

eip-agri
AGRICULTURE & INNOVATION

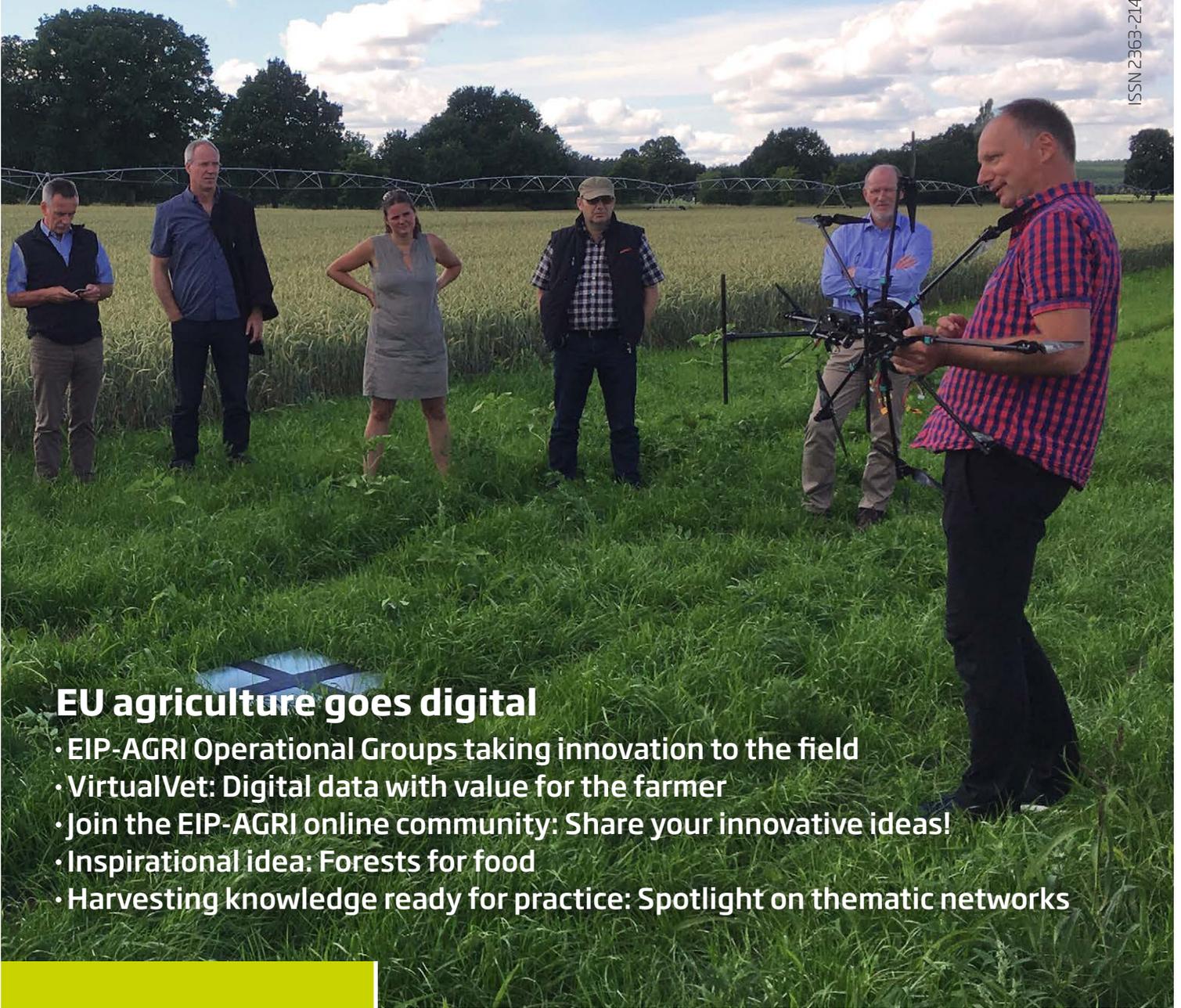
agri innovation

WHERE RESEARCH AND PRACTICE MEET

2018

5

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EU agriculture goes digital

- EIP-AGRI Operational Groups taking innovation to the field
- VirtualVet: Digital data with value for the farmer
- Join the EIP-AGRI online community: Share your innovative ideas!
- Inspirational idea: Forests for food
- Harvesting knowledge ready for practice: Spotlight on thematic networks



SLOVENIA: Focus Group field visit for resilient forests

FRANCE: Exploring protein autonomy on the farm

FINLAND: Satellites and sensors for soil decision support

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Table of contents

| | |
|--|----|
| | |
| Welcome | 3 |
| | |
| Operational Groups: taking innovation to the field | 4 |
| | |
| Digital tools for efficient irrigation in orchards | 7 |
| | |
| EIP-AGRI Focus Groups: innovation through expert eyes | 8 |
| | |
| Thematic networks: harvesting knowledge ready for practice | 10 |
| | |
| Digital technologies for smarter farming | 12 |
| | |
| GrassQ: ICT research for better grassland management | 14 |
| | |
| EU space programmes: satellite support for future-proof farming | 15 |
| | |
| VirtualVet: farm data for animal health traceability | 16 |
| | |
| Horizon 2020 multi-actor projects: joining forces to create solutions with more impact | 18 |
| | |
| Protein autonomy on the farm | 20 |
| | |
| Forests for food | 21 |
| | |
| SHARE your ideas and needs for innovation | 22 |
| | |



Welcome

Agriculture is updating! Version 4.0 is already a reality, and the sector urgently needs to rethink itself to cope with the pace of the digital (r)evolution.

Digital technologies can support European farmers to “achieve more with less”. They also hold the promise to address current and future challenges, from climate change, responsible use of scarce natural resources, to food security. Existing and new technologies such as the Internet of Things, artificial intelligence, robotics and big data can contribute to making processes more efficient and can lead to the creation of new products and services.

In the past years, the EIP-AGRI has carried out much work to lay the foundations for the development of a fully digitised and data-empowered European agricultural and forestry sector. Supported by rural development (EAFRD) and research funding (Horizon 2020), an increasing number of research and innovation projects and initiatives have seen the light and have started connecting across EU borders, thanks to the EIP-AGRI Network. In this edition of Agrinnovation - the Network's yearly magazine - we have taken the opportunity to provide a glimpse into this exciting universe, where cows talk to computers (via sensors, of course) and drones collect soil information while farmers are busy developing their new ideas. You will find some interesting examples of running projects and the people behind them, to be inspired and to find opportunities to exchange or work together!

