestone MS8) was timely and technically ready on 1March 2016. However, the Steering Committee decided to perform a practical evaluation of the discussion forum and also to wait for the selection and description of the first batch of tools, so that real tools could be shown in the beta-version. Therefore, the launch was postponed until the end of June. It was planned that the project participants should have evaluated the beta-version in July and afterwards AU/ICROFS should have implemented the required improvements in August, so that the first version of the platform could be launched on 1 September 2016.

However, on 19 July while the developers of AU/ICROFS were on holiday, it was discovered that hackers had used vulnerabilities in Joomla to hack the web server. The web server had to be closed down and the platform had to be built up again, more or less from scratch. This was completed and the evaluation could be recommenced on 9 August, but at that point in time many of the evaluators had started their holiday, causing further delay. Subsequently, steps have been taken to overrule the vulnerabilities in Joomla to avoid repeated hacking.

2.2 The knowledge platform

The online knowledge platform is publically accessible on the web site farmknowledge.org . The entrance page is shown in Figure 1.

The knowledge platform has the features described in the application:

- “AU/ICROFS will develop a permanent, open-access, online knowledge platform”
- “It will feature an extensible tool box for depositing end-user and education material”
- "It will present all the education and end-user material developed by the combined efforts of WP2 and WP3 plus evaluation of their usability and potential for implementation across Europe".
- “It will feature a discussion forum for multi-actor communication. AU/ICROFS will integrate an existing discussion forum module in the platform”
- "It will make it possible for users to give suggestions for other relevant material"
- " AU/ICROFS will ensure that synergies are created as much as possible between the knowledge platform and already existing knowledge hubs for the organic and low input farming sector such as

Organic Eprints and Organic Edunet (portal with digital learning resources; http://portal.organic-edunet.eu/en) as well as the EIP-AGRI website."

- "The website will be made in English, but translation will be provided with help from Google Translate or similar"
- "AU/ICROFS will integrate the project website in the knowledge platform"
- "The project website will contain basic information regarding partners, aims of the project and deliverables"
- "It will inform users and interested stakeholders about the progress of the project"
- "It will be ensured that the project website is user-friendly and Search Engine Optimised".

