



**smart AKIS**  
Smart Farming Thematic Network



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION'S HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME UNDER GRANT  
AGREEMENT N. 696294

## A flexible unmanned aerial vehicle for precision agriculture



Title	A flexible unmanned aerial vehicle for precision agriculture
Title (native language)	
Category	<ul style="list-style-type: none"> <li>Recording or mapping technology</li> </ul>
Short summary for practitioners (Practice abstract) in English)	<p>An unmanned aerial vehicle (“VIPTero”) was assembled and tested with the aim of developing a flexible and powerful tool for site-specific vineyard management. The system comprised a six-rotor aerial platform capable of flying autonomously to a predetermined point in space, and of a pitch and roll compensated multi-spectral camera for vegetation canopy reflectance recording. Before the flight campaign, the camera accuracy was evaluated against high resolution ground-based measurements, made with a field spectrometer. Then, “VIPTero” performed the flight in an experimental vineyard in Central Italy, acquiring 63 multi-spectral images during 10 min of flight completed almost autonomously. Images were analysed and classified vigour maps were produced based on normalized difference vegetation index. The resulting vigour maps showed clearly crop heterogeneity conditions, in good agreement with ground-based observations. The system provided very promising results that encourage its development as a tool for precision agriculture application in small crops.</p>
Short summary for practitioners	
Website	
Audiovisual material	
Links to other websites	
Additional comments	
Keywords	Farming equipment and machinery
Additional keywords	High resolution images; Normalized difference vegetation index; Multi-spectral images; Vigour maps; Vineyard
Geographical location (NUTS)	EU
Other geographical location	
Cropping systems	Vineyards
Field operations	Crop and soil scouting
SFT users	Farmer   Contractor   Supplier
Education level of users	All
Farm size (ha)	0-2

# Scientific article

Title	A flexible unmanned aerial vehicle for precision agriculture
Full citation	Primicerio, J.; Di Gennaro, S.F.; Fiorillo, E.; Genesio, L.; Lugato, E.; Matese, A.; Vaccari, F.P. (2012). Precision Agriculture, DOI:10.1007/s11119-012-9257-6

## Effects of this SFT

Productivity (crop yield per ha)	No effect
Quality of product	No effect
Revenue profit farm income	Some increase
Soil biodiversity	No effect
Biodiversity (other than soil)	No effect
Input costs	No effect
Variable costs	No effect
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	No effect
Labor time	Some decrease
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.	Large decrease
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	agree
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	strongly agree
The SFT has effects that can be directly observed by the farmer	disagree
Using the SFT requires a large time investment by farmer	disagree
The SFT produces information that can be interpreted directly	disagree

[View this technology on the Smart-AKIS platform](#)

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