A number of EIP-AGRI Operational Groups are already using digital technologies to develop innovative solutions for practical problems or opportunities in the farming sector. Around 10% of all ongoing Operational Groups work on precision farming or digital-based solutions. Some examples are featured in this magazine.

Following the motto “connecting research and practice”, the EIP-AGRI is bringing together Operational Groups and other needs-based and farmer-driven innovative projects with the broader knowledge and networks offered by Horizon 2020 projects. Thanks to the interaction between these two worlds, users are helping to shape digital technologies to fit their needs, so that EU farmers are not only spectators but actors (and directors!) of this digital transformation.

In this edition of Agrinnovation magazine you will find more inspirational stories, news and updates from the EIP-AGRI Network. Did you know, for instance, that more than 600 EIP-AGRI Operational Groups have already been selected or have started? These projects are the backbone of the success of the EIP-AGRI Network. Check out the dedicated Operational Groups area on the EIP-AGRI website, also featuring an interactive map of Operational Groups that are up and running. You will find a sneak preview on the backcover of this magazine.

I hope that you will enjoy browsing this issue of Agrinnovation ... digitally or not!



Kerstin Rosenow
Head of Unit Research & Innovation
Directorate-General for Agriculture and Rural Development



Operational Groups: taking innovation to the field

EIP-AGRI Operational Group projects bring together partners from practice and research to find innovative solutions for concrete challenges in European farming and forestry. All Operational Groups can benefit from exchanging knowledge and collaborating with organisations from outside their project, such as other Operational Groups, farmers' associations, research projects and others. This can help them spread innovation and have it taken up in the field.



Pocketboer - Biogas energy on the farm

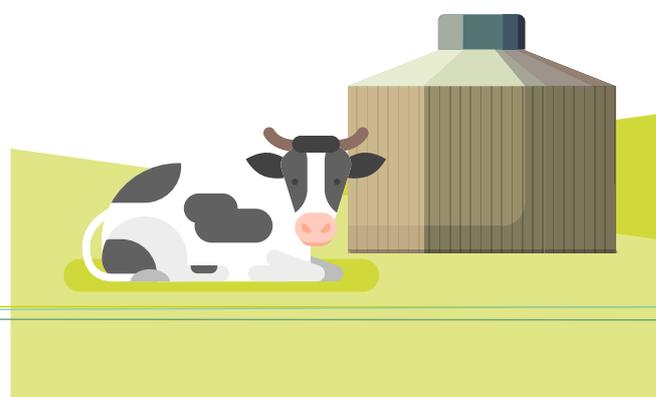
More and more farmers in Flanders, Belgium are using small-scale ('pocket') anaerobic digesters on their farms, to produce biogas energy from cattle slurry. Because the technology is fairly new, the Operational Group Pocketboer is tapping into the experiences of dairy farmers who are already using pocket digesters, to find solutions for common problems and improve performance.

The Pocketboer partnership includes 6 farmers, a number of research and knowledge centres, and a farmers' association, closely cooperating with a specialised biogas platform. "About half of the 72 Flemish farmers who apply this technology indicated that they were very interested in collaborating with the Operational Group", says project coordinator Anke De Dobbelaere (Inagro). "We invite them to regular meetings to discuss project results and share concrete problems, and we often have a good turn-out. By exchanging ideas and solutions, the farmers involved discover better

and cheaper ways of dealing with digester settings, biomass mixing times, and other issues. After seeing results from other farms, one of the farmers decided to adapt his mixing regime, this way reducing the energy consumption of the installation. Another farmer enlarged the volume of his digester following our advice relating to retention time. This allowed the feedstock to stay in the reactor for a longer time, which stopped problems with foaming and improved his overall results."

In addition to the regular meetings, farmers can post pictures or questions in a dedicated Facebook group, helping them to quickly solve specific problems.

- ▶ More information [on the website of partner Inagro](#) (in Dutch)
- ▶ Pocketboer closely cooperates with research project [Pocket Power!](#) exploring the same topic.





From left to right: farmer Ville Niskanen, ÄLYREHU coordinator Pekka Kilpeläinen, Piimaklaster coordinator Hardi Tamm, and adviser Eila Niskanen on a farm visit in Finland.



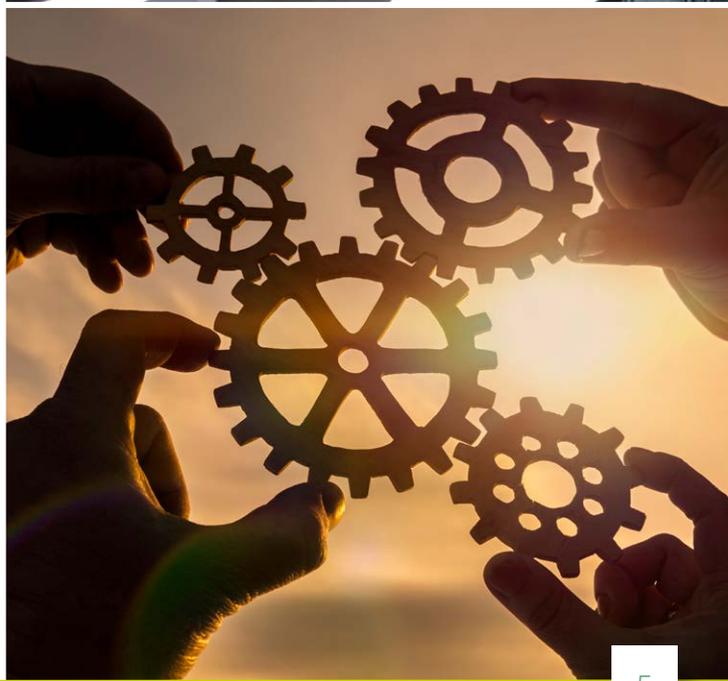
Transnational cooperation in Estonia

In December 2017, Estonia launched a call specifically for cross-border Operational Groups. The first call resulted in a number of approved applications with cooperation partners from Finland.

Hardi Tamm is coordinator of the Estonian Operational Group 'Piimaklaster' (Estonian Dairy Cluster). They have signed a cooperation agreement with the Finnish Operational Group ÄLYREHU. The Estonian project is developing an automated biosensing system to detect three of the most common bacteria causing mastitis in dairy cows. Their Finnish partner develops related technologies to monitor animal health, focusing on the analysis of nutritional markers in milk. The partners are going to organise on-farm pilot testing for each of the projects both in Estonia and in Finland.

