Advanced Monitoring of Tree Crops for Optimized Management


mzude@atb-potsdam.de

3D-Mosaic targets optimized water efficiency that will prune the environmental footprint of food production. Monitoring and management of tree crops is a multifactorial problem and solutions need to address the high spatio-temporal variability. The application of ICT in agriculture has a high potential to cope with this problem.

**Partners**

3D-Mosaic brings together expertise by 11 partners from seven ICT-AGRI (ERA-NET-FP7) member countries to build an integrated ICT and robotic (automation) solution.

**Concept**

3D-Mosaic targets …

… the monitoring of spatial variability in tree crops and delineation of management zones considering soil and plant data by means of ICT and robotic solutions for approaching the automation of horticultural processes

**Outcome**

WP 1 – Autonomous Platform:
In the 3D-Mosaic, an algorithm was developed for mapping trees in an orchard. The algorithm is currently being implemented in a SLAM solution for our platforms.

WP 2 – Vision Systems:
In the 3D-Mosaic, systems were integrated on the platform for data acquisition and software tools were developed for canopy analyses.

WP 3 – Facilities:
In the 3D-Mosaic, software for fitting of photon transport in biological samples with one or more layers. Novel sensors for measuring fruit water content were approached.

WP 5 & 6 – DSS Tool:
Based on cooperative field trials (WP 4) the GIS was developed. In 3D-Mosaic, the commercial application were extended by algorithms for hotspot analysis to enable DSS.

**Dissemination**


More articles and newsletter: [http://www.atb-potsdam.de/3D-MOSAIC/](http://www.atb-potsdam.de/3D-MOSAIC/)

Consistent with findings in precision agriculture of field crops, correlation was found between soil electric conductivity and plant parameters. In preliminary experiments in the subtropics, interactions of soil and vegetative growth, yield, and fruit quality were indicated. The data were supplied by means of novel sensors or new approaches in data processing, providing the necessary prerequisites for numerous spatially resolved measurements.

Finally some notes from (i) a FARMER perspective: “farming with sensors is so much easier”; and (ii) the external project advisor: “the level of enthusiasm was infectious”