RURAL 2020

Innovation groups in rural Finland

We are beginning to see the results of EIP funding. The first groups are off to a good start and the rest of the funds will be allocated soon

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Digital service collects field data to help the farmer

Precision agriculture means that the farmer targets production inputs and measures on the basis of data obtained from the lands. In Finland technologies for precision farming have been developed for decades, but it is still not very common. Now this is being addressed by a joint innovation project of researchers, advisers, companies and farmers. The aim is to create a digital service that integrates data from various sources for use by farmers.

– At the moment the data on agricultural land areas lands is scattered and does not serve the farming operations in the best possible way, says Petri Linna, Project Manager from the Tampere University of Technology.

– Through better data management we could improve the efficiency of farming in quite a different way than through actions such as buying bigger machines.

A good example of more efficient data collection is the yield scanner that enables the collection of precise yield data from fields and helps to optimise fertilisation and other farming operations.

– Besides this, the use of drones on farms is just getting started, Linna says.

More information: Petri Linna, Project Manager, Tampere University of Technology

Minihelicopter spots weeds from aerial images

Wild oats cause economic losses to farmers. Cereal contaminated by wild oats is not fit to be used as seed and its market value is also lower. It takes a lot of time for farmers to walk back and forth on the fields to spot the stems of wild oats, taller than the other crops. And all this during the busiest season in July-August.

A group of plant scientists from the University of Turku combined their competence with data processing science and a drone service company. Farmers fighting against wild oats got involved as well. The innovation group thus created develops the identification of plants using images taken by the drones.

The images also enable to locate the wild oats on the fields, which means that there is no need to walk on the fields at random. The images provide various kinds of important information on the condition of the land, thus helping to plan measures such as fertilisation, irrigation or ditching and the use of pesticides. They also give more precise data on the presence of weeds, which means that the sprayings can be targeted to where they are needed. This helps to reduce the use of pesticides. The group is testing whether weeds can be identified already in the shooting phase.

According to Esa Tyystjärvi who leads the project, automatic devices that move about in the fields and are capable of identifying and eradicating weeds are still in the early stages of development. – The key benefit of drones is speed, and the fact that you don’t have to walk or drive on the fields, which always leaves tracks. The work of the innovation group offers new business opportunities for the drone companies as well.

More information: Esa Tyystjärvi, University of Turku, firstname.lastname@utu.fi

High-quality cereal with less energy

In Vähäkyrö in western Finland grain drying has been rethought altogether. A farming consortium and a company that supplies grain dryers joined their forces and received innovation funding for their project. – We are building a modern, automated cereal drier with a new kind of device for moisture measurement. As a result we have more homogenous quality, with less energy and farmer's time consumed in the drying process, Sippola says.

The measuring techniques so far used in grain drying have been inaccurate, which is why the grains are usually dried for a longer time than necessary just in case. The farmer cannot fully rely on the automated dryer to changes the dried grains into another batch. External factors such as air humidity may have a significant impact on the outcome. Automation is no use if the farmer has to go and check how things are on the spot.

The more precise measuring devices to be built by means of the innovation funding stores the data into the cloud service and the farmer can monitor the situation using his or her home computer. The energy-smartness is further enhanced by the farm's own chipping plant which provides the operating power for the dryer.

More information: mtysippola@netikka.fi

New business from the recycled fertilisers of the future

When producing biogas from animal manure, raw material suited to be used as recycled fertiliser is created in the same process. The raw material may not, however, be at its best to be used by the farmer without further processing.

Researchers, farmers and biogas producers have joined forces in an innovation project aimed to produce even better recycled fertilisers for farming. The three-year project, coordinated by the Finnish Environment Institute, is based on the farmers' needs. Interviews and surveys are conducted where farmers get to tell about their wishes concerning recycled fertilisers.

Farmers will test the effects on recycled fertilisers on the yields of cereals, grasses and greenhouse cucumber and compare these with the yields achieved with other fertilisers. Better guidelines will be prepared for the use of recycled fertilisers and technologies will be sought to maximise efficiency in their production.

Increasing the use of recycled fertilisers requires that they improve the profitability of farms. At its best the manufacture of recycled fertilisers may mean significant new business opportunities.

More information: Heidi Rintamäki, Researcher, Finnish Environment Institute, heidi.rintamaki@ymparisto.fi

Innovations to produce superfoods

Finnish oats find demand worldwide, and it is constantly studied to develop new products for the market. The challenge in producing this super raw material is that the four tonnes of oats with hulls provide just 2.5 tonnes of raw material fit for food use. The remaining 1.5 tonnes is a side fraction resulting from sorting and hulling. In addition, harvesting leaves about 4 tonnes of straw in the field. So far the side fraction of oats production has not been efficiently used. Now the aim is to develop the processing of the side fraction and straw to improve the profitability of oats production and the quality of oats. In the project carried out by means if the innovation funding the Natural Resources Institute Finland, together with researchers, advisers, cereal and technology companies and farmers, investigates how the plant mass created in oats production could produce raw materials to be used for various purposes, including as soil improvers and feed.

If the methods tested in the project meet the expectations, this is a significant step forward in the production of high-quality oats and for creating new innovative oats products. In the years to come the results of the project should be reflected in the everyday operations of oats producers: there is equipment available to process the side fraction to be utilised for other purposes, which improves the profitability of oats production. – Events for farmers will be organised all through the project to share the most recent information on the results, says the leader of the project Veli Hietaniemi from the Natural Resources Institute Finland.

More information: Veli Hietaniemi, Researcher, Natural Resources Institute Finland, veli.hietaniemi@luke.fi