Hardi Tamm: "Our experience so far has been very positive; everything has been arranged smoothly from both sides. Considering the 900 km distance between the coordinators, we have met face-to-face only twice, but we keep in touch through teleconferences and e-mails. I think both groups benefit from this transnational cooperation. Both countries have a strong capacity to develop digital tools. We are hoping that the collaboration can help to spread results more widely in agriculture."

► **More information:** [Estonian Operational Group Piimaklaster](#) (in Estonian) and [Finnish Operational Group ÄLYREHU](#)

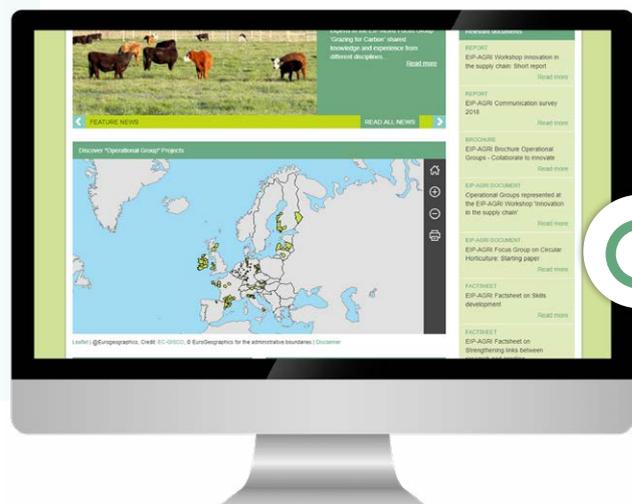




Managing Authorities of Rural Development Programmes can support Operational Groups in delivering results to farmers, advisers, and others that can actually use them in the field.

“We are organising seminars where Operational Groups can present their work to farmers and others benefiting from the results. We are visiting universities, farmers’ organisations and local administrations to explain what Operational Groups are and to share results. We also publish project outcomes and interviews with Operational Group coordinators on the [RuralCat](#) website.”

- Jaume Sió Torres, Catalan regional government -



- ▶ Over 600 Operational Groups have been selected or have already started (September 2018). More details, facts and figures on the [EIP-AGRI website](#).
- ▶ Did you know? The EIP-AGRI website has a dedicated area with information on Operational Groups. Browse the [Operational Groups database](#) or find projects from your country on the [interactive map](#).

- ▶ Many countries have set up national or regional databases listing Operational Groups that have been selected for funding. [Take a look!](#)

- ▶ More inspiration in the [EIP-AGRI brochure on Operational Groups](#) and the [brochure ‘collaborate to innovate’](#) ●



Inspirational idea



Water for agriculture

Digital tools for efficient irrigation in orchards

More than 65 Operational Group projects are currently dealing with issues related to water and agriculture. Most of these focus on irrigation or the protection of groundwater or surface water by testing or developing good agricultural practices. Some projects look at water reuse or water purification.

Water can be an issue for fruit producers in the German Brandenburg area, especially during the main growth phase of the fruit when plants may suffer water stress. In the Operational Group Aqua C+, three fruit growers, a research institute and a horticultural association are testing solutions and developing a support system for more efficient water use in orchards.

Project coordinator Andreas Jende explains: "Water demand varies for different stages of fruit development. We use soil maps, plant sensors and weather stations to collect information on the plants and their water balance at each different stage. All data are merged into an online information and advisory system that helps fruit growers see in real time exactly how much water is needed and when."

The system will be accessible by smartphone, allowing farmers to save water as well as time and money. Andreas Jende: "Fruit growers have been strongly involved in developing this system. They have been in close contact with each other and with the researchers, to discuss fruit cultivation, soil variability and more. Their data were essential input in developing a useful and practical online decision support system."

More information:

- ▶ www.aquacplus.de (in German) or in the [EIP-AGRI database](#)



- ▶ The [EIP-AGRI workshop 'Water and agriculture'](#) promoted knowledge exchange, networking and cooperation between Operational Groups and other types of projects that deal with water-related innovation in agriculture.
- ▶ Read more inspirational examples in the [EIP-AGRI brochure on Water and agriculture](#) or on the webpage of the [EIP-AGRI Focus Group on Water and agriculture](#).

- ▶ The European Innovation Partnership on Water supports the development of innovative solutions for European and global water challenges. More info: www.eip-water.eu ●





EIP-AGRI Focus Groups

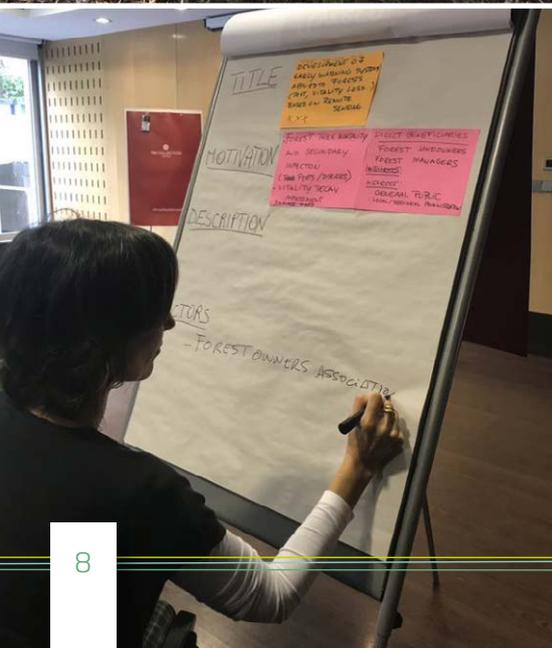
Innovation through expert eyes

Twenty experts, two meetings, one topic. These are the ingredients for EIP-AGRI Focus Groups to help catalyse innovation in European agriculture and forestry. The groups take stock of problems and opportunities for one specific agricultural theme, and suggest ideas for further research and potential Operational Groups.

Over 30 EIP-AGRI Focus Groups have already dealt with topics such as fertiliser efficiency, supply of forest biomass, water and agriculture, and renewable energy on the farm.

- ▶ All Focus Groups have their own page on the EIP-AGRI website. Find details and an overview of all results in the [EIP-AGRI Focus Group section](#).
- ▶ Two new Focus Groups are starting at the end of 2018:
 - ▶ Non-chemical weed management in arable cropping systems
 - ▶ Pests and diseases of the olive tree

Tip: All calls are announced on the [EIP-AGRI website](#). Sign up to the [EIP-AGRI newsletter](#) to stay updated.





Climate change: finding solutions for forest damage



Experts from the [EIP-AGRI Focus Group on forest practices and climate change](#) identified innovative practices and tools that can help mitigate the effects of climate change on European forests. To fully experience the influence that natural disasters caused by climate change can have, the group visited the Hotedršica forest area in Slovenia during its first meeting in June 2017. The area had been severely affected by an ice storm that had damaged more than 50% of all Slovenian forests.

Local forest services explained how they are dealing with the consequences of this storm, such as ice break and bark beetle attacks, and how they will face them in the future. Andrej Breznikar, forest manager at the Slovenian Forest Services, explains: "One way to contribute to more resilient forest ecosystems is by selecting species that are more adaptable to changing climate patterns. We can also use digital technologies that help manage the risks associated with extreme weather events, such as droughts, fires, or heavy storms."



Two Spanish Operational Groups were invited to share their experiences at the Focus Group's second meeting, held in Santiago de Compostela, Spain. They discussed innovative technologies to fight forest pathogens, forest management solutions for timber production, and digital tools to support rural areas, enriching the Focus Group discussions with insights from their innovative project experience. In turn, the work that was done in the Focus Group also produced inspiration and ideas for other potential Operational Groups and innovative projects.

- ▶ More information on the Operational Groups: [Abandonment of Forest and Rural Areas - Forest management for high quality timber production](#) (websites in Spanish)
- ▶ All results from the Focus Group on Forest practices and climate change are available on the [EIP-AGRI website](#) (final report will be published end of 2018). ●





#thematicnetworks



Thematic networks

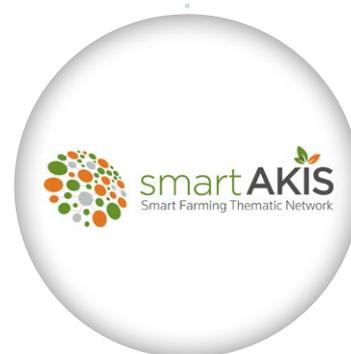
Harvesting knowledge ready for practice

Horizon 2020 thematic networks connect people and organisations from research and practice, to collect and share existing knowledge and best practices on a specific theme. The networks turn this information into easy-to-use material, such as practical recommendations, leaflets, or videos, that is useful for farmers, foresters and other professionals. Some thematic networks have just started, and are exploring opportunities for collaboration and sharing information. Others have already finished and are disseminating their final results.

Smart Farming technologies for European farmers

The Smart AKIS thematic network organised its final conference in June 2018. The objective of the Smart AKIS network was to spread information on available Smart Farming technologies to European farmers, researchers, advisers and others, encouraging them to collaborate and to exchange knowledge about Smart Farming. While the network ended in the summer of 2018, the [Smart Farming Platform](#) on the Smart AKIS website will remain open to anyone who wants to explore a wide range of available Smart Farming technologies or find opportunities for collaboration. Coordinator Spyros Fountas explains: "Many farmers feel motivated to take up innovative technologies when they see other farmers adopting them. At our workshops, we brought people together to identify options for collaboration, and ideas for innovative projects. A number of these will be prepared for submission to Operational Group calls. We have actively promoted the set-up of Operational Groups, because they are a perfect tool to overcome some of the social and economic barriers hindering the adoption of Smart Farming technologies."

- Find more information, [project recommendations](#), and results from the final conference on the Smart AKIS website: www.smart-akis.com





Newbie: network for new entrants

The Newbie network supports new entrants into farming, from successors to complete newcomers. Set up in January 2018, it stimulates the development and dissemination of new business models, including new entry models.

Coordinator Andries Visser: "Every country has its own specific challenges for new entrants, for instance access to land, capital or markets. Newbie wants to map these challenges and share innovative solutions and inspirational ideas, giving new entrants the tools to tackle these issues. We will be organising discussion circles where new entrants can meet advisers or other professionals from their thematic field. We will publish results and inspirational examples through practice abstracts, YouTube clips, and our website."

- ▶ **New entrants interested in joining the Newbie network can register on:**
www.newbie-academy.eu



Inspiration guide for innovation

What are the steps in an innovation process? And how can this process be improved? Thematic network AgriSpin has published a practical guide that offers inspiration and support to farmers, advisers, researchers, technology suppliers and others involved in innovative projects. It includes examples from 12 European countries, representing different stages of the innovation process.

- ▶ **Read the booklet on the AgriSpin website:** agrispin.eu/inspirational-booklet

- ▶ **Find an overview of all thematic networks that have been established so far** on the [EIP-AGRI website](#).
- ▶ **Get more details** on Horizon 2020 thematic networks in the [EIP-AGRI brochure and infographic](#).





Farmers at a MIKÄ DATA workshop, discussing how to calibrate yield sensors of combine harvesters, for more accurate analyses



European agriculture goes digital

Digital technologies for smarter farming

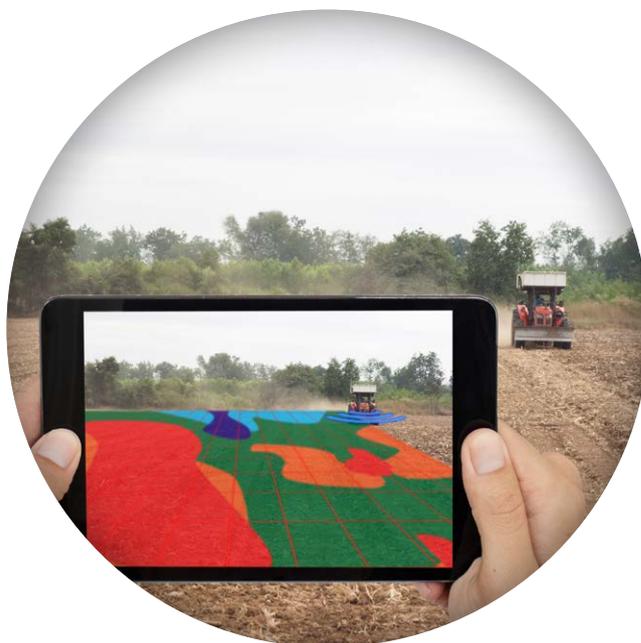
Many farmers already use digital technologies such as in-field sensors, smartphones, tablets, drones and satellites to monitor crops and livestock. The collected data allow farmers to improve crop yields and animal performance, reduce labour, and work more efficiently, all of which increase sustainability and profitability.



Intelligent data analysis for on-farm decision support

“With so much data available in farming, we saw the need for decision-making tools that give farmers easy access to information from their fields”, says Petri Linna, coordinator of MIKÄ DATA. MIKÄ DATA is a Finnish Operational Group that is building a data analysis service allowing farmers to check yields, and variations in soil types and nutrient levels. To do this, field data are collected through on-tractor sensors, drones, European Space Agency satellites and commercial satellites, and weather stations. The service also uses a harvest mapper that measures the exact crop yield.

