

Galileo

*The European Programme for
Global Navigation Services*

Agriculture and Fisheries



Recent food security issues such as BSE and foot & mouth disease have, together with discussions about genetically modified organisms, raised consumers' concerns and affected confidence in food products. Farmers strive to improve quality, while respecting the environment. The needs of the fishing sector have also grown, ranging from day-to-day operational

support to the navigation and positioning of fishing vessels. Strict international rules governing intrusion into national waters demand that vessels are monitored to check they work only in designated areas.

Some examples of practical uses of Galileo

*** Chemical spraying**

More and more chemicals are being used to increase productivity by controlling pest and weed infestation of crops. Yet, as we become increasingly aware of the environmental impact, there is a need for better management of agricultural land. Besides, spraying chemicals where they are not needed is costly and bad for the environment.

How can Galileo help? Precise aircraft positioning enables the pilot to spray the herbicides, insecticides or fertilisers in the right places and in the correct quantities. Automatic control also produces a more even distribution, reducing the quantity used. A positioning accuracy of better than 1 m is required – and cm accuracy would be ideal. A Galileo receiver installed on the spraying vehicles will link the system to a database with other field information. For example, maps can then be generated to show where the spraying occurred.

*** Crop yield monitoring**

Yield monitoring leads not only to effective resource management and consequently significant return, but also contributes to safeguarding the environment. Better control is becoming an issue. Farmers need to be able to map the high- and low-yield areas of fields so that a varying application of chemicals can improve the yield

with minimum environmental impact and cost. The yields of individual parcels of land can be monitored every season.

Galileo positioning receivers on harvesters will lead to more automated systems and higher accuracy, drawing on the data stored in databases. By looking at yield maps, farmers can see where to take samples for analysis, with the positioning system allowing specific areas to be targeted.



*** Crop acreage and livestock tracking**

Knowing which agricultural land is under crops and their exact areas is of key interest for managing and controlling subsidies. Precise measurements are the basis

of the agricultural parcel registry. When farmers need to declare their actual cropped area, they normally rely on historical cadastre documents that show property lines, not the actual agricultural parcels that change every season. It is at this declaration stage when positioning information could be transformed into accurate surface area measurements. Galileo could replace the traditional but imprecise, expensive and time-consuming measuring techniques using wheels and tapes. Furthermore, it would help to integrate measurements directly into Geographical Information Systems for better land-use management.

Farmers can also benefit by tracking their livestock more efficiently. Transponders linked to a central database would trace livestock and products at all stages of their production, preparation, transport and marketing. This could improve farmers' management of direct aid.



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* **Navigation and monitoring of fishing vessels**

The long journeys and the global nature of fishing activities mean that satellites provide the only viable and reliable method of navigation. Modern fishing vessels travel the globe pursuing commercial returns, at the same time sending regular position reports (position, speed and heading) to their shore-based control centres, and occasionally catch information and a breakdown of fishing effort. National and international laws mean that non-compliance can prove very expensive in terms of fines and withdrawal of fishing rights.

* **Monitoring fishing applications**

Fishermen need accurate position information to locate their assets. Traditional methods often rely on local knowledge and historical patterns of net laying. Transmissions back to the mothership from free-floating and static devices would improve fishing capabilities. Uninterrupted views of the sky make the high seas an ideal environment for drawing on satellite technology.

Galileo Benefits

By integrating Galileo with other technologies, the Agriculture and Fisheries community can benefit from:

- improved monitoring of the distribution and dilution of chemicals
- improved parcel yield from customised treatment
- more efficient property management
- more effective information exchange between vessels and stations
- improved fishing capabilities
- improved navigation aids for fishermen

How is Galileo different from other systems?

- ✓ increased accuracy, service guarantees, certification and liability of the service operator
- ✓ traceability of past performance and operation transparency
- ✓ increased availability of signals in demanding environments

Galileo: The European Satellite Navigation Programme is a joint initiative of the European Commission and the European Space Agency. Galileo will offer positioning and timing services worldwide.

For additional information, please contact the Galileo Joint Undertaking: JU@galileo-pgm.org