

1st Project Newsletter

3D- Mosaic



Advanced Monitoring of Tree Crops for Optimized Management

How to cope with variability in soil and plant properties?

Present conditions or state-of-the-art

3D-Mosaic aims to improve irrigation in fruit crops in terms of water use, yield, and fruit quality. In the context of current global changes, assuring the supply of produce and increasing economic viability are priority targets within plantation management. In the cultivation of tree crops, water is a critical input factor and irrigation is necessary in all European countries. As a matter of fact, input requirements in an orchard vary in space and time. Spatial patterns of soil and plant properties can be regarded as a *3D-Mosaic*.

Irrigation today is managed at the orchard level and not at the tree level. Uniform irrigation frequently creates sub-optimum conditions with some parts of the orchard having insufficient water, while other parts suffer from water logging and oxygen shortage. Consequently, water is wasted or yield and fruit quality are reduced. Plant data considering the spatially-resolved soil characteristics provide information vital for orchard management. Until now, lack in automated data acquisition literally limits the use of plant parameters orchard management.

Kick-off meeting

3D-Mosaic partners attended the first project meeting held at the Leibniz Institute of Agricultural Engineering in Potsdam in June 2011, when Dr. Christian Grugel, Director General of the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), presented the grant contracts to the national project partners. *3D-Mosaic* is a project of the EU FP7 ERA-Net ICT-Agri (Information and Communication Technologies in Agriculture).



News: 1st field trial in Adana Nov. 2011



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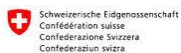
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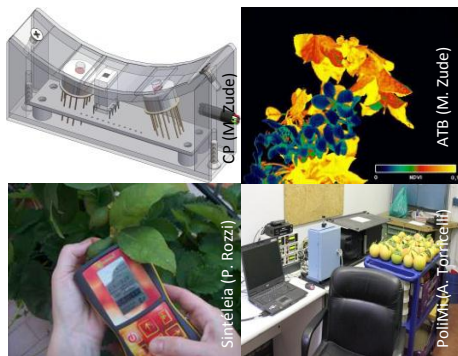
Concept

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

Software components (2D and 3D vision, soil-plant models, GIS, navigation, wireless communication, sensor calibration,

irrigation control, protocols) will be adapted with hardware components (platform, cameras, spectroscopic sensors). A DSS prototype will be developed for evaluating the potential of sensor for management of precision irrigation in orchards. Within an improved orchard management system *3D-Mosaic* provides solutions for improving food quality. Labour demands are transformed towards workplaces with higher qualification. Due to the conceptual character of the approach additional application areas such as greenhouses, viticulture, and precision agriculture can be expected.

<http://www.atb-potsdam.de/3D-MOSAIC/>



a)



c)



b)

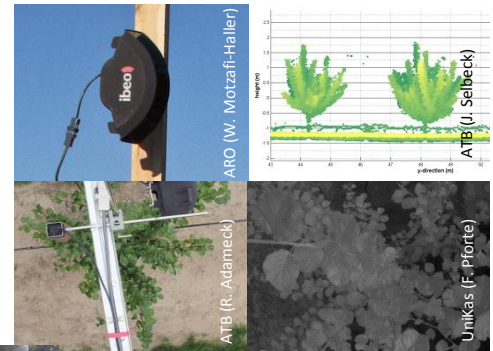
Autonomous platform for carrying different sensors (WP 1):

a) fruit sensor (WP 3)

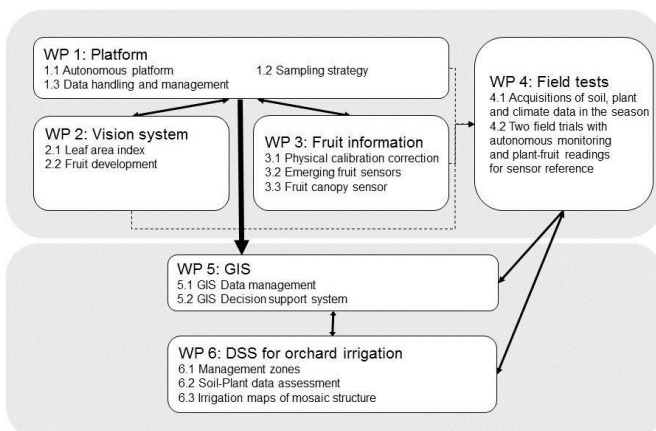
b) vision system (WP 2)

c) field data (WP 4) and

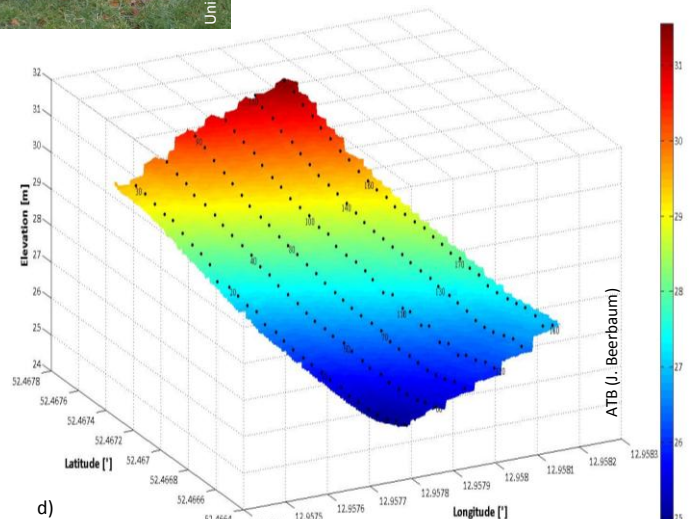
d) GIS (WP5)



Management



The project is formed by 11 partners including 9 research institutions (EU member and AC) and 2 SME. Additionally, 2 external advisors will support the progress. The work load is organized in 6 Work Packages (WP), while the partners will regularly meet within 3 thematic groups and WP.



d)

Facts:

ERA-Net ICT-Agri transnational project

Coordinatio n: Leibniz Institute for Agricultural Engineering Potsdam-Bornim (Prof. Dr. Manuela Zude)

Funding: Ministries and Agencies from participating partner countries; funding sum 890 T Euro

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