The partnership consists of six farmers, a harvesting company, a drone company and a rural advisory service. “Farmers have been closely involved in developing this service”, Petri says. “They help us set goals that are in line with real farmer needs. So far, each of the workshops that we have organised with farmers has led to good discussions about data results. For instance, one farmer suspected soil differences, but only saw this confirmed by looking at field data that showed the exact line of soil type differences in his field.”



“Our next step will be to develop our service on the open-source platform ‘Oskari’, working with a combination of private data (‘myData’) and open data sections. This means farmers will be able to see and download their own field data, but also see open data from other fields. The platform will be useful for farmers but also for advisory organisations and contractors. In the near future, we will be exploring ways to collaborate more closely with similar projects across Europe.”

More details:

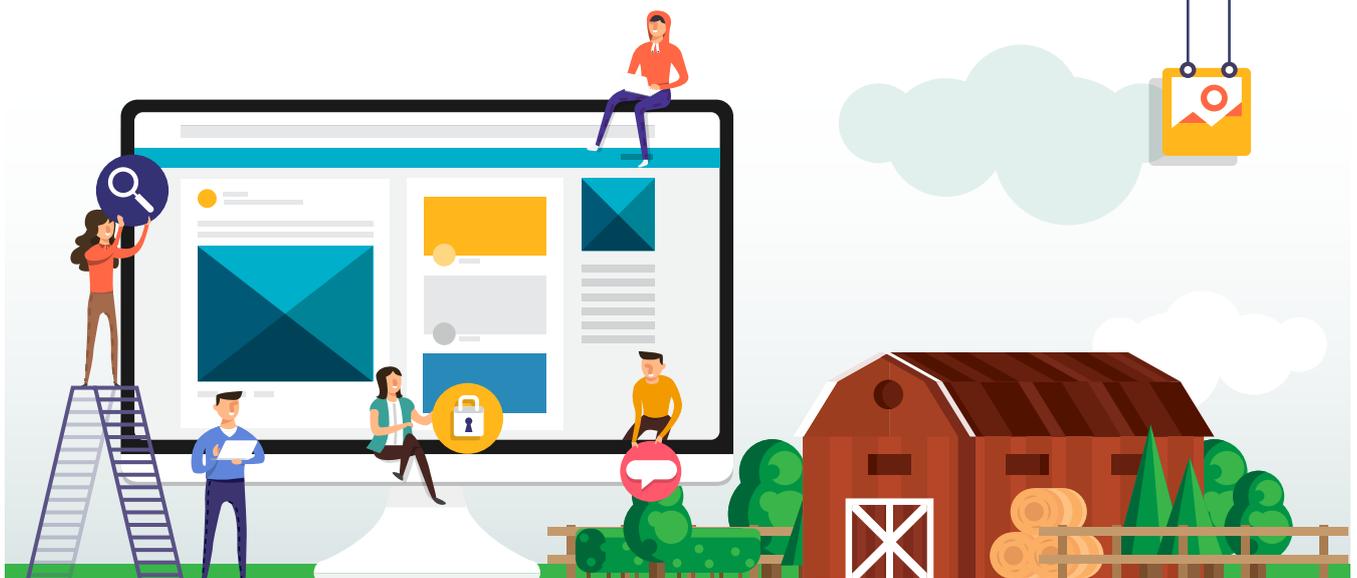
► <https://www.avoinsatakunta.fi/mikadataeng> or in the [EIP-AGRI database](#)





Developers at a hackathon ('HackTaFerme'), coming up with new farm applications

api-agro



Data platform for better connections

API-AGRO is a data and algorithm exchange platform. It helps all agricultural stakeholders to share their digital data in a secure and easy way, and connect with others in the agricultural value chain. The platform was set up by different public and private partners, including ACTA (network of agricultural technical institutes) and the French Chambers of Agriculture. It also offers the possibility to use data for the development of farm management software that may be useful to farmers, like calculating applications and decision support tools. For instance, one digital app that was developed through the API-AGRO platform gives farmers decision support in managing their cereal crops.

"We organise and secure the flow of information between different operators in the agricultural sector", says product manager Théo-Paul Haezebrouck. "We support everyone involved, with events like webinars, hackathons, and assistance for digital projects. If a data platform inspires confidence and is simple to use, it can stimulate data providers to make the most of their data, and to make use of innovative digital services with concrete benefits for agricultural producers and others in the sector."

► **More information:** <https://www.api-agro.fr> (in French) | **Twitter:** @API_AGRO

► **More digital opportunities for EU agriculture** in the [EIP-AGRI brochure digital \(r\)evolution](#) ●





Zooming in on research

GrassQ: ICT research for better grassland management

Knowing the quality and the amount of grass produced at any given time is important for farmers who want to manage the feed intake of their grazing cattle. The GrassQ project is developing a precision measurement technique for farmers to improve their farm grassland and grazing systems. "The goal of the project is to optimise the quantity, quality, the efficient utilisation, and ultimately also the profitability of a grass-based diet for dairy cows, while keeping labour requirements to a minimum", says Bernadette O'Brien from Agriculture and Food Development Authority Teagasc. "To achieve this, it is necessary to have an accurate 'real-time' measure of grass quantity and quality."

The GrassQ project is based on an automated grass measurement tool, called the Grasshopper, which has an ultrasonic sensor that measures grass quantity, and includes a built-in GPS. Remote sensing images of the measured pastures are also captured by satellites or unmanned aerial vehicles. The project aims to build a near infrared sensor onto the Grasshopper so that the quality of grass (dry matter and protein) can be estimated as well.

All data from both grass quantity and quality measurements, will be stored and processed on the GrassQ web platform. The resulting product will be high quality, real-time, geo-tagged information on grass quality and quantity, which the farmer can access through a user-friendly smartphone app or an online decision support system.

