# Results of EIP Focus group on Mainstreaming Precision Farming

EFITA – ERANET ICT Agri workshop in Poznan

1st July 2015, Kees Lokhorst *et al.* 









### 'Used definition'

Precision Farming refers to a management concept focusing on (near-real time) observation, measurement and responses to inter- and intra-variability in crops, fields and animals.







### Question?

- How to organise the data capture and processing to mainstream the application of precision farming for an optimisation of inputs and yield?
- Try to identify the main reasons behind the current lack of adoption, and identifying the key barriers to the implementation of Precision Farming on European farms.



### Members of the EIP Focusgroup

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## **Expected tasks**

- Identifying and assessing the different systems and use of data handling
- Looking at where compatibility issues need to be resolved
- Collecting existing/potential solutions to process and integrate large data volumes from sensors into user-friendly FMIS
- Collecting existing/potential solutions to integrating precision farming systems into small and medium-sized holdings.
- **Listing** fail factors that limit the use of techniques/systems by farmers and how to address these factors as well as **explore** the role of innovation and knowledge transfer in addressing these fail factors.



## First round: identify key topics

### >25 votes: themes of high importance

- 1. How to reach farmers?
- 2. Cost/benefit for farmer/business of PF (including business models)
- 3. Compatibility of PF data infrastructure. Processing large volumes of date. Data Friendly FMIS.
- 4. Ownership of the data

### 16-25 votes: lower importance

- 5. Strategy for PF systems in small and medium sized holdings
- 6. Support for advisors
- 7. Data storage and sharing and technical solutions
- 8. Research needs





### < 16 votes: lowest importance and more general

- 9. Innovative incentives
- 10. Dissemination
- 11. Training for farmers
- 12. Traceability
- 13. Training of small and medium sized farm holdings
- 14. Farmers' attitude
- 15. Public acceptance: transparency
- 16. Retail
- 17. Role of media
- 18. PR
- 19. Complexity
- 20. Infrastructure
- 21. Other topics: lack of legal framework

## From mini-papers to EIP-report

- Challenge in a one-liner
- Innovations: what areas need new solutions? Perhaps there systems outside the farm world that could be transferred/adapted?
- What research/innovation is needed to work towards a solution?
- Knowledge: is there new knowledge necessary to provide the innovation
- Operational groups: suggestions on topics for OGs
- Dissemination: what can be done to spread these solutions?





Draft Mini paper within the 'Research Needs' within the role of innovation and knowledge transfer

Kees Lokhorst, Kristof Mertens, Spyros Fountas, Emilio Gil

#### Challenge

The challenge for Smart Farming research is to fit in the philosophy, products (hardware, (embedded)software and ICI intrastructure) and services into real daily management support systems for farmers and other chain partners. Be aware that there is a need for farm specific solutions.

#### Innovations

With regard to the topic of research there are several innovations needed. In general the idea is that most of research in this field still concentrates on the development and testing of sensing and sensor technology. Also the key applications in precision agriculture have been on using these sensors and the use of QPS locations for tractor and implement guidance systems.

The challenges for the coming years on innovation are on:

- How can we change the research attitude from talking about to talking with the farmers. Research and product development definitely needs active interaction with farmers and other users of data and information that will be generated in smart farming.
   Projects need to have the character of co-creation, in a public private partnerships.
- Innovation will also be stimulated if we are not tosed to the agricultural domain. Even within the agricultural domain we have problems of exchanging ideas and good innovations between sectors. In the field of ICT the big steps are expected from outside the agricultural sector. In ennovative challenges then on the aspect how to make people aware of these developments and how to stimulate agricultural specialists to make these developments available for the agrigand food domain. So the challenge is to bring together the people that are aware of the agrig and food brailenges (some may say problems) and people that can bring in the ICI of evelopments. Iopether they can work on added value products and services. Together we have the challenge of inter sectoral and multilisticiliation vocaceration. This individed new 1 Livino Labs'.
- Although there has been done already quite a lot of research, there is always need for more. In almost all phases of product and service development there is a need for research. In time it will differ between fundamental, experimental, applied and validation based research. In general the feeling is that the more research has been done the



EIP-AGRI Focus Group
Precision Farming

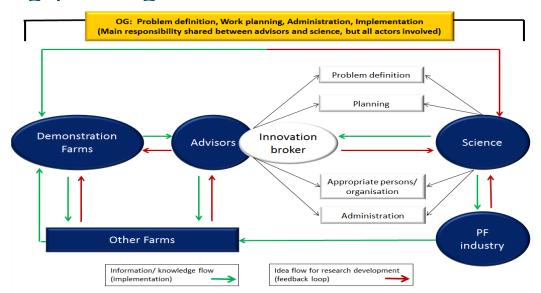
## 1 Why would farmers take up precision farming?

