Research needs from practice
REPORT

Why collect research needs from practice?

Many research results are translated into practical applications very slowly, or not at all. On the other hand, professionals such as farmers and foresters may have the impression that research does not meet their needs. Defining "research needs from practice" can help solve this, by facilitating dialogue between researchers and those that can use research results in practice.

This report defines "research needs from practice" as problems which professionals from the farming and forestry sectors come across in their daily work, and for which research may provide solutions. These may include:

► New ways of working, which have been tested in practice and would benefit from further research.
► Inventions or innovative solutions discovered by farmers or foresters, which could be improved or adapted with further research.

The EIP-AGRI Service Point collects research needs from practice during workshops, seminars, Focus Group meetings and other networking activities, through activity reports of agricultural or forestry organisations and also via a dedicated **online form** on the EIP-AGRI website.

By making these research needs visible via the EIP-AGRI website, others with an interest in the same issue can review them and provide an answer to the problem. They can also decide to take up the question and try to solve it, for instance by setting up an innovative project with other partners.
These research needs will also become visible for national and regional policy makers and authorities, who may decide to take up specific topics in their calls for innovative projects. Of course this information is also feeding into the programming of European Research and Innovation activities.

Scope of this summary report

For this report, the final reports from EIP-AGRI Focus Groups, workshops and seminars were taken into account. These were supplemented by information that came in via the EIP-AGRI online form. This report takes into account the information that was available on 14 November 2018. It covers the period between 15 November 2017 – 14 November 2018 and comprises the following agricultural topics:

► Agroforestry: introducing woody vegetation into specialised crop and livestock systems (**final report**) (**factsheet**)
► Grazing for carbon (**final report**) (**factsheet**)
► New entrants into farming: lessons to foster innovation and entrepreneurship (**final report**) (**factsheet**)
► Sustainable mobilisation of forest biomass (**final report**) (**factsheet**)
► Reducing emissions from cattle farming (Submission via online form on behalf of the Focus Group. The final Focus Group report has already been incorporated in a former research needs report)
► Robust & resilient dairy production systems (**final report**) (**factsheet**)

Analysis of common themes

This report shows the **diversity of needs** for research from practice, but it also shows **similarities and connections** between the different agricultural sectors. Several issues appear to be important for different sectors and have been discussed in different Focus Groups:

RECURRING THEMES AND NEEDS	DISCUSSED BY
Different climate conditions / climate change Applicability of agroforestry tools to climate changes; Increase soil carbon content under different pedoclimatic conditions; Systems for carbon storage under different pedoclimatic conditions	• Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems • Focus Group on grazing for carbon • Submission via online form
GHG emissions Low-cost system for measuring GHG emissions; Practical implementation of indicators for quick and easy determination of emissions; Sensors to detect rumen environmental parameters; Reducing GHG emissions directly from the animal; Breeding for lower overall methane emissions per cow; Identifying trade-offs and synergies between C sequestration and other services (biodiversity, soil quality, GHG emissions etc.); Understanding the effect of grazing on GHG emissions; User-friendly ICT platform for smart optimisation of (wood supply) chains to support low GHG emissions	• Focus Group on reducing emissions from cattle farming • Focus Group on grazing for carbon • Focus Group on sustainable mobilisation of forest biomass
Managing nutrients Improving the use of available nutrients; Good utilisation of resources at farm level; Minimising nutrients escaping from the nutrient cycle; Biological-based fertilisers to improve nutrient supply; Effect of nutrient fertilisation on C:N:P:S ratio in plants	• Focus Group on agroforestry • Focus Group on robust & resilient dairy production systems • Focus Group on grazing for carbon • Submission via online form
Irrigation / water use Efficient use of water resource / increase water use efficiency, Optimisation of irrigation scheduling; Undertaking a holistic approach to analyse and develop a solution to the irrigation problem, which ensures every step, from water drilling to application; Finding a technology which proposes when, for how long and how much water should be applied on a specific field and crop; Irrigation system; Drainage effects; Water footprint	• Internet • Focus Group on agroforestry
Carbon loss and sequestration Carbon footprint; Measuring carbon stocks; Different grazing systems affecting soil carbon sequestration; Systems for carbon storage under different pedoclimatic conditions; Long-term carbon sequestration; Carbon losses and carbon gains in grazing systems	• Focus Group on agroforestry • Focus Group on grazing for carbon
Adaptability to local conditions Agroforestry tools applicable to local conditions; Agroforestry component combinations adapted to local conditions; Developing locally adapted animals; Region-specific appropriate species; Optimising ecosystem services for local conditions; A tool / decision support system that enables farmers to test the consequences of changes of farm management at local level; Robust monitoring system to monitor the relations between grazing practices and soil organic matter content (with common protocols and simultaneously locally adapted where needed)	• Focus Group on agroforestry • Focus Group on robust & resilient dairy production systems • Focus Group on grazing for carbon
Disease control / resistance Control of liver fluke; Control measures are being weakened due	• Focus Group on agroforestry • Submission via online form

