



**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 real-time optimisation system for automation of furrow irrigation



Title	Areal-time optimisation system for automation of furrow irrigation
Title (native language)	
Category	<ul style="list-style-type: none"> <li>• Reacting or variable rate technology</li> </ul>
Short summary for practitioners (Practice abstract) in English)	<p>An automated real-time optimisation system for furrow irrigation was developed and tested in this study. The system estimates the soil infiltration characteristics in real time and utilises the data to control the same irrigation event to give optimum performance for the current soil conditions. The main components of the system are as follows: the sensing of flow rate and a single advance time to a point approximately midway down the field, a system for scaling the soil infiltration characteristic and a hydraulic simulation program based on the full hydrodynamic model. A modem is attached to a microcomputer enabling it to receive signals from the flow meter and advance sensor via a radio telemetry system. Sample data from a furrow-irrigated commercial cotton property are used to demonstrate how the system works. The results demonstrate that improvements in on-farm water use efficiency and labour savings are potentially achievable through the use of the system.</p>
Short summary for practitioners	
Website	
Audiovisual material	
Links to other websites	
Additional comments	
Keywords	Water management
Additional keywords	

Geographical location (NUTS)	EU
Other geographical location	Global
Cropping systems	
Field operations	Irrigation
SFT users	Farmer   Contractor
Education level of users	All
Farm size (ha)	0-2   2-10   10-50   50-100   100-200

## Scientific article

Title	A real-time optimisation system for automation of furrow irrigation
Full citation	Koech, R.K.; Smith, R.J.; Gillies, M.H. (2014). Irrigation Science, DOI:10.1007/s00271-014-0432-6

## 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	Some decrease
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.	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	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	agree
The SFT can be used in other useful ways than intended by the inventor	no opinion
The SFT has effects that can be directly observed by the farmer	agree
Using the SFT requires a large time investment by farmer	disagree
The SFT produces information that can be interpreted directly	no opinion

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

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