SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
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AN INTEGRATIVE APPROACH OF USING SATELLITE-BASED INFORMATION FOR PRECISION FARMING: TALKINGFIELDS

Abstract

Sustainable food production and food security are central challenges of this century. Limited acreage and high demand for resources for food and bio-energy production drive up prices. One promising way of solving these problems is to achieve higher efficiency in production via precision farming.

For this, a geo-information service is needed to communicate the required spatial information to the farmers. Yet at present, the spatial information from satellite data about crop development is not yet fully operationally available; the communication between geo-information service, farmer and field is lacking; and satellite-based, integrated applications are missing.

TalkingFields is an initiative intended not only to overcome these shortages but also to provide farmers with affordable and low-time consuming, end-to-end precision farming services to increase production efficiency. TalkingFields is based on a geo-information service that applies satellite-based data sources and techniques in an integrative way.

Satellite sensors from Earth Observation deliver spatial information about the crop development. In-field sensors, where available, measure weather conditions. The farmer communicates the applied and planned farming measures to the geo-data service. An agricultural geo-information service integrates all input data, and translates it into advice on what farming measures are required. The recommended measures are delivered to the farmer, who uses satellite navigation for auto-steering and realization of these site-specific farming activities. Farmers will have access to these services in a fully transparent way, requiring little additional effort from their side, and including the possibility of further assistance if necessary.

The feasibility of this integrative application of space techniques for precision farming was studied in the frame of ESA's ARTES 20 Integrated Applications Promotion (IAP) Programme. The project is now entering a Demonstration phase, where the following services will be developed and demonstrated:

- Cost-efficient solution for improved soil probing using satellite-based zone maps.
- Cost-benefit analysis to find out whether precision farming is economically feasible for the farm under investigation using a field-by-field economic analysis.

- Provision of application maps for site-specific farming (plant protection, fertilisation, seeding) to gain valuable information for crop management by using zone maps showing differences in growth.

- Monitoring of crop development and yield estimation with a 2 week forecast capability.

In summary, cost-saving and eco-friendly technologies integrated towards the provision of services meeting farmers' needs are applied to cultivate fields precisely, to account for the changing soil conditions and to optimize yield formation. This concept allows implementing precision farming via TalkingFields.