to resistance development; Need to test areas to see if there is a high fluke snail level; Number of emerging infectious diseases on crops; Understanding the invasion process; Predictive epidemiological models; Test species concerning disease resistance; Adaptation potential to diseases, pests	
Breeding Breeding for lower overall methane emissions per cow; Breeding new varieties; New parameters for breeding indices; Ensuring progress for productivity as well and cost-reducing traits with balanced breeding goals	• Focus Group on reducing emissions from cattle farming • Focus Group on agroforestry • Focus Group on robust & resilient dairy production systems
Biodiversity (Long-term) monitoring of biodiversity; Links between carbon sequestration / organic matter and other ecosystem services like soil quality, and biodiversity; Robust indicators to monitor different ecosystem services; Promoting biodiversity conservation	• Focus Group on agroforestry • Focus Group on grazing for carbon • Focus Group on sustainable mobilisation of forest biomass • Submission via online form
Data standardisation / Data access / Databases Standards in data collection are needed; Compatibility; Standardisation; Validation of data; Reliable measurement techniques for farmers; Developing uniform interfaces between the systems; Performing inventory and "auditing" of existing EU (agroforestry) tools and resources; Integration of existing (agroforestry) databases; Accessibility of existing open databases; Improving accessibility of databases through compiling data for end-users	• Focus Group on agroforestry • Submission via online form
Decision support tools Decision support tool that suggests the spraying amounts that need to be applied; Decision support tool to calculate economic benefit; Supporting decision tools that need low Power WAN; Providing systems with more flexible and comprehensive decision-making tools; Decision support tools for the application of (plant protection) products; A tool / decision support system that enables farmers to test the consequences of changes of farm management at local level; Developing novel decision support tools; Novel generation of decision support tools for economically feasible (wood harvesting)	• Submission via online form • Focus Group on agroforestry • Focus Group on grazing for carbon • Focus Group on sustainable mobilisation of forest biomass • Submission via online form
Digital-based solutions / sensors / precision farming Sensors to detect rumen environmental parameters; Spraying with the use of drones; negative environmental impacts of Smart Farming Technologies; Crop sensors; Prescription task-maps/ as-applied map; Geo-referenced yield measurements/yield mapping; Smart phone as ultimate tool for running business; Remote sensing; Methods to measure all the performances of a system at the same time; GIS-based agroforestry design and management methods and tools; IT-tools on par with demand; Machines learning algorithms; User-friendly ICT platform for smart optimisation of (wood supply) chains; Smart (forest) harvesting machines; IT-based machine functions; Rating of existing smart farming technologies / neutral assessment	• Focus Group on reducing emissions from cattle farming • Focus Group on agroforestry • Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship • Submission via online form
Working together / peer learning Capacity building in collaborative solutions; Network of demonstration farms; Farmers listening to farmers; more effective knowledge exchange; Networks with demonstration farms; Development of online practical examples; Information,	• Focus Group on agroforestry • Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship • Focus Group on grazing for carbon

