

Using Remote Sensing to improve canegrub management in North Queensland cane fields

Project details

Key Focus Area

Pest, disease and weed management

Project name

Delivery of remote sensing technology to combat canegrubs in Queensland cane fields

Project number

2015/038

Research is hoping to use more affordable satellite imagery to bring cane grub mapping a step closer to being a viable tool for the sugarcane industry.

One main obstacle in the fight against canegrubs is the difficulty to predict future damage in order to strategically implement chemical control.

Remote sensing offers the opportunity to proactively deal with emerging grub damage on a regional level before the problem gets out of hand.

A previous remote sensing project demonstrated the high accuracy that can be achieved to identify damage using the high resolution GeoEye-1 imagery.

However, these images are expensive. Therefore, this current project is examining the feasibility of using the lower resolution Spot 6/7 imagery to produce reliable/more affordable risk maps.

If feasibility is demonstrated, then the potential to develop a commercialisation plan with the industry will be explored.

SRA's work showed that Spot6 imagery is a reliable method to detect damage with acceptable accuracy rates (81% - 91%). The images show the difference in resolution between Spot 6 and GeoEye imagery. Despite the fact that the GeoEye-1 image produced maps with higher grub detection rates (97.73% - 100%), it tended to overestimate grub damage especially in areas with wind, rat, pig or cockatoo damage and/or sprawling.

SPOT-6 imagery resulted in fewer incorrect results due to a reduced likelihood of overestimating damage levels. SPOT-6 imagery, therefore, appears to have good potential as a cheaper alternative to the higher spatial resolution and costly GeoEye-1 imagery. A canegrub risk map can then be produced based on information generated from satellite image in conjunction with ground-truthing. Based on a survey conducted by SRA, growers preferred a digital map (accessible as a shape file) with exact areas of grub damage indicated on their farm.

Discussions are taking place with the aim of delivering this technology directly to cane growers through productivity services or other industry organisations.

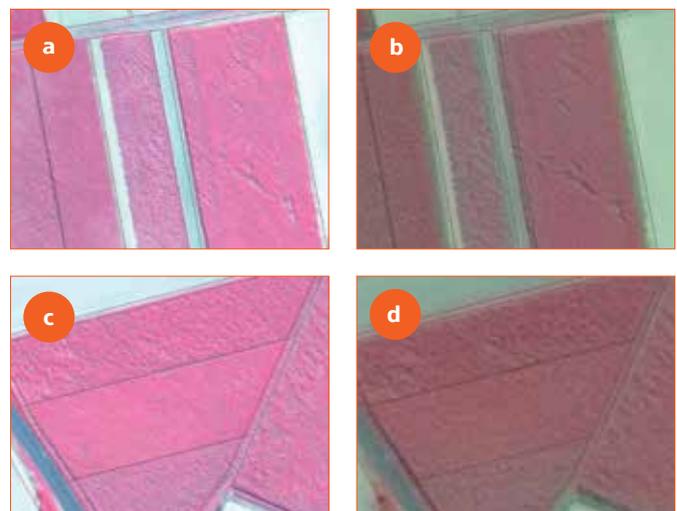


Figure 1: Figures (a) and (c) show sugarcane blocks with lodging in the higher spatial resolution GeoEye-1 imagery and subsets (b) and (d) show the corresponding areas in the SPOT-6 imagery.



Figure 2: Grub damage as it appears using Satellite Imagery. Red colour reflects healthy cane while the green colour in this image indicates canegrub damage.



Figure 3: A canegrub risk map showing locations of grub damage in Mulgrave based on information generated from the satellite image and ground-truthing in the field.