



Project Guides European Farmers From Space

Farmers traditionally keep a close eye on their fields, but a new ESA-led project seeks to build on their vigilance with monitoring from space.

The TalkingFields initiative is now showing how to combine satellite observation with satellite navigation to benefit European farmers.

Sustainable food production and food security are critical challenges. TalkingFields will help by using precision farming methods to produce crops more efficiently. For instance, by optimizing farmers' use of fertilizer and giving early warning of plant disease risks, both costs and environmental impacts can be reduced.

"There are existing services variously employing Earth observation data, satellite navigation, farm management software and crop growth models, but TalkingFields is the first to combine them all," said ESA's Tony Sephton.

"We're setting up an end-to-end service that is simple to use and sufficiently cost-effective to be self-sustaining."

How does it work? The farmer requests the service for an area defined using satnav. Satellites gather information on the land's potential – observations over several years can reveal variations in crop growth through soil changes – as well as current crop status.

These results are combined with information from field sensors such as weather conditions and soil moisture. The farmer adds in his own knowledge, and in return receives detailed satnav instructions on where and how much fertilizer to spray, for example.

A variety of satellites can be employed, although priority will be given to free data sources such as Landsat and ESA's forthcoming Sentinel-2 satellites, due for launch in 2012.

"Ideally, we might have weekly satellite acquisitions, but cloud cover makes that unfeasible," explained Dr Sephton.

"Instead, we need only two to four satellite images per growing season, which are fed into a sophisticated crop growth model.

"With TalkingFields the emphasis is on service: we're not giving raw satellite data straight to farmers. Instead, we advise them directly on actions to be taken throughout the growing season."

Following a 2009 feasibility study, TalkingFields is now being demonstrated in real fields, led for ESA by German Earth observation company VISTA with partners PC-Agrar, a German company specializing in providing farm management information software, and Ludwig Maximillians University Munich, which developed the hydrological and agricultural production model.

Farmers access TalkingFields via familiar farm management systems. "The quality of farming advice improves dramatically when all the available information is used," said Heike Bach of VISTA.

"Factors like crop variety, seeding date, row distance and fertilization measures conducted so far are stored in the farm management system.

"Since TalkingFields is integrated with this software, we also have access to this information, improving our crop growth models."

Large intensive farms across Germany and Russia are participating in the demonstration. Customers can choose from a portfolio of services, such as estimating a crop's yield some two to four weeks before harvest.

Even before a farmer decides to use precision farming, he can obtain a detailed cost-benefit analysis for each field. Daily information on biomass and density will help to protect crops by revealing the onset of plant disease.

TalkingFields is being supported through the Integrated Applications Promotion (IAP) program of ESA's Telecommunications and Integrated Applications Directorate.

IAP builds services for new groups of users by combining different space and terrestrial systems in novel ways.

Image 1: TalkingFields is an initiative of ESA's Integrated Application Promotion program, aimed at producing an end-to-end precision farming information service. The farmer requests advice for an area defined using satnav. Satellites gather information on the land's potential – observations over several years can reveal variations in crop growth through soil changes – as well as current crop status. These results are combined with information from field sensors such as weather conditions and soil moisture. The farmer adds in his own knowledge, and in return receives detailed satnav instructions on where and how much fertilizer to spray, for example. In principle these instructions can be fed straight into tractors or other farm equipment. Credits: TalkingFields

Image 2: Sustainable food production and food security are critical challenges. An initiative of ESA's Integrated Application Promotion program, TalkingFields will help by using space-based precision farming methods to produce crops more efficiently. For instance, by optimizing farmers' use of fertilizer and giving early warning of plant disease risks not just on a field-by-field basis but within individual fields, both costs and environmental impacts can be reduced. Credits: TalkingFields

On the Net:

- [ESA](#)
- [TalkingFields](#)
- [Sentinel-2](#)
- [VISTA GmbH](#)
- [PC-Agrar](#)
- [Ludwig-Maximilians University Munich](#)

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