trainings and inspiration for the administrative and technical sector; Integration (of Agroforestry at) all educational levels; Development of a sound information basis (tools, databases, maps etc.); Database of videos for practitioners in all languages; What are the key skills or training required by (new entrants); How to foster cooperation (between new entrants)?; What platforms do (new entrants) use for communication / networking?; Collaboration between (new entrants and established farmers); Understanding, learning from and working together with farmers; Cooperation among (forest owners)	• Focus Group on sustainable mobilisation of forest biomass • Submission via online form
Farmers' motivation / behaviour Farmers' motivation to use smart farming technology; Farmers' hesitation to use smart farming technology; Smart farming technology – What are the hinders for proper and easy use?; Farmers' attitudes to fulfil social demands from consumers / dairy industry; Motivations of new entrants; How to promote more flexible and adaptive behaviour / practices in agriculture and rural development administration (regional / national)?; Understanding how farmers can be motivated to …. (via monetary incentives, information, etc.); Understanding farmers' behaviour, farmers' motivation and decision making in the adoption of (grazing) systems; What motivates a farmer to change a method or practice?	• Focus Group on robust & resilient dairy production systems • Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship • Focus Group on grazing for carbon • Submission via online form

The following overview clusters the identified research needs according to the priorities and cross-cutting issues that have been identified by the EC **strategy for agricultural research and innovation**.

Priorities and cross cutting issues	Research needs identified
Resource management	Biological-based fertilisers to improve nutrient supply; Efficient utilisation of water resource / increase water use efficiency; Optimisation of irrigation scheduling; Using precision spraying equipment; Drainage effects; Effect of fertiliser intensity; Improving the use of available nutrients; Good utilisation of resources at farm level; Carbon losses and carbon gains; Nutrient cycle; Soil organic content for different regions of Europe; Water footprint. [1]
Healthier plants and animals	Control measures against an increasing incidence of acute liver fluke needed; Control measures are being weakened due to resistance development; Number of emerging infectious diseases on crops; Understanding the invasion process; Predictive epidemiological models; Disease spread; Breed new varieties; Develop locally adapted animals; Genetic progress for resilience and efficiency; Region-specific appropriate species / cultivars of species / mixtures of species for grazing; Test species concerning disease resistance [2]
Integrated ecological approaches from farm to landscape levels	Looking for ancient wheats and promoting the biodiversity conservation; Testing suitable species for agroforestry systems; Assessment of Ecosystem Services; Indicators to assess Ecosystem Services; Landscape effect of agroforestry systems;

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[1] Submission via online form; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on robust & resilient dairy production systems; Focus Group on grazing for carbon
[2] Submission via online form; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on robust & resilient dairy production systems; Focus Group on grazing for carbon

	Linking agroforestry adaption potential to diseases, pests and water; Flood prevention through agroforestry at the landscape scale; Robust indicators to monitor different ecosystem services; Systems for carbon storage under different pedoclimatic conditions; Integrated forest management for wood, biodiversity and other ecosystem functions [3]
New openings for rural growth	Creating a system of companies that can guarantee income in disadvantaged areas; Sensibility / robustness of tools and resources to local conditions; Developing locally adapted animals; Benefits of local production models; Benefits of more locally based farm systems and farm jobs; Analysing the actions local authorities can offer (free market space, training, restaurants, land, etc.), How to promote more flexible and adaptive behaviour/practices in agriculture and rural development administration (regional/national)?; Identify region-specific appropriate species / cultivars of species / mixtures of species for grazing; Identifying best grazing management to optimise ecosystem services for local conditions; Testing consequences of changes of farm management at local level; Establishing robust monitoring system to monitor the relations between grazing practices and soil organic matter content (locally adopted); Regional (forest-based) value chains; Analysing long-established and well performing regional associations; (Forest-based) cross-regional value chains and production systems; Creating networks with demonstration farms at the local level. [4]
Enhancing the human and social capital in rural areas	Capacity building in collaborative solutions; Building a network of demonstration farms: users should have trainings or have easy access to documentations; Farmers listening to farmers; More effective knowledge exchange; Creating networks with demonstration farms at the local level; Developing online practical examples; Providing information, trainings and inspiration to the administrative and technical sector; Investigating how to foster cooperation between new entrants; What are the key skills or training required (by new entrants) and who can equip (new entrants) with them, and how? [5]
Systems approaches	Turning the smartphone into ultimate tool for running business: Grocery in your pocket (Potential areas: organic production legislation, planting in organic production, cultivation in organic production, etc.); Developing ways to assess performance of agroforestry systems (social, environment and economical) / Develop methods to measure all the performances of a system at the same time; Identifying best practices in different systems; Novel generation of decision support tools taking into account social, economic and environmental functions. [6]

