



A portable electronic nose for detection of pests and plant damage



Title	Aportable electronic nose for detection of pests and plant damage
Title (native language)	
Category	<ul style="list-style-type: none"> Recording or mapping technology
Short summary for practitioners (Practice abstract) in English)	<p>Agricultural pests are responsible for millions of dollars of crop losses and control costs every year. To reduce these losses and minimize control costs, new methods to detect pests and/or pest damage must be investigated in order to optimize control measures. One such method evaluated in this study was to detect the chemicals released by pests or pest-damaged products. A portable device was developed to draw volatiles from pests or pest-damaged products over carbon black–polymer composite sensors and measure the change in resistance for each sensor. The device successfully sampled pest and plant volatiles and these volatiles were detected using carbon black–polymer composite sensors. These results indicated an electronic nose is a feasible approach to detect pests and/or pest damage.</p>
Short summary for practitioners	
Website	
Audiovisual material	
Links to other websites	
Additional comments	
Keywords	Plant production and horticulture
Additional keywords	Electronic nose; Pest control; Portable sensors; Carbon black–polymer composites; Integrated pest management
Geographical location (NUTS)	EU
Other geographical location	Global
Cropping systems	
Field operations	Crop protection 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

Scientific article

Title	Development of a portable electronic nose for detection of pests and plant damage
Full citation	Lampson, B.D.; Han, Y.J.; Khalilian, A.; Greene, J.K.; Degenhardt, D.C.; Hallstrom, J.O. (2014). Computers and Electronics in Agriculture, DOI:10.1016/j.compag.2014.07.002

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	No effect
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	Some decrease
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	Some decrease
Weed pressure	No effect
Pest pressure (insects etc.)	Some decrease
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	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	no opinion
Using the SFT requires a large time investment by farmer	no opinion
The SFT produces information that can be interpreted directly	no opinion

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

SMART AKIS PARTNERS:

