Department of Agriculture and Food
GOVERNMENT OF WESTERN AUSTRALIA

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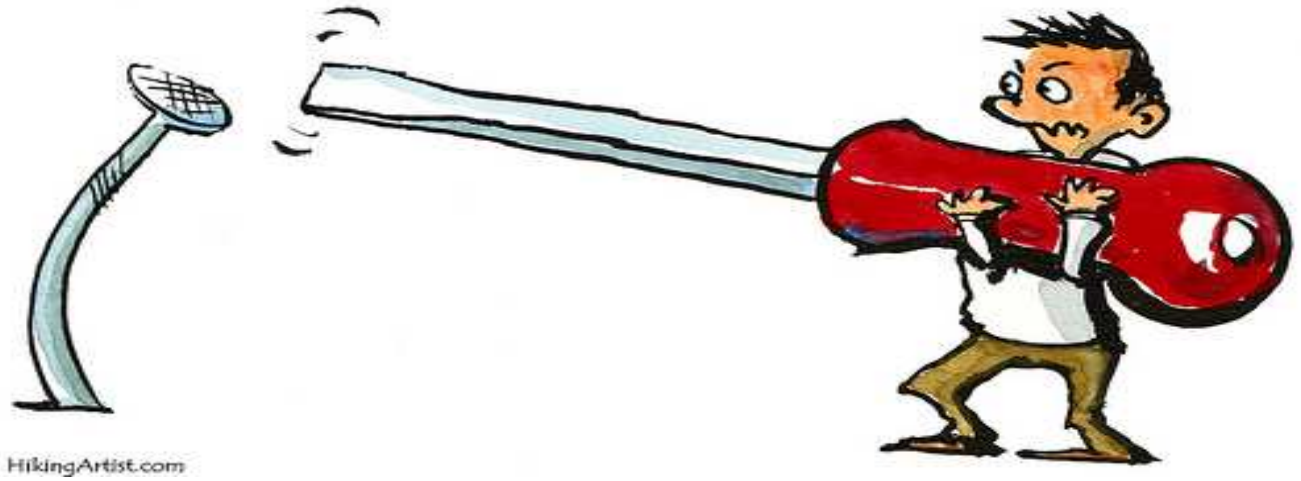
FERTILISER STRATEGIES, DRONES AND APPS – NEW APPROACHES TO PEST MANAGEMENT

Christian Nansen,
February 2014

CROP updates

Having the right technologies or tools….