- ▶ This project is funded by the ICT-AGRI ERA-Net. More information on GrassQ can be found [on the ICT-AGRI website](#).
- ▶ The ICT-AGRI ERA-NET develops and strengthens European research in the field of precision farming, ICT and robotics in agriculture. ICT-AGRI supports the development and implementation of these new technologies for a competitive, sustainable and environmentally friendly agriculture. Find more inspirational ICT-AGRI research on <http://ict-agri.eu> ●

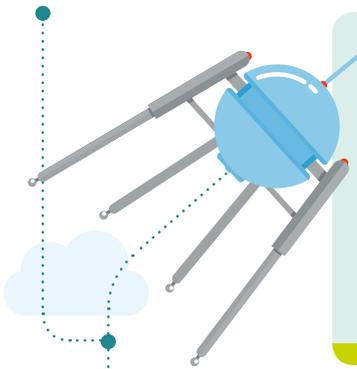




EU space programmes

Satellite support for future-proof farming

EU space programmes deliver services that can benefit millions of people. For agriculture and forestry, space data, technology and services can support precision farming, soil monitoring, forest management, food traceability, climate change mitigation, and much more. A number of innovative projects featured in this magazine (for instance MIKÄ DATA) already use satellite imagery for on-farm decision support.



Galileo: the European GPS

Galileo is the European Union's Global Satellite Navigation System (GNSS). With 18 satellites currently in orbit, Galileo is often called the "European GPS" because it provides precise positioning information that can be applied to support competitiveness and efficient management in farming and forestry.

► [Learn more about Galileo](#)

Copernicus: eyes on the earth

Copernicus is the European Union's Earth Observation Programme. It provides global data collected by satellites and other measurement systems. These data can be combined with sensors placed on earth, and can be used to support efficient decision making in farming and forestry, for instance for precision farming, crop and irrigation management, forest monitoring and more.

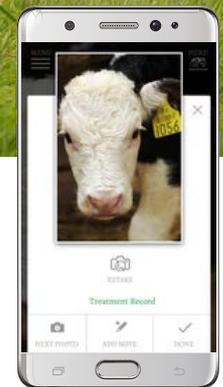
- More information on the [Copernicus programme website](#)
- Discover all services offered by Copernicus in this [Youtube clip](#)



The European Space Agency Business Applications programme offers funding opportunities for space-based services on the theme of 'Food and Agriculture'. It supports businesses who want to use satellite navigation and other space technologies to develop new commercial services. Partners can propose demonstration projects and feasibility studies.

- Find more details on the ESA Business Applications website, where you can also browse inspirational projects for crop protection, drought prediction, forest monitoring, pest control, food traceability and much more: <https://business.esa.int/>.





“Data use has to make sense for the entire value chain”

VirtualVet: farm data for animal health traceability

European farmers and foresters possess a wealth of agricultural knowledge. New tools, approaches and technologies can make it easier for them to share their information and expertise, learn from each other, and bring innovation to their farms and benefit from the results. Innovative data platforms, such as VirtualVet, offer services that support transparent and safe access to agricultural data, ensuring that the benefits of data sharing reach everyone in the value chain, especially farmers.

VirtualVet is a digital portal that farmers can use to record diseases and treatments administered in their herds in near real-time. This makes it easier to comply to EU food quality regulations. VirtualVet co-founder and managing director Sinéad Quealy believes that farm data are a valuable product, both for farmers and industries.

Sinéad, why was VirtualVet created?

Sinéad: “Well, having grown up on a farm and now being married to a beef and dairy farmer, I see the frustrations that exist around reporting on animal health and the use of antibiotics. Through my experience at the Waterford Institute of Technology working on software development projects, I’ve looked at how technology can offer solutions. Because yes, you can digitise data, but what are you going to do with it? Farm data, when digitised, should generate a clear value for the farmers who supply the information.

VirtualVet collects and visualises data on animal treatments, giving farmers a clear picture of the exact usage of medication. This makes it much easier for them to keep track of their animal health records. They can access their records themselves, for audits for instance, but they can also talk to their vet who can analyse the records for them, saving them time. Farmers can also have a look at data from an entire region. However, regional animal information is aggregated and anonymised. The service is free for farmers, and with their explicit permission, access to the farm data is sold to agrifood and animal health industries. The digitised data allow dairy food processors, for example, to get a better view of what is in the milk they are processing. And this visibility, in turn, helps to build trust in the supply chain.”



How hard is it to get farmers on board with this digital technology?

Sinéad: “Farmers seem to be very open to this service. We try to remove any possible barrier that would make it difficult for them to share their information with us. We have a mobile app - but they can also just ring us, leave a voicemail or send us a picture. Farmers are busy, so they appreciate this flexibility. We see that they are embracing the chance to control access to their data, and to contribute to a better traceability of medicines in agriculture. By seeing their data and by talking to their vet, farmers also become more aware of what works and what doesn’t, for instance regarding vaccinations.”

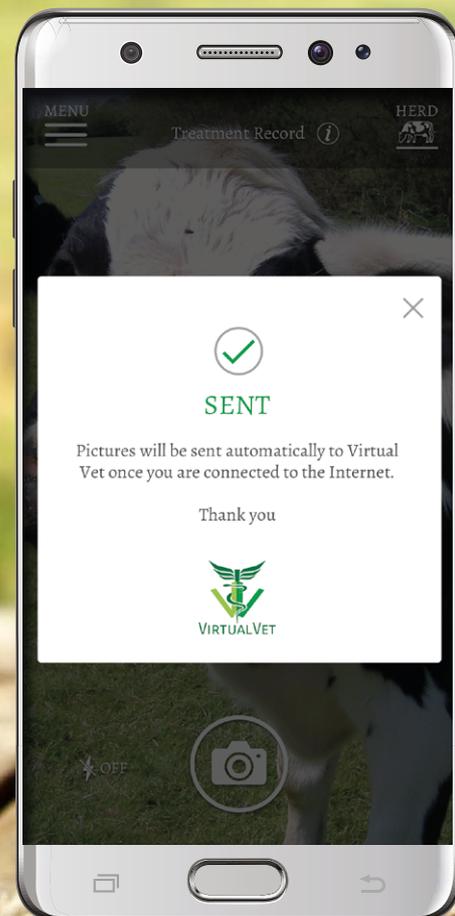
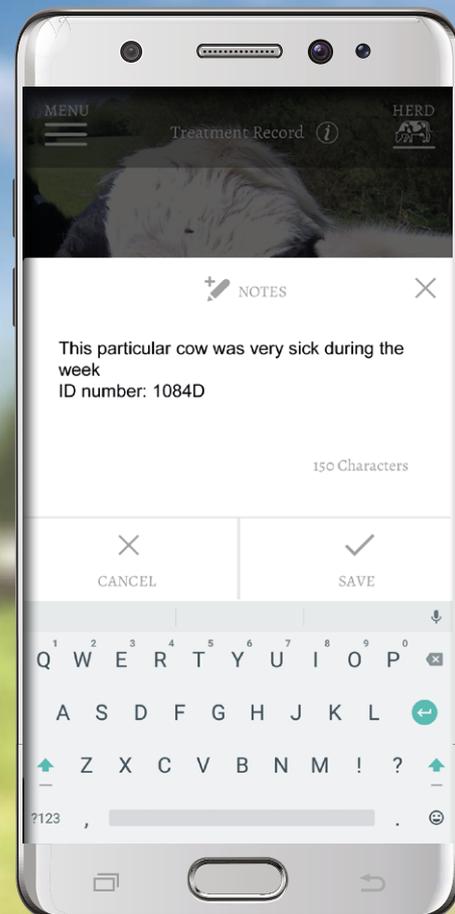
What’s next for VirtualVet?

