

AgriNav

Helping Small Farmers Benefit From
Variable-rate Rertilizing Technology

Consortium



VULTUS



ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
AGRICULTURAL UNIVERSITY OF ATHENS

Sector

AGRICULTURE

Duration

9

MONTHS

Challenge

With the world population predicted to increase to 9 billion, food production will also need to increase by up to 70%. Currently, to obtain high yields, farmers often overuse fertilizer which causes severe problems in the health of rivers with the overgrowth of algae. The project involves the development of a software for application of variable quantities of fertilizer to a crop according to need. By reducing the volume of fertilizer used, both the farmer and the environment benefit. Using Vultus software and AgriNav guidance, ATVs with fertilizer spreaders are enabled to move precisely along each crop row.

DIATOMIC Support

DIATOMIC has greatly supported AgriNav with training and coaching. As a result of the training, the commercial applications have been mapped out and potential customers have been identified. Prior to entering the competition, the technical challenge was creating a 'miniaturized' device that would improve yields for farmers. The conversations with potential clients have shown that there is a growing demand for precision agriculture technology in order to maintain the long-term viability of a farm.

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Timeline

During the design phase, the team carried out market research to understand customer requirements. To define the requirements, the team liaised with local farmers and created a top-level list of requirements that were then grouped by epic and inputted into Jira. In the next phase, the guidance system was developed, combining GNSS, laser-following and image processing to obtain similar accuracy to RTK systems. By using 3 sensors, the guidance system has better accuracy compared to a standard GNSS. Finally, a route to market was tested and the viable market was fruit farms. The initial version of the product will be sold directly, while it is anticipated that in the future the product will be sold through integrators.

Stakeholders

- Fruit farm owner
- Local farmer
- Farm 491 - Agritech
- Farmstall owners at the Oxted and Edenbridge show
- Fruit farm customers

End Users

The experiment involved input from the following stakeholders:

- Local fruit farm offering a 'pick your own' service to local customers.
- A local start-up farmer in Sussex offering fresh fruit and vegetables to the market.
- A dairy farm

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Key Results

The consortium has worked to create a system that will allow a consumer to upload the coordinates of each field or farm, have its size analysed, and then download the data from Vultus. Once the data has been downloaded, the file is transformed into an 'Agrinav' file-format and can be installed onto the unit.

The project has highlighted some general learnings:

- It is difficult to set up WPS on a Raspberry Pi.
- Once installed, an effective method for validating a file is through the licence engine, and this takes place each time the unit is updated with the new firmware.
- The customers we have highlighted generally operate using android mobile phones and therefore require access to a mobile-friendly solution.
- There is ample opportunity to further improve tractor sized fertilizer spreaders.

It is possible to alter a small fertiliser spreader and adjust it to have 5 settings. After 5 settings, there are diminishing returns on the spread of fertiliser. The fertiliser spreader can be pulled by a quad bike or an RTV.

Impact

Variable-rate fertilizer spreading has the potential to improve the efficiency of small farms in developing countries. The feedback given by many farmers is that large tractors and machinery are unaffordable, but that small fertilizer spreaders do not have variable rate capabilities. The types of farms that benefit from variable rate fertilizer spreading grow vegetables and fruits.

In research carried out by the Agriculture University of Athens, lettuces were found to be adversely affected by too much fertilizer, and therefore benefit from the variable-rate fertilization.

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Testimonials

“ Precision agriculture is critical to the future of my business, and important in protecting my margins. The future vision of the product is exciting, and it will be interesting to see the proof of concept technology operational.

— Paul R. Sussex Farmer

“ I can see that this will potentially save a lot of money for my business and operational costs. I think that the facility to access areas, not typically suitable for tractors is important. I am keen to see the final product.

— Julia C. French Farmer

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