[3] Submission via online form; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on grazing for carbon; Focus Group on sustainable mobilisation of forest biomass

[4] Submission via online form; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on robust & resilient dairy production systems; Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship; Focus Group on grazing for carbon; Focus Group on sustainable mobilisation of forest biomass

[5] Submission via online form; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship

[6] Submission via online form; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on robust & resilient dairy production systems; Focus Group on sustainable mobilisation of forest biomass

Societal engagement	What is the real opinion of consumers about dairy farming (What do they want?); What is the impact of consumers for the demand and supply? [7]
Information and Communication Technologies (ICT) as an enabler	Feeding models with real farm data; Sensors to detect rumen environmental parameters; Smart farming and small farms; Spraying drone / precision spraying equipment; Smart farming technologies on demonstration plants; Data flow and compatibility; Reliable prescription task-maps; Reliable input measurements for PA; Turn the smartphone into ultimate tool for running business; Applications using relatively low rates of data flow from field to farm to support decisions; To optimise the use of Smart farming technology, users should have trainings; Evaluating the impact of the smart farming technology use / hinders of proper and easy use; Rating of the existing smart farming technologies / a neutral assessment; Developing uniform interfaces between the systems; Systems with more flexible and comprehensive decision-making tools; Remote sensing; Performing inventory and "auditing" of existing EU (agroforestry) tools and resources; Tools to be used by farmers; Integrating existing (agroforestry) databases / Organising accessibility of existing open databases/ open-platforms / user-friendly ICT platforms; IT-tools should be on par with demand; Decision support system (e. g. enabling farmers to test the consequences of changes of farm management at local level); Machines learning algorithms; Analysing the potential of digitalisation and e-commerce [8]
Socio/economic research	Doing on-farm applied research of labour inputs; Incentives for (tree care) over generations; Understanding the impact of financing and taxation on on-farm decisions (large variability across Europe); understanding the role of insurances; Developing policy instruments to encourage and support farmers in the delivery of ecosystem services (ES); Benefit/cost balance; performing surveys about social demands from dairy industry and farmer attitudes to fulfil these demands; Finding new business models for overcoming barriers concerning access to land, capital, markets, labour; Investigating indicators of success and failure (of new entrants); Benefits of local production models; Analysing the impact of new entrants to region, employment, innovation, succession process, economy, etc.; Cooperation / business models between new entrants; Understanding how farmers can be motivated to manage ….. (via monetary incentives, information, etc.); Analysing how long-established and well performing associations do operate?; Impact of globalisation. [9]

Browse the research needs online:
https://ec.europa.eu/eip/agriculture/en/find-connect/needs-for-research

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[7] Focus Group on robust & resilient dairy production systems; Focus Group on sustainable mobilisation of forest biomass

[8] Submission via online form; Focus Group on reducing emissions from cattle farming; Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship; Focus Group on grazing for carbon; Focus Group on sustainable mobilisation of forest biomass

[9] Focus Group on agroforestry: introducing woody vegetation into specialised crop and livestock systems; Focus Group on robust & resilient dairy production systems; Focus Group on new entrants into farming: lessons to foster innovation and entrepreneurship; Focus Group grazing for carbon; Focus Group on sustainable mobilisation of forest biomass

Finding solutions for research needs from practice

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Identify your research need from practice

Register to the EIP-AGRI homepage and fill in the form
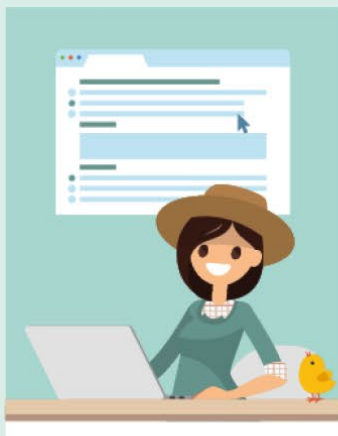
Discuss your research needs from practice during EIP-AGRI seminars or workshops ...

... or with other experts in an EIP-AGRI Focus Group

FOCUS GROUP

Perhaps somebody else has already found a solution?

Perhaps a researcher will take it up?

SOLUTION FOUND

Join the EIP-AGRI Network at www.eip-agri.eu

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