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

Evaluation of pixel- and object-based approaches for mapping wild oat weed patches in wheat fields

Title	Evaluation of pixel- and object-based approaches for mapping wild oat weed patches in wheat fields
Title (native language)	
Category	• Recording or mapping technology
Short summary for practitioners (Practice abstract) in English)	This paper compares of pixel- and object-based techniques for mapping wild oat weed patches in wheat fields using multi-spectral QuickBird satellite imagery for site-specific weed management. The research was conducted at two levels: (1) at the field level, on 11 and 15 individual infested wheat fields in 2006 and 2008, respectively, and (2) on a broader level, by analysing the entire 2006 and 2008 images. To evaluate the wild oat patches mapping at the field level, both pixel- and object-based image analyses were tested with six classification algorithms: Parallelepipeds (P), Mahalanobis Distance (MD), Maximum Likelihood (ML), Spectral Angle Mapper (SAM), Support Vector Machine (SVM) and Decision Tree (DT). The results showed that weed patches could be accurately detected with both analyses obtaining global accuracies between 80% and 99% for most of the fields.
Short summary for practitioners	
Website	
Audiovisual material	
Links to other websites	
Additional comments	
Keywords	Farming practice | Plant production and horticulture
Additional keywords	Broad- and field-level weed mapping; Herbicide savings; Pixel- and object-based image analysis; Remote sensing; Weeds
Geographical location (NUTS)	EU
Other geographical location	
Cropping systems	Arable 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 | 200-500 | >500

Scientific article

Title	Evaluation of pixel- and object-based approaches for mapping wild oat (Avena sterilis) weed patches in wheat fields using QuickBird imagery for site-specific management
Full citation	Castillejo-González, I.L.; Peña-Barragán, J.M; Jurado-Expósito, M; Mesas-Carrascosa, F.J.; López-Granados, F. (2014). European Journal of Agronomy, DOI:

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	No effect
Variable costs	No effect
Post-harvest crop wastage	No effect
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	No effect
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	Some decrease
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	no opinion
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	agree
Using the SFT requires a large time investment by farmer	no opinion
The SFT produces information that can be interpreted directly	agree

View this technology on the Smart-AKIS platform.

SMART AKIS PARTNERS:

This factsheet was generated on 2018-Apr-03 11:57:16.