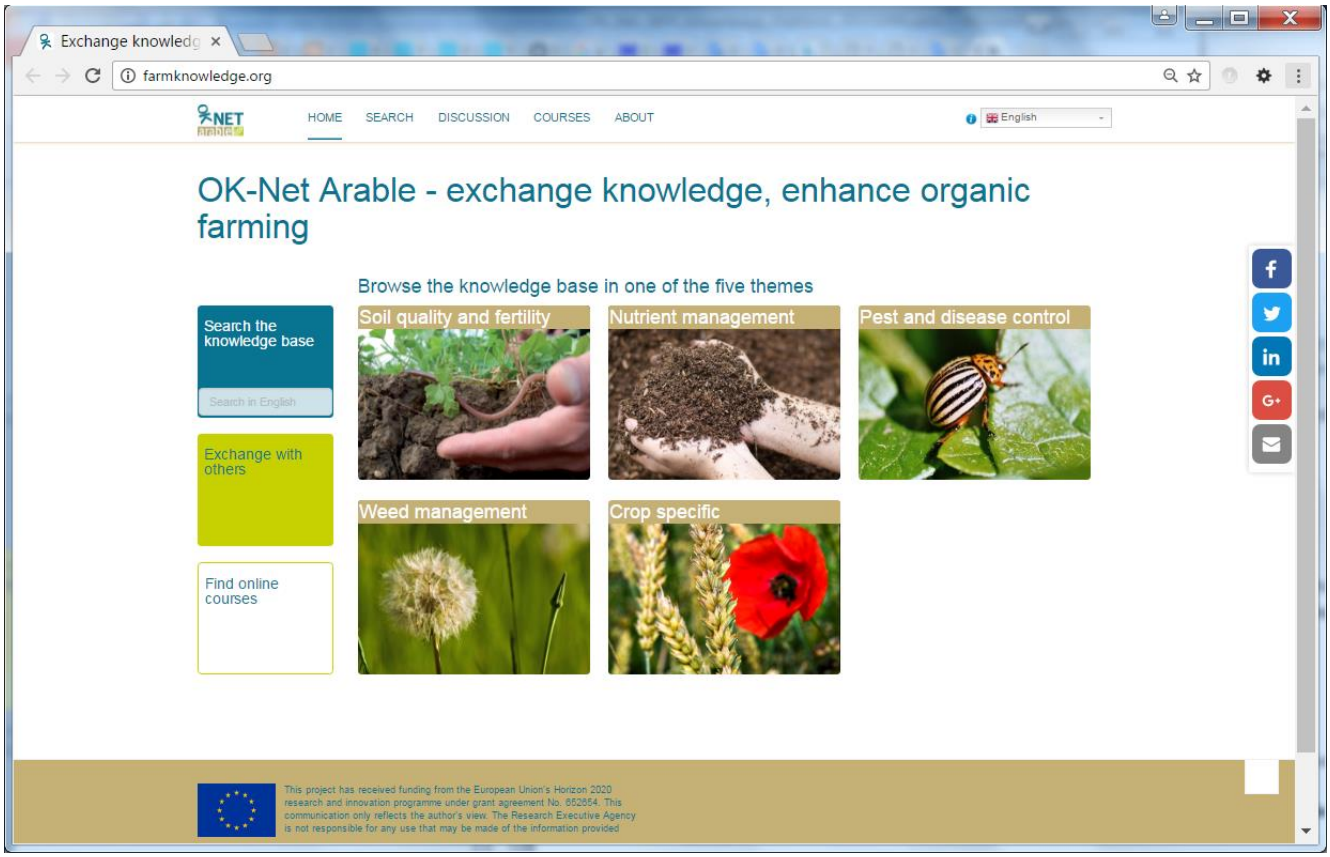

Figure 2. The entrance page of the farmknowledge.org platform

2.3 A permanent, open-access, online knowledge platform

A web server has been purchased, the open-source operative system Linux has been installed on the server, and a range of domain names has been purchased and set up (including farmknowledge.org for the platform and ok-net-arable.eu for the project web site). Additional software including the open-source Content Management System (CMS) Joomla has been installed to manage the web pages of the website. An important reason to select Joomla was that TP-Organics used it and it enabled close collaboration about material and styles in a so-called multi-installation. Later, however, TP-Organics has decided to use another CMS. Still, TP-Organics and Farmknowledge share the selection of colours used for logos and web pages (Figure 2).

Figure 2. Logos of OK-Net Arable and TP organics

It is of great importance that web pages are *responsive*, which means that the contents of the pages re-arrange automatically and in an intuitive way, depending on the size of the screen (mobile, tablet or computer). See for example a part of the entrance page displayed on a mobile phone in Figure 3. In order to obtain responsiveness, the Joomla template Purity III was selected.

Figure 3. Screenshot of the platform on a mobile phone

2.4 An extensible tool box for depositing end-user and education materials

The extensible tool box currently contains 31 tools, which have been described with metadata in a database. A user interface (http://farmknowledge.org/index.php/search-for-ok-tools) enables users to search the database for tools on a specific topic, of a specific type (say videos), in a specific language, etc. The search page lists the search results as links (Figure 4), where each link describes a tool which the user can download, just as it provides comments or discussions of the tool.

Figure 4. List of the current 31 tools in the platform

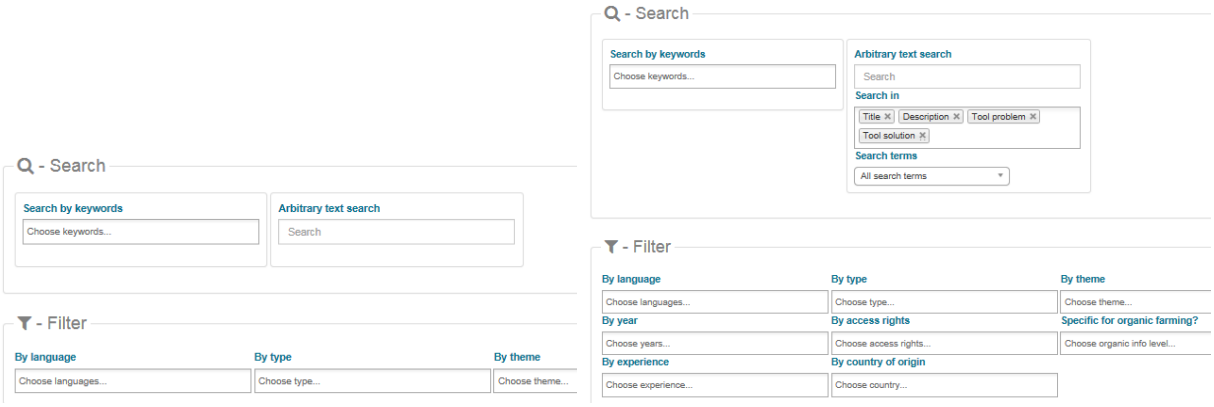

Figure 5. Search page of the platform. Left: simple search. Right: advanced search

The search is first shown as a simple search (Figure 5, left). However, it is possible to click "Advanced search" (Figure 5, right) and get all search possibilities.

Figure 6. Example of a tool page

The page for presentig tools is displayed in Figure 6. For each tool there is

- The title of the tool
- A picture (screenshot) of the tool with a link directly to the tool itself
- An icon with the type of the tool is shown at the top to the right (in this case, a leaflet)
    - There are seven tool types, see Figure 7. A designer was hired to design the icons.

Figure 7. Icons for types of tools

- In the left column:
  - Description of the problem, the tool can be used for
  - Description of the solution
  - A description of the tool
- In the right column, the applicability of the tool is shown. When not expanded (Figure 6), this shows
  - Theme
  - Language
- When expanded (Figure 8), in addition it shows
  - Keywords
  - Year of release
  - Country of origin
  - Issuing organisation with link to the tool and e-mail to the organisation
  - Access (whether it is open access or restricted e.g. to members)
  - Specificity for organic agriculture
  - Whether it is mostly for new organic farmers or also for experienced organic farmers
  - Length (pages) of the tool (if applicable)

Figure 8. Applicability box expanded

Each tool is specified in Organic Eprints and only the metadata of the tools are mirrored to the farmknowledge platform. This makes it possible to link to related material in Organic Eprints, see top right in Figure 6. While the metadata are mirrored, additional material, e.g. a document, is stored in Organic Eprints, except web-based tools, where only the link is stored, or video material which is stored on YouTube or similar services.

Figure 9. Example of related material in Organic Eprints (cut off at the bottom).

2.5 Development of Organic Eprints

Organic Eprints was originally created as a document archive related to research in organic food and farming. While this included documents and other types of information intended also for dissemination to the end-users, the definition was that it should be based on research, so mainly researchers have deposited material. Gradually, it has become evident that Organic Eprints would also be relevant as an archive for publications about organic agriculture which were meant directly for dissemination to the end-users, and thus maybe not directly based on research. Thus, Organic Eprints already contains more than 1500 documents which could be relevant for end-users such as farmers and consultants, see Figure 10.

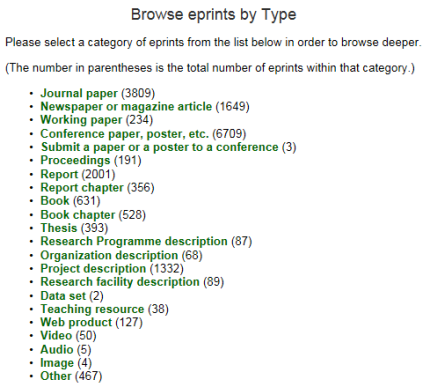

Figure 10. Number of deposits in Organic Eprints of different eprint types

As a part of the OK-Net Arable project, the metadata of the tools presented in the platform are entered into Organic Eprints, and if applicable, the document or other information about the tool is entered as well. In order to do this, it has been necessary to adapt Organic Eprints to be able to store the required information. This was done on a test server in order to exclude the risk of disturbing the existing use of Organic Eprints. During the summer 2016, Organic Eprints was updated to a new version and at the same time moved to a new server environment at Aarhus University. Unfortunately, it was not possible at the same time to update the test server so that the changes to Organic Eprints, necessary for the OK-Net

Arable tools, could be tested in the new environment. Because of this, the required changes to Organic Eprints have not yet been carried out on the live server, however, it is expected that this can be done in the very near future.

2.6 A discussion forum for multi-actor discussion

Several possibilities for integration of discussion fora have been investigated and tested. The best possibility turned out to be the module from Disqus. The greatest advantage is that the multi-actor discussion is maintained within the platform, rather than outside on various social media like Facebook or Google Plus. It is necessary to be registered in order to participate in the discussion, but Disqus makes it possible to log in with an existing account for Facebook, Twitter or Google Plus or to create a new account in Disqus.

It is possible to participate in general multi-actor discussions about the five themes: Soil quality and fertility, Nutrient management, Pest and disease control, Weed management and Crop specific. In addition to this, there is a specific discussion for each tool. Figure 11 shows a test discussion in the Soil quality and fertility theme.

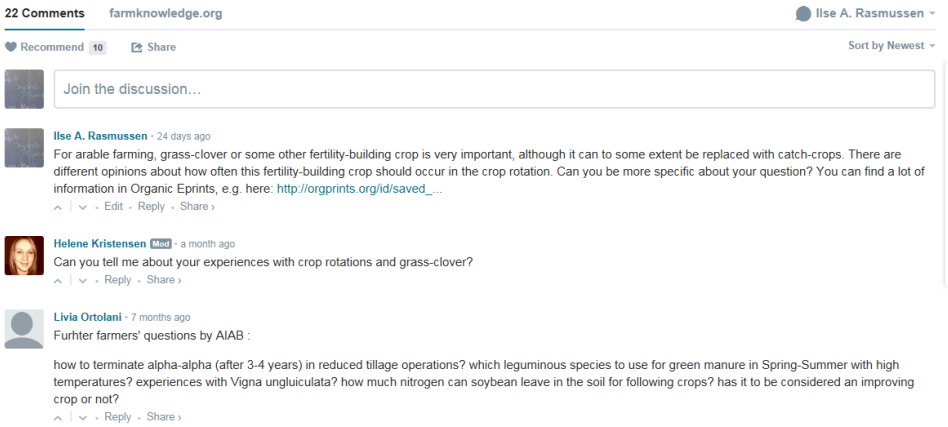

Figure 11. Example of a test discussion about the Soil quality and fertility theme in Disqus

In the discussion, it is also possible to make comments about tools, which are not in the platform. However, in order to make it easy for users to suggest new tools, and for the administrators to notice these suggestions, on each theme and tool page, there is a "tip-a-tool" box and link, see Figure 12 and Figure 6, bottom left.

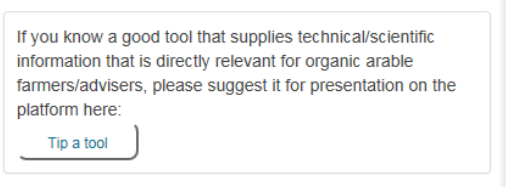

Figure 12. "Tip-a-tool" box

2.7. Synergies with existing knowledge hubs

Synergy has obviously been created with Organic Eprints through the tools being deposited there, but also through the search for related material in Organic Eprints (see Figure 6, top right). Synergy with the EIP-

AGRI website has been created through using the same keywords that are being used by EIP-AGRI. Synergy with other existing knowledge hubs has been created by including them as tools, see Figure 13.

Figure 13. Tools that are knowledge hubs for organic farming

2.8 Translation by Google Translate

A Joomla module for Google Translation has been implemented and specified to allow translation into the ten languages of the project participants (Figure 14). The module has been improved to allow it to remember the selected language across web pages and to show the selected language.

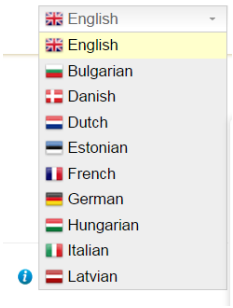

Figure 14. Selection of language for translation by Google Translate

Figure 15. Example of theme page translated into German

It is a well-known fact that automatic translation facilities, such as Google Translate, are far from perfect, even though they are constantly improving. Unfortunately, with regard to the knowledge platform examples have also been found where the translation performed by Google Translate is incorrect or misleading. This has led to the need to develop additional translation facilities to mitigate cases with unsatisfactory translations, in order to improve the usability and user friendliness of the knowledge

platform. The facilities Cross-language keyword search, Cross-language arbitrary text search and Controlled translation are described below.

2.8.1 Cross-language keyword search

One of the most important methods used to search for tools is by using keywords, as each tool is annotated by a set of keywords. A selection of 100 possible keywords has been made in collaboration with EIP-AGRI. It has been the purpose to have enough keywords to describe all tools, and yet not so many that keywords can be almost synonymous. All keywords have been translated into the ten languages and made available in a database. The cross-language keyword search enables a user to search for tools using keywords in his/her own language even though the tools are described only with keywords in English. This is possible due to the coupling of the translated keywords (Figure 16).

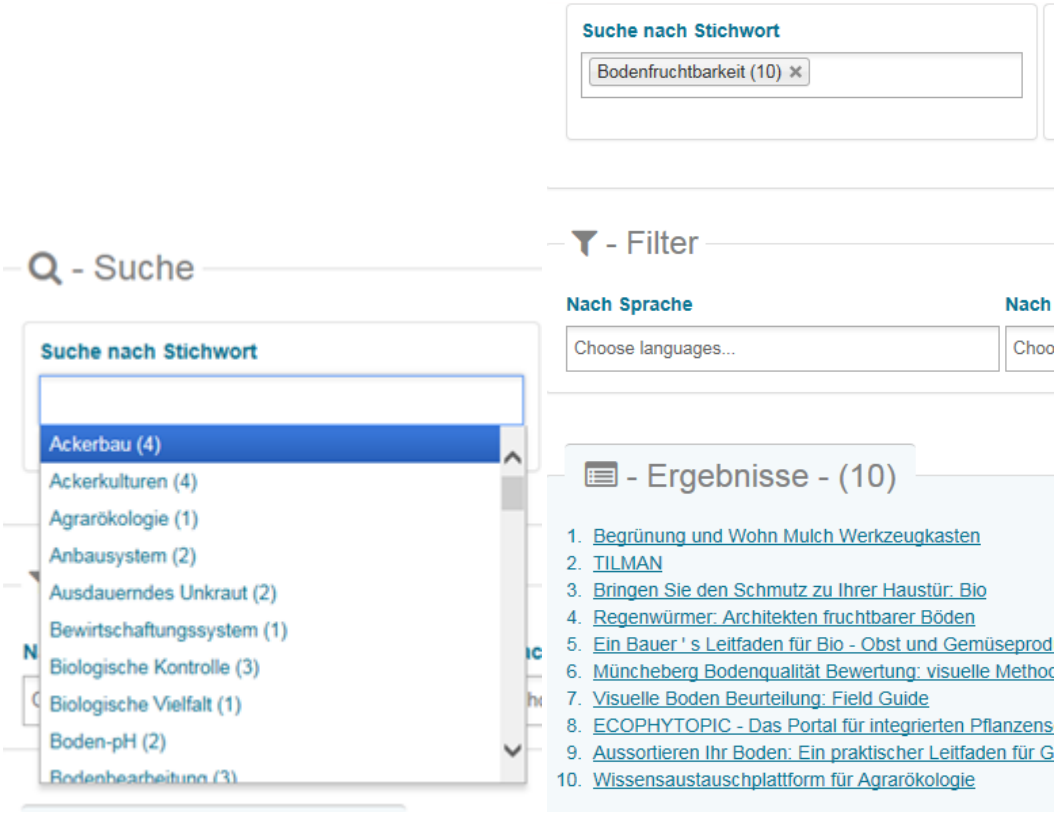

Figure 16. Example of a keyword search in German, left: search terms, right: results of search

2.8.2 Cross-language arbitrary text search

Arbitrary text search is performed as a free text search in various data fields belonging to each tool. In cases of non-English user languages - the search words will be google-translated from the selected language into English, e.g. the German search phrase “unkraut” will cause the search engine to look for tools containing the text “weed” in the designated data fields.

As default the data fields used for this search are the “title”, “description”, “tool problem” and “tool solution” fields, and they can be viewed and managed by selecting “Advanced search” .

If the search phrase contains more than one word/term, the search can be further refined by demanding that all of the search terms be contained in the searched data fields (Figure 17).

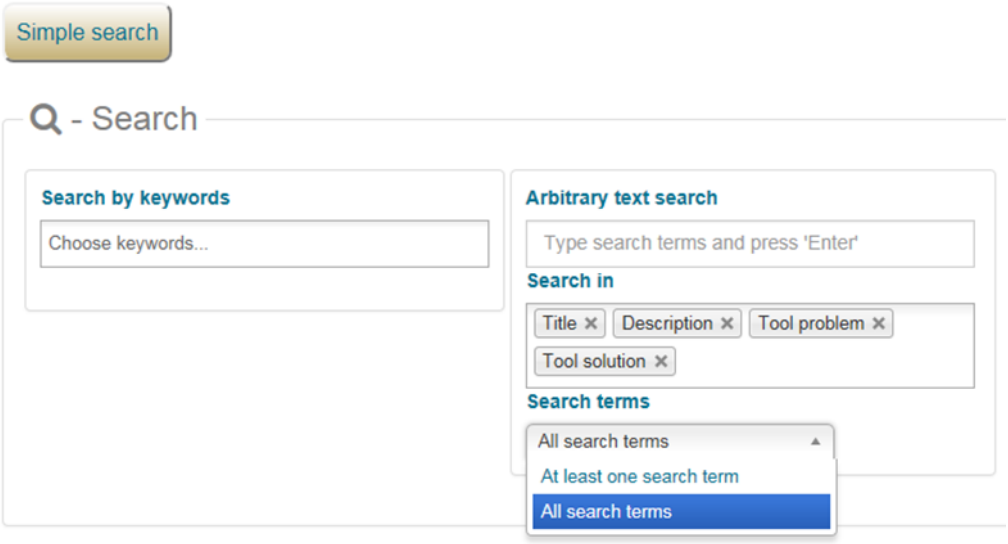

Figure 17. Search with cross-language arbitrary text search and choice of all or any search terms

Once the user has chosen a language, this search can also be carried out using that language from the front page, see Figure 1.

2.8.3 Controlled translation

Controlled translation is a facility to overrule the Google translation in cases where it is misleading and in crucial places. For example, Google translates the theme name 'Nutrient management' into ''nährstoff~~POS=TRUNC' in German (https://translate.google.com/#en/de/Nutrient%20management, last tested on 28-09-2016). Therefore, phrases like 'Nutrient management' have been labelled in the HTML code and a facility has been developed to overrule Google's translation of these phrases by our own translations. The translation of phrases is done on a protected web page by selected translators of each language. However, if the responsible person is satisfied with the translation by Google translate, they do not need to make a translation, the system will just keep that which is carried out by Google translate. At present, there are 33 such phrases which can be translated to the 10 languages, but the translators (and others) can suggest new terms to be translated. This translation process slows down the platform a little, so the intention is to keep the number of translated phrases as low as possible.

2.9 Additional features

In addition to those mentioned above, two other facilities, which were not described or budgeted in the application, have been developed, as described in the following.

2.9.1 Sharing on social media

It is possible for users to share pages of the knowledge platform, e.g. tool descriptions on selected social media: Facebook, Twitter, LinkedIn, Google Plus and e-mail, see Figure 18 and Figure 3. In this way awareness of the platform and its tools can be improved.

Figure 18. Toolbar for sharing the pages of the knowledge platform

2.9.2 Tool rating

Users are encouraged to give their ratings to the tools in terms of 1 to 5 stars (see Figure 19). The personal ratings are remembered on their own computer so that it is possible to view and change the rating at later sessions. The ratings are also stored in a database, so that the average rating and the number of ratings can be displayed for each tool. In this way it will (soon) be possible to show the tool with the highest average rating within each theme.

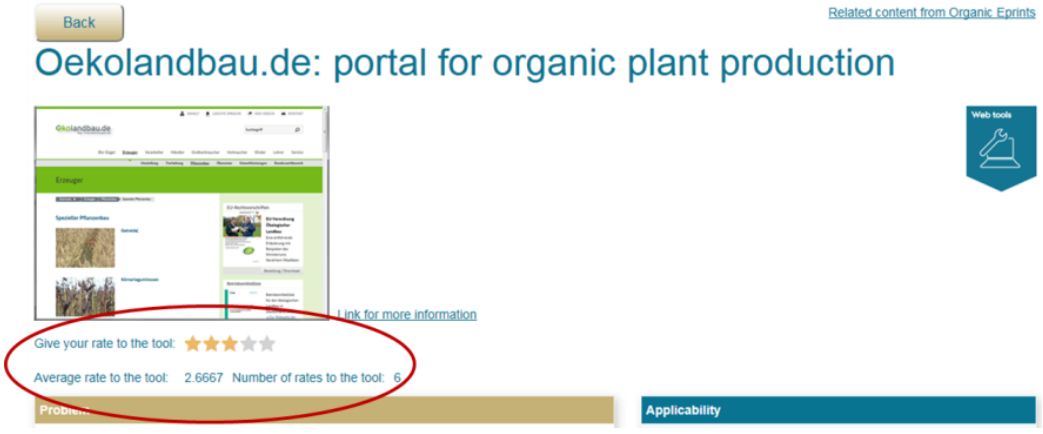

Figure 19. Rating system with stars for the tools

2.10 Project website

From the knowledge platform, on the "About" page, there are links to the project website: www.ok-net-arable.eu, see Figure 20.

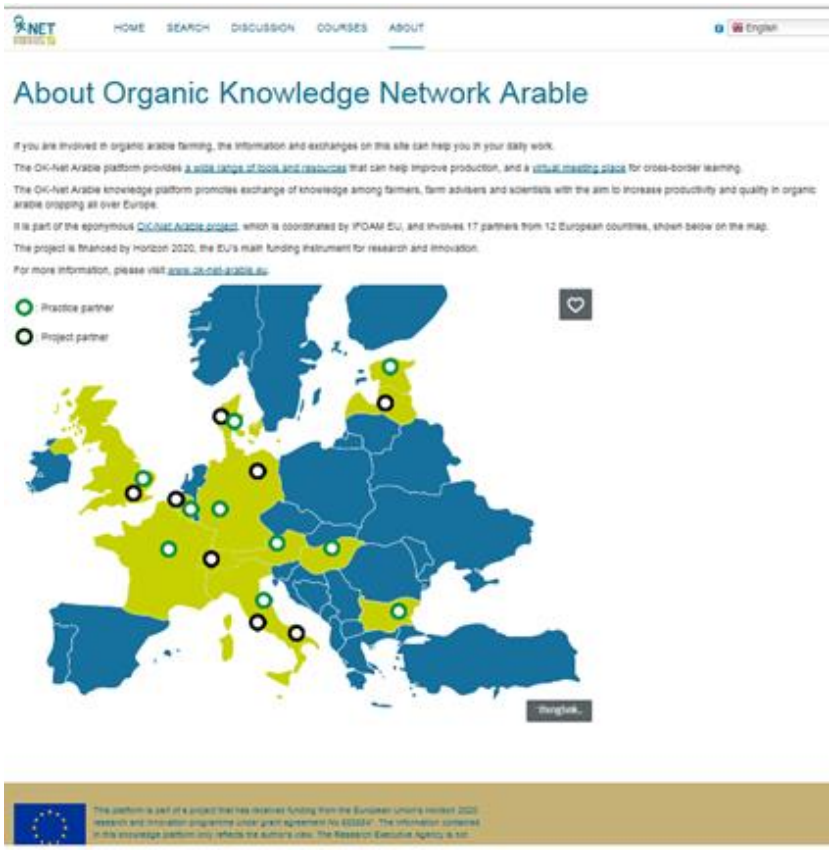

Figure 20. "About" page on knowledge platform with links to the project website

Figure 21. Front page of the OK-Net Arable project website

The project website was launched timely on 25 May 2015. The project website contains information about the project partners and the objectives and target groups of the project. It shows news and publicity about the project and has links to (public) deliverables from the project.

On the website, a link to the EIP-AGRI website can be found.

2.10.1 A user-friendly project website

AU/ICROFS has focused on making a user-friendly website, which means that the structure, content, navigation and functionality on the website are compatible with its intended user's ability to manoeuvre easily and successfully on the site.