- How to overcome investment risk and perceived complexity, and to discover the specific benefits for the individual farmer.
- C: Farmers should be actively involved in development of PF tools to ensure clear benefits at farm level.
   Training in Precision Farming technologies for farmers is essential. Farmers themselves must drive the demonstration of appropriate technology.
- R: a collaborative technology transfer initiative is required. This would involve researchers, advisers, technology providers, and should have a clear focus on farmers' needs.



## 2 Support for advisers

- advisers should understand PF so they can provide appropriate advice to farmers.
- C: development of specific data analysis tools with special emphasis on cost-benefits. Farm advisers will need to connect all members of the collaborative knowledge transfer initiative.
- R: Advisers need appropriate analytical support tools and focused training packages.

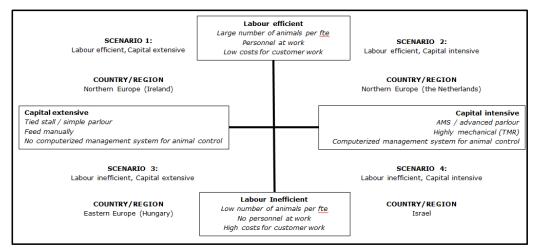




## 3 Cost-benefit analysis of PF

- The benefit of current PF to the farmer is not always clear. Some farmers **fear** that PF will bring additional costs and complexities, and new sources of technical problems.
- C: Stakeholders often lack the tools to calculate potential profits and benefits. Unclear business models of PF and associated costs and benefits. Take into account geographic regions and socio-economic variability across Europe.
- R: Validated PF decision-support models and analysis tools also for farm advisers and farmer trainings.

Kamphuis et al., EU-PLF





## 4 Strategy for PF in small and medium-sized farms

- PF services could be offered to SME farms either by larger neighbouring farmers at lower cost or by companies as a service, or via other business models.
- C: Regional training and awareness for successfully reaching advisers and small and medium-sized farms.
- R: Need for PF tools that are designed for small and medium-sized farms, with the requirements of being easy to use, affordable and robust. Learning by doing. Customised advisory services need to be developed.



### 5 Technical solutions

- how to provide the PF community with technical solutions that can readily apply agricultural knowledge in closed-loop control systems. Solutions need to be smarter and integrated into the farm management system to support farmers in their decision-making.
- C: introduction and further development of
  - i) electric drives to facilitate precise electronic control of equipment and implements;
  - ii) Internet of Things to facilitate machine and processor communication;
  - iii) nanotechnology and biosensors;
  - iv) drones and autonomous platforms.



### 5 Technical solutions

### R:

- generate 'as-applied' maps that can be combined with other data for making further management decisions.
- Farmers and cooperatives need to play a major role in innovation and in research of technical solutions.
- Solutions need to become smarter and integrated into farm management systems
- The added value of these solutions should be tested, validated and demonstrated in practice.



## 6 Data management and compatibility

- As modern farms are increasingly loaded with all kind of sensors, data management, data storage, data sharing and interconnectivity strategies are urgently needed.
- C: Adoption of shared data schemes exist but are not widely spread. Compatibility issues in PF are limiting the development of technology. Poor compliance with, standards for software development and data formats, limited data infrastructures on farms that are not designed for data sharing, and extensive brand protection by large companies.
- R: New business models for data management are needed; sharing and open-data sources should be developed to bring PF to the next level.



## 7 Research to boost innovation and knowledge transfer in PF

- Agriculture is challenged to produce more while conserving the environment and staying aligned with societal and regulatory developments. Innovation and 'regional' diversification are key to success. Research in itself is needed as a driving force of innovation.
- C: More applied and business driven research, involving farmers, advisers and supply chain partners, is needed. Relevant research should adopt a systems approach covering social, economic, environmental and technical aspects.
- R: Create 'Precision Farming living labs' and collaborative networks.



## Take home message

- data compatibility and handling are important issues
- utility of many PF applications has not been fully demonstrated
- missing cost/benefit analysis
- lack of user-relevant research at both basic and applied levels
- technology development will stimulate interactive innovation
- lack of resources that are necessary for business-driven innovation to enable a market uptake.
- PF needs collaboration of stakeholders in order to achieve widespread EU farm adoption.
- Operational Groups can stimulate and help spread the innovations



# Thank you for your attention

### Info on website:

https://ec.europa.eu/ eip/agriculture/en/con tent/mainstreamingprecision-farming

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