Sinéad: “We want to continue getting the industries on board. Food safety and antimicrobial resistance are real societal challenges that we can help address. We can show industries the proof of farm data, which can let them reassure retailers and consumers that their food is produced to the highest standards possible. The use of farm data has to make sense for the entire value chain - that’s our focus.”

► **More information:** <http://www.virtualvet.eu>



- Find more information on new ways of sharing knowledge and learning in agriculture in the [EIP-AGRI brochure on Agricultural Knowledge and Innovation Systems \(AKIS\)](#).
- Digital technologies to improve knowledge flows and to empower farmers were the central topic in the [EIP-AGRI workshop ‘Enabling farmers for the digital age: the role of AKIS’](#).
- The [EIP-AGRI workshop ‘Data Sharing’](#) discussed models for fair and valuable data sharing in agriculture. ●





Horizon 2020 multi-actor projects

Joining forces to create solutions with more impact

Horizon 2020 multi-actor projects bring together partners from practice and research, to develop innovative solutions for concrete issues that European farmers and foresters are facing. By building on diverse expertise and knowledge, and by involving farmers from the start, multi-actor projects can bring results to the field with a bigger impact.

Agriculture meets Internet of Things technologies

The multi-actor project Internet of Food and Farm 2020 (IoF2020) stimulates the adoption of Internet of Things (IoT) technologies in European farming and food chains to strengthen competitiveness and sustainability.

“IoT technologies can be a game changer in agriculture”, says project coordinator George Beers (Wageningen University & Research). “Many technologies are already available, but there are some challenges. In agri-food, for instance, ‘things’ are often living creatures and technological devices need to function in harsh environments. Also, network connectivity can be a challenge in rural areas. Within IoF2020, we want to address user concerns about privacy and security issues, and identify appropriate interoperability solutions and business models that are also suitable for smaller companies.”

IoF2020 is testing IoT solutions for different thematic areas (fruit, vegetables, dairy, meat and arable farming) in different countries. These on-farm trials actively involve farmers, research centres, industries, innovative SMEs and technology providers. The trials help define the most suitable IoT solution for each case, and set the standards for the whole industry.

► **More information:** <https://www.iof2020.eu> - **Twitter:** @IoF2020





#cropdiversification



Clustering efforts for crop diversification

To increase impact and visibility, six multi-actor projects working on crop diversification have teamed up to create a 'crop diversification cluster'. The projects **Diverfarming**, **DiverIMPACTS**, **DIVERSify**, **LegValue**, **ReMIX** and **TRUE** hope that this will help them reach more farmers.

DiverIMPACTS coordinator Antoine Messéan: "Crop diversification is not easy to achieve. By linking projects that work on common objectives, we want to increase knowledge exchange and generate solutions that are more robust. We attend each other's events, hold joint meetings and field visits, and we use the common hashtag #cropdiversification when sharing news on social media. We want to create a network on crop diversification across projects, giving farmers, advisers and others access to our results and solutions even after the projects have ended."

- ▶ The cluster will be co-organising a European conference in September 2019. More information will be published on <https://cropdiversification2019.net/about.html>.

- ▶ Read more on multi-actor projects in the [EIP-AGRI brochure on Horizon 2020 multi-actor projects](#). An overview of all projects can be found on the [EIP-AGRI website](#).
- ▶ More on the latest Horizon 2020 calls (2019) in the dedicated EIP-AGRI brochure ●





Inspirational idea



Protein autonomy on the farm

Exploring protein crop production for quality feed

To feed their animals, most EU livestock farmers depend on imported raw materials that are rich in protein, such as soybean. These resources have an unstable market price and they may be genetically modified. This is why the Operational Group TERUnic is exploring ways to help farmers grow protein-rich crops on their own farms while remaining profitable.

Farmer Gérard Ménard is working with researchers and advisers within TERUnic: "Because my livestock has the Limousin label, I cannot use genetically modified feedstuff. I grow part of the protein crops I need for feed on the farm. For the other part, I buy in French rapeseed cake, which is guaranteed to be GMO-free."

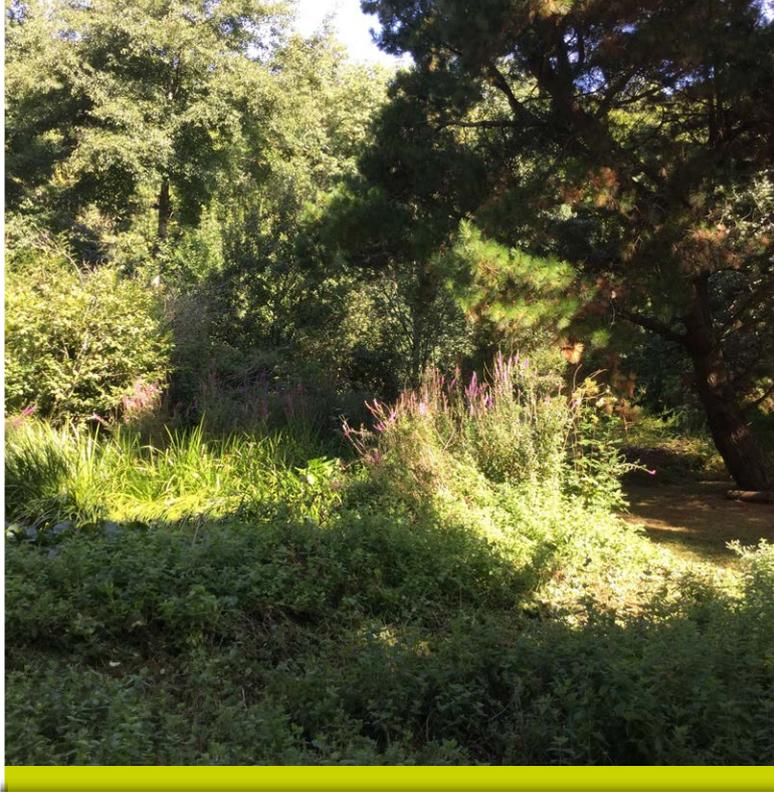
Protein self-sufficiency can be complex to obtain. Emmanuel Bechet, adviser at the regional Chamber of Agriculture of Pays de la Loire, explains: "It depends on the quality of the protein you're producing, and you have to calculate what is economically sustainable for the farm. Dedicating land surface for the production of protein crops means reducing the surface for other crops."

