# Testing precision fertilisation techniques for grassland management

Precision agriculture project improves uptake of sustainable farming techniques on Dutch dairy farms

#### **EAFRD-funded projects**

Location: Drachten, The Netherlands Programming period: 2014-2020 Priority: P2 - Competitiveness Focus Area: Farm's performance, restructuring & modernisation Measures: M16 - Cooperation Funding: RDP support 528 998 (EUR) EAFRD 264 499 (EUR) National/Regional 264 499 (EUR) Timeframe: 2019 to 2022 Project promoter: DLV Advies

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Summary

New and innovative techniques are nowadays available to help farmers gather and make good use of data, but each new technique requires testing and calibrating before it can be considered ready to be launched on the market. Also, farmers need to see the new techniques applied in practice before adopting them on their own farms. This CAP-funded cooperation project tested and demonstrated new precision agriculture techniques for chemical fertilisers and manure use for grassland management.



Visualised growth of dry matter by mapping - © S. Waltje

## **Project results**

- > Due to this project, 125 dairy farmers are now involved in study groups on precision agriculture.
- CAP support enabled the robust testing and calibrating of techniques that weren not otherwise ready for the market.
- More stakeholders were reached by this project via publications and demonstration days.

# **Key lessons and recommendations**

- Demonstration events and well targeted communication campaigns are effective tools for facilitating the transformation of EU food systems.
- Sequential projects stimulate and complement each other: A preceding subsidised project that focused on chemical fertilisers was the stimulus to start this project with a focus on manure. One project can lead to another as more farmers become more aware of the opportunities to develop a more sustainable way of farming.

### Context

Climate change and stricter regulations mean that farmers need to make better use of manure and reduce their greenhouse gas emissions. In the north of the Netherlands, an additional challenge is that water quality and quantity need to be preserved. A solution to these challenges is precision agriculture. In precision agriculture information and data are key to the more effective use of the soil and for improving water quality. New and innovative techniques are nowadays available to help farmers gather and make good use of data.

To adopt these new techniques, farmers first need to see the benefits.

A previous initiative was implemented in the project area which demonstrated precision agriculture to arable farmers. That project gave them hands-on management tools to improve water quality and to make better use of manure. A new project was necessary to show the benefits of precision agriculture to dairy farmers, including how to grow animal feed at their farms and how to use the manure produced by their livestock.

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# **Objectives**

The aim of this project was to demonstrate the benefits of precision agriculture for dairy farmers, test new techniques and raise awareness about effective manure use.

#### The objectives of the pilot farms testing phase were:

- To make more farmers aware of the importance of healthy soil and of precision management by networking and sharing related project information via demonstration events and media.
- To supervise nine farmers in applying modern and innovative techniques.
- > To reduce the use of chemical fertilisers on these farms by 10%.
- > To use chemical fertilisers and manure more efficiently (to reduce nitrogen run-off).
- > To increase organic matter in the soil by 1% (to increase water buffer abilities).
- > To improve water quality by closing the nutrient cycle at participant dairy farms (measured and calculated).

# **Activities**

- In the first year of the project, different techniques were tested including Veriscan, which measures and maps the amount of organic dry matter in the soil; a drone, which was used to measure and map growth of dry matter in grasslands; the Near-infrared (NIR) system, which measures real time amounts of minerals in manure that is spread on grasslands; and GPS, to assess spreaders for chemical fertilisers.
- > The NIR system had to be calibrated since the fault margin was too wide to make good use of it. To calibrate and supplement data mapping, students worked together with labs to analyse soils, grass and manure.
- The innovative techniques were tested at nine farms in the north of the Netherlands in cooperation with four contractors and a drone company.
- > At each farm, a paddock of 10 hectares was mapped and analysed.
- > Different management approaches to make use of the data were tried and analysed.

# **Main results**

- > As a result of this project, 125 dairy farmers are now involved in study groups on precision agriculture. Reports on the nine different farms show very positive results.
- More stakeholders were reached by this project via publications and practice days. The awareness raised within the dairy farmer sector regarding precision farming is the most significant benefit of this project.
- This project made it possible to investigate alternatives that had not been tested or introduced. CAP support enabled the robust testing and calibrating of techniques that were not otherwise ready for the market or had not been adopted. For example, the calibrated NIR system is now reasonably reliable.
- Advisors analysed different techniques to find out the effects of precision management. For example, the question of whether farmers should stimulate low productive soils with more manure or whether they should compensate high yielding soils with more manure was put to the test. This research provided a lot of hands-on information and management options.

# **Key lessons and recommendations**

- Demonstration events and well targeted communication campaigns are effective tools for facilitating the transformation of EU food systems.
- CAP support allowed the project consortium to test different and new techniques and to optimise processes in search of the most beneficial combination of techniques.
- Sequential projects stimulate and complement each other: A preceding subsidised project that focused on chemical fertilisers was the stimulus to start this project with a focus on manure. One project leads to another as farmers become aware of the opportunities to develop a more sustainable way of farming.

#### **Additional information:**

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