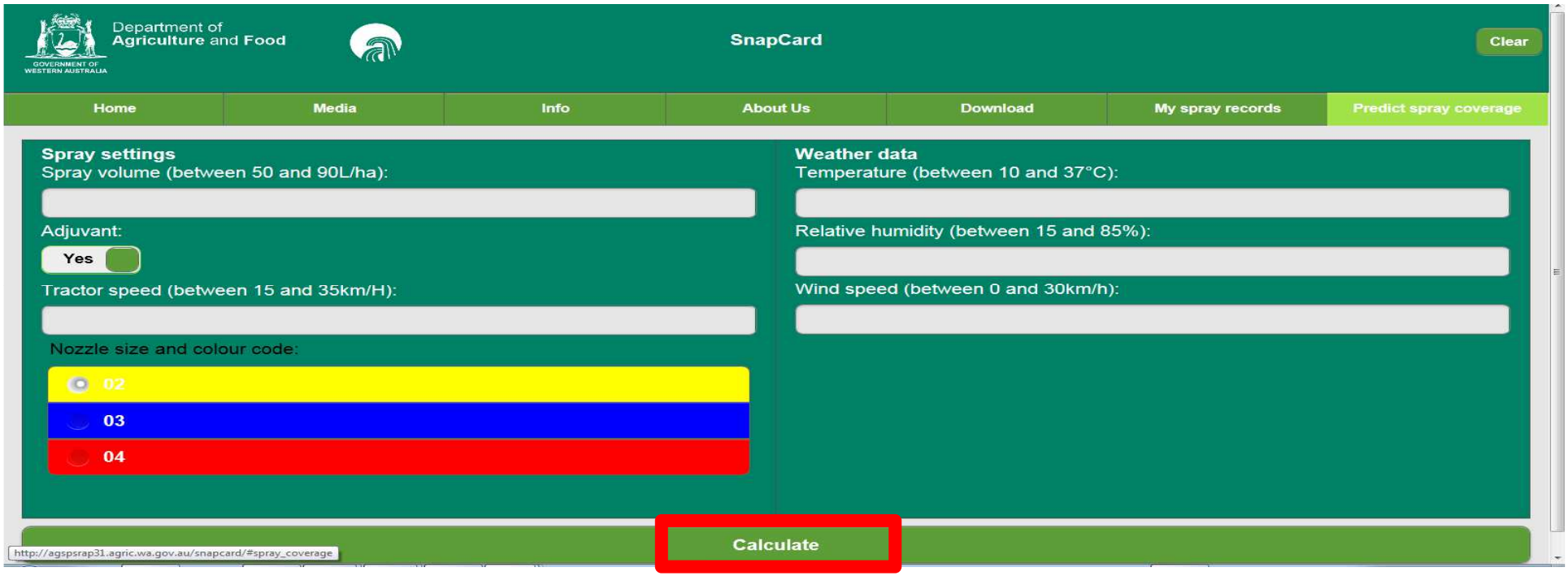


How can we cost-effectively determine whether a pest is present or not?

What factors impact the performance of pesticide spray applications?

A phone App and website to optimize spray applications

A phone App and website to optimize spray applications



Tweeking the system before spraying tomorrow…

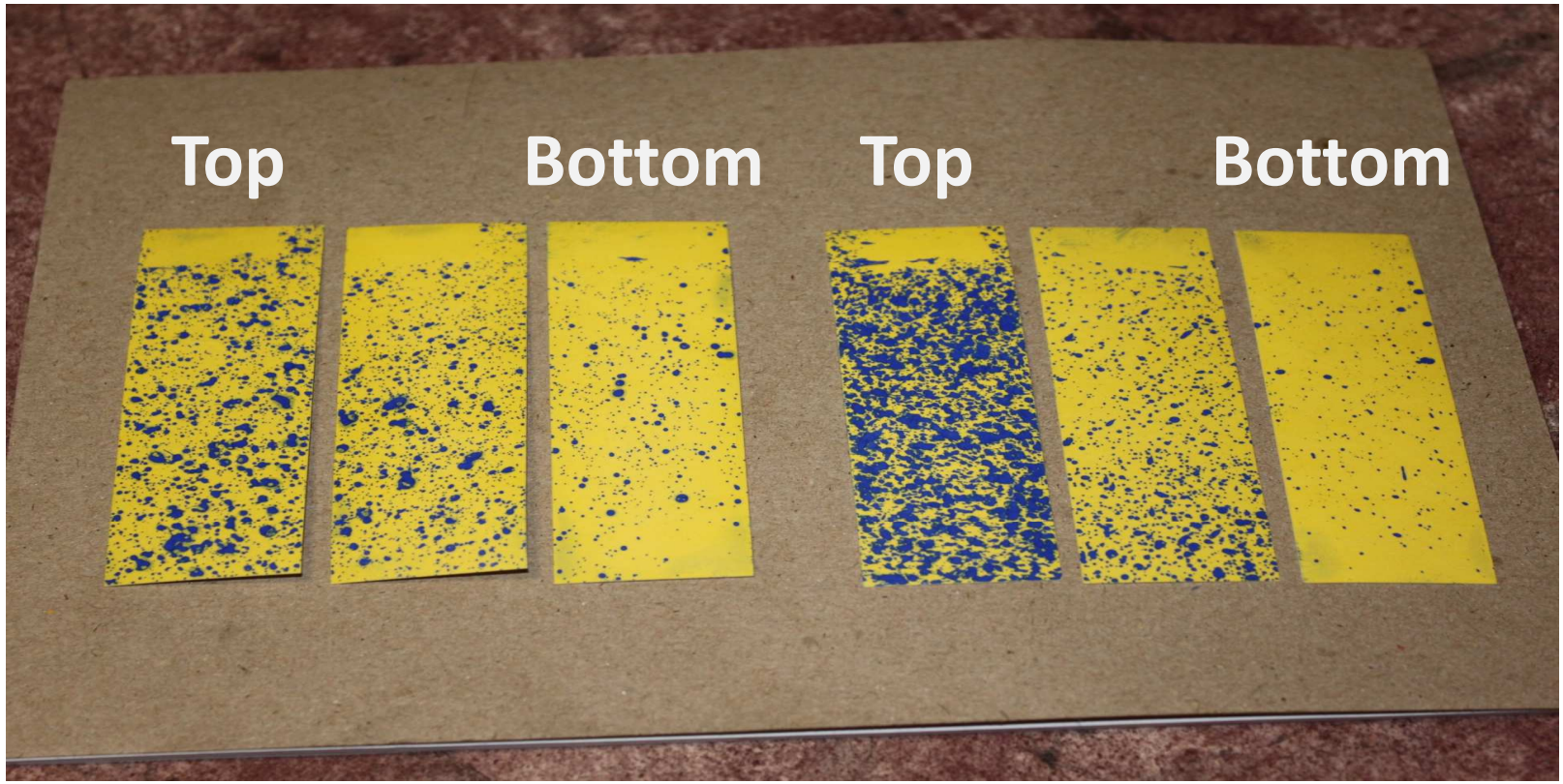
Adjuvant	0
Volume	60
Size	2
Speed	15
Temp	16
Wind	5
Rel humidity	30
Coverage	5.2

When rushing through the paddock…

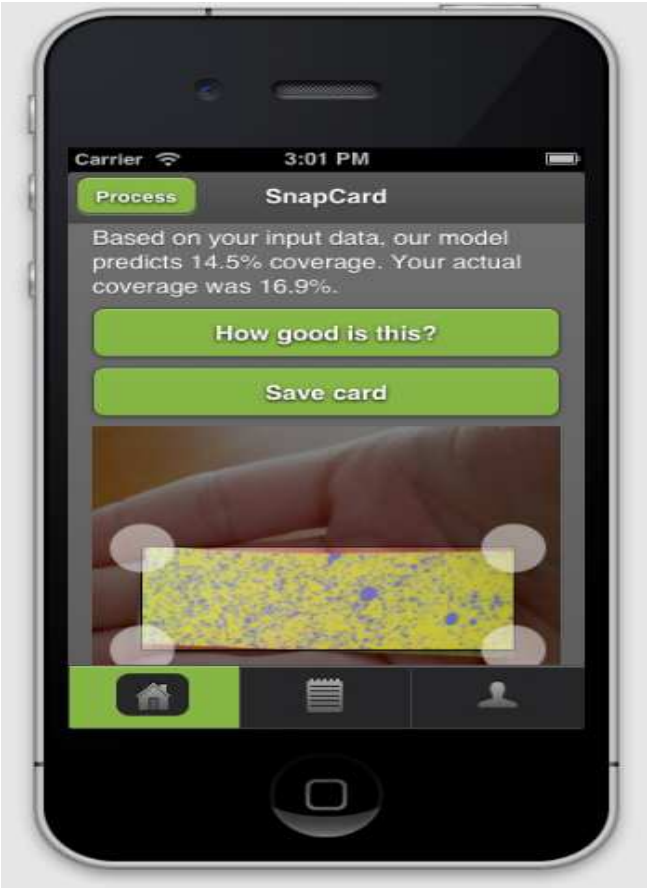
Adjuvant	1
Volume	60
Size	3
Speed	30
Temp	20
Wind	10
Rel humidity	40
Coverage	10.9

Canopy penetration of spray applications

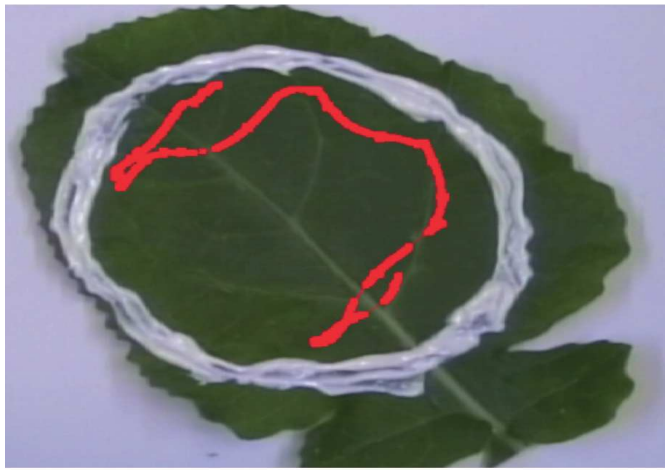
Canopy penetration of spray applications

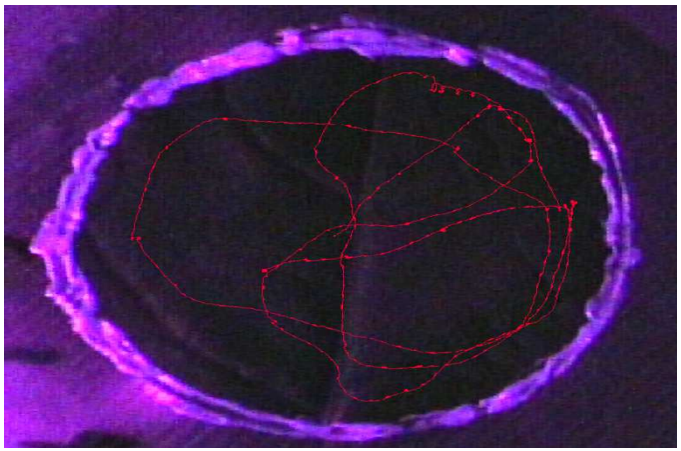