Ménard and Bechet have been using Devautop, a tool developed by the French Chamber of Agriculture. It shows which adjustments are needed for the farm to become more protein self-sufficient, and how this affects the workload and general business model of the farm. The results have been promising for Ménard: "This year, I am

buying only 6 percent of the protein I need to feed my cattle, compared to 50 percent in previous years. I grow pure leguminous crops, clover and alfalfa. After harvesting, we wrap the crops in plastic. This technique gives us the highest percentage of leaves, making the feedstuff rich in protein." Ménard uses Devautop to compare his results with those from other participating farms: "I'm happy to see that I'm doing well. More importantly, I see the conditions of my cattle improve, and this comes with an increase in income."

- ▶ TERUnic is one of four Operational Groups working under the framework of SOS Protein, exploring protein self-sufficiency in the West of France. More details [in the EIP-AGRI database](#) or [on the SOS Protein website](#).
- ▶ To learn more, read the [EIP-AGRI brochure on competitive protein crops](#) or take a look at the results from the [EIP-AGRI Focus Group on protein crops](#). ●





Inspirational idea



Forests for food

Ecosystems for biodiversity, soil health and food

Inspired by principles of agroforestry and the forest gardens that are found in many tropical countries, food forests make best use of the fruitful interaction between trees and crops. Food forests contain carefully designed layers of trees, shrubs and perennial crops that offer a variety of products such as nuts, herbs, fruit and other edibles. At the same time, they improve soil functions and biodiversity.

Food forests create natural ecosystems where the roots of trees help store carbon in the soil and improve nutrient circulation, and where the soil remains covered, which prevents water loss and erosion. With healthy soil as their foundation, food forests require less or no artificial fertilisation and help decrease CO₂ emissions, reducing the effects of climate change.

Martin Crawford from the Agroforestry Research Trust UK has devoted over 30 years to organic agriculture and horticulture, running his own organic market garden and tree nursery in South Devon, UK: "Our 2.1 acre forest garden contains about 550 different species, the majority being food plants. Some plants are there to attract bees and other insects for pollination and natural pest management."

While food forests are not an option for those looking for quick returns on their investment, they can offer a good yield with relatively little cultivation. Produce and seeds can be sold directly to consumers or restaurants. Martin emphasises that "food forests can produce food and

other crops, and in many cases they have an important social or educational function, and many ecological yields. There is a lot of interest in forest gardens at the moment. It is becoming clear that agroforestry is one of the best ways of making growing systems more diverse, more ecological, with more carbon storage, and capacity for mitigating climate change, which is why I expect the dialogue between farming and forestry to intensify over the next few years."

- ▶ More information: <https://www.agroforestry.co.uk/>
- ▶ Results from the [EIP-AGRI Focus Group on Agroforestry](#) ●





After our project was published on the EIP-AGRI website, we were contacted by a Spanish and a French group of farmers, both involved in innovative projects on organic farming. We will be meeting up with them next year. Through the website, we also interacted with IFOAM EU to see how we can support each other in disseminating results. For us, the EIP-AGRI website has been a good tool to connect and to emphasise the innovation aspect of our project."

- Gillian Westbrook, Irish Organic Association, coordinator Operational Group 'Maximising organic production systems (MOPS)' -

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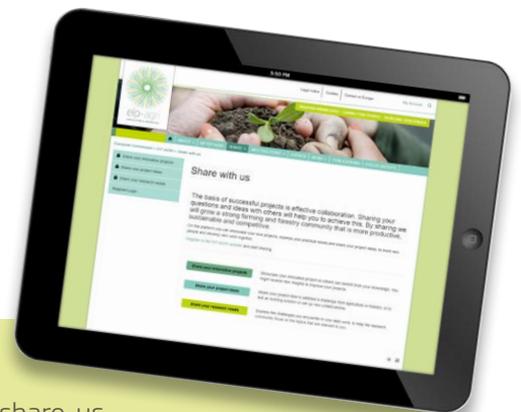
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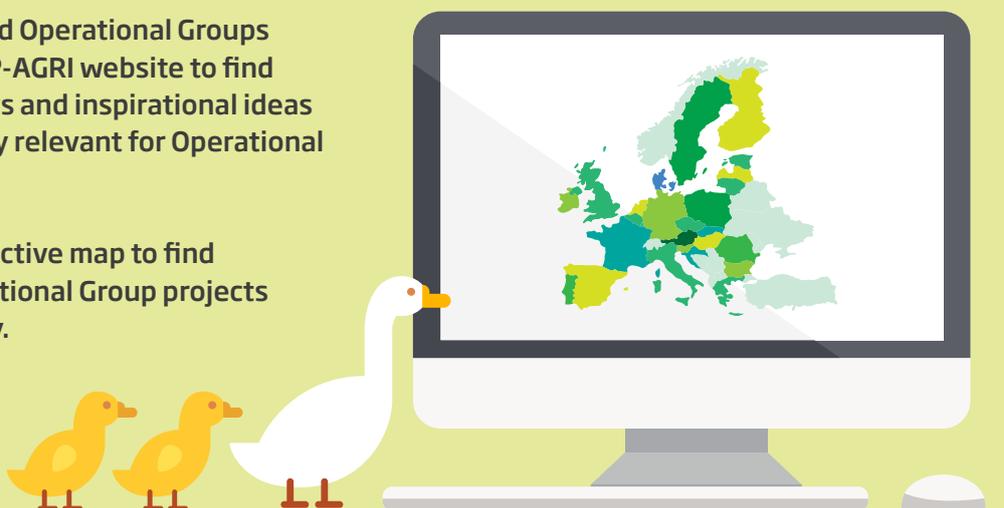
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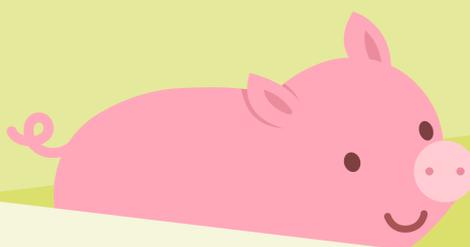
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