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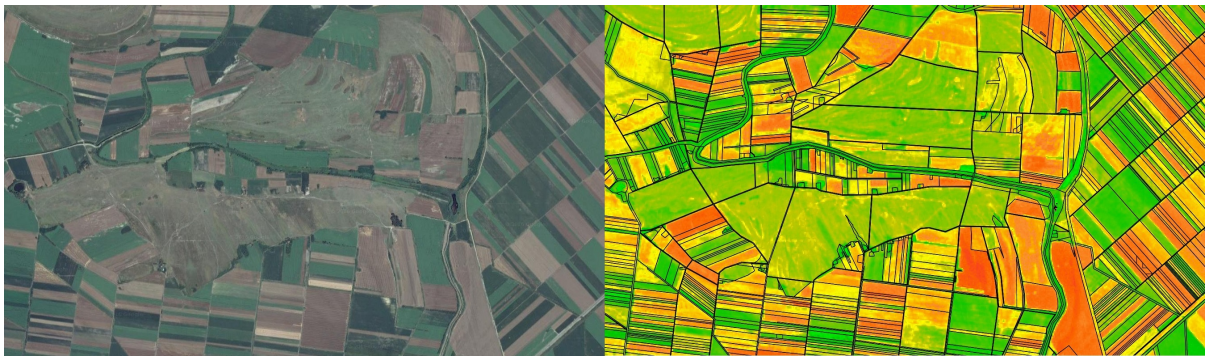
Comparison of two different measurement techniques for automated determination of plum tree canopy cover



Title	Comparison of two different measurement techniques for automated determination of plum tree canopy cover
Title (native language)	
Category	• Recording or mapping technology
Short summary for practitioners (Practice abstract) in English)	The transnational project "3D Mosaic" deals with the optimisation of water and fertiliser efficiency in orchards. Detection of the canopy coverage at tree level provides information about the growth capacity of the tree and enables estimation of the possible yield or the influence of reduced water supply in an orchard. Detection must be performed in an automated mode that may be achieved by means of two optical approaches: NIR image analysis, with the calculation of leaf coverage within the image versus non-covered area, and counting the number of laser-scanner (LiDAR) hits per tree. The present study, conducted in an experimental orchard of 180 plum trees, aimed to evaluate and compare these methods using a vertical top-down viewing direction for the sensors.
Short summary for practitioners	
Website	
Audiovisual material	
Links to other websites	
Additional comments	
Keywords	Farming practice | Plant production and horticulture | Water management | Energy management
Additional keywords	
Geographical location (NUTS)	EU
Other geographical location	
Cropping systems	Tree crops
Field operations	Crop and soil scouting
SFT users	Farmer | Contractor
Education level of users	Primary education | Secondary education | Apprenticeship or technical school education | University education
Farm size (ha)	0-2 | 2-10 | 10-50 | 50-100 | 100-200

Scientific article

Title	Comparison of two different measurement techniques for automated determination of plum tree canopy cover
Full citation	Pforte, F.; Selbeck, J.; Hensel, O. (2012). Biosystems Engineering, DOI:10.1016/j.biosystemseng.2012.09.014

Effects of this SFT

Productivity (crop yield per ha)	Some increase
Quality of product	No effect
Revenue profit farm income	Some increase
Soil biodiversity	No effect
Biodiversity (other than soil)	No effect
Input costs	Some decrease
Variable costs	Some decrease
Post-harvest crop wastage	Some decrease
Energy use	Some decrease
CH4 (methane) emission	No effect
CO2 (carbon dioxide) emission	No effect
N2O (nitrous oxide) emission	No effect
NH3 (ammonia) emission	No effect
NO3 (nitrate) leaching	No effect
Fertilizer use	No effect
Pesticide use	No effect
Irrigation water use	Some decrease
Labor time	No effect
Stress or fatigue for farmer	Some decrease
Amount of heavy physical labour	No effect
Number and/or severity of personal injury accidents	No effect
Number and/or severity of accidents resulting in spills property damage incorrect application of fertiliser/pesticides etc.	No effect
Pesticide residue on product	No effect
Weed pressure	No effect
Pest pressure (insects etc.)	No effect
Disease pressure (bacterial fungal viral etc.)	No effect

Information related to how easy it is to start using the SFT

This SFT replaces a tool or technology that is currently used. The SFT is better than the current tool	no opinion
The SFT can be used without making major changes to the existing system	no opinion
The SFT does not require significant learning before the farmer can use it	disagree
The SFT can be used in other useful ways than intended by the inventor	agree
The SFT has effects that can be directly observed by the farmer	disagree
Using the SFT requires a large time investment by farmer	agree
The SFT produces information that can be interpreted directly	agree

View this technology on the Smart-AKIS platform.

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