The menu on the project website has the following structure (see also Figure 21):

- **About**
- Objectives
- Target groups
- Project partners
- Steering committee
- Farmer innovation groups
- Publicity
- News
- Deliverables from project
- Contact

Already when the user enters the front page of the website he/she is informed what the project is about. The website user is also met by the latest news story from the project. On 3 October 2016 the user found a press release about the launching of the new platform. The subheading includes a link to the platform, making it easy for the user to be redirected to the platform from the project website.

All pages on the project website have short clear descriptions with links to relevant documents and pages, making it easy to understand the content and the purpose of the project and making it easy to find relevant information.

The website has been tested by the project partners. After this the website was adjusted to fit the demands.

It is planned to make a widget/link to the knowledge platform on every single page of the website making it easy for the website user to find a link for the platform, thereby increasing the traffic to the platform.

2.10.2 Search Engine Optimization (SEO) on the project website

SEO is the process of affecting the visibility of a website and generating traffic from the “free” or “editorial” search results on search engines; in other words payment isn’t involved.

All major search engines such as Google, Bing and Yahoo have primary search results, where web pages and other content such as videos are shown and ranked based upon what the search engine considers most

relevant to users. With SEO as a marketing strategy of the project website, AU/ICROFS has considered what people search for, i.e. the actual search terms or keywords typed into search engines. Both keywords and short descriptions of the most important content and relevant search terms are inserted on every single page on www.ok-net-arable.eu in the metadata of these pages (in the meta descriptions and meta keywords section in the back-end of the CMS-system). This makes the www.ok-net-arable.eu site friendly to search engines.

Another strategy that affects the ranking in search engines is the use of backlinks; a backlink for a given web resource is a link from other websites to that web resource. The quantity and sources of backlinks for a web page are among the factors that Google's PageRank algorithm evaluates in order to estimate how important the page is. The fact that all project partners have contributed with articles about the project on their own websites and shared it with others websites (including links, referring to www.ok-net-arable.eu); the website has a lot of backlinks.

When you search for 'OK-Net Arable' on Google.com, the website www.ok-net-arable.eu is the first to be mentioned on the list. Potentially, when you search e.g. "organic arable" or "organic arable farming", the aim is that it will be one of the hits on the first Google search page.

AU/ICROFS suggests using SEO on the knowledge platform too. This will be done along the way, also as more tools will be posted on the platform. The purpose of SEO in this connection is both making it easy for web users to find the platform and also the specific tools.

3 Conclusions and perspectives

With only a short delay, the planned knowledge platform has been developed and launched to the public. It contains all the features described in the project application, and even some extra. The project website was created very early in the project and is now integrated in the knowledge platform.

In the immediate future, the plan is to keep the knowledge platform updated, e.g. with smaller changes suggested by the project partners and correction of any flaws and defects that may be detected through the use. In order to increase the use of the knowledge platform, the plan is to Search Engine Optimize each tool page so that it will be prominent in any Google search on the subject. In addition, small i-frames will be created for each partner to insert on their website with a search that leads directly to the knowledge platform.

There are further plans to add more tools from the work of WP2 and 3 and also via input from users (the "tip-a-tool" box). The practise abstracts about the use of the tools being made in WP2 and WP3 will also be included. In addition to the title, a "teaser" with information calling for interest of users will be added to each tool. It is also under consideration that on each theme page, the top rated tool (or several) can be shown together with a tool recommended by the OK-Net Arable team. It is also under consideration to make searches for relevant material in other databases than Organic Eprints, e.g. EIP-AGRI, Organic Edunet and others.

The discussion on the platform will be moderated by IFOAM-EU with input from all partners and the scientific experts from WP3.

In the longer perspective, it has been an important part of setting up the knowledge platform, that it is extensible. This means that it is tehcnically prepared so that other subjects than organic arable farming can be added, e.g. organic animal husbandry, if it is found relevant and can be funded.

4 References

Knowledge platform http://farmknowledge.org/ accessed on 3rd Oct., 2016

Project website http://www.ok-net-arable.eu/ accessed on 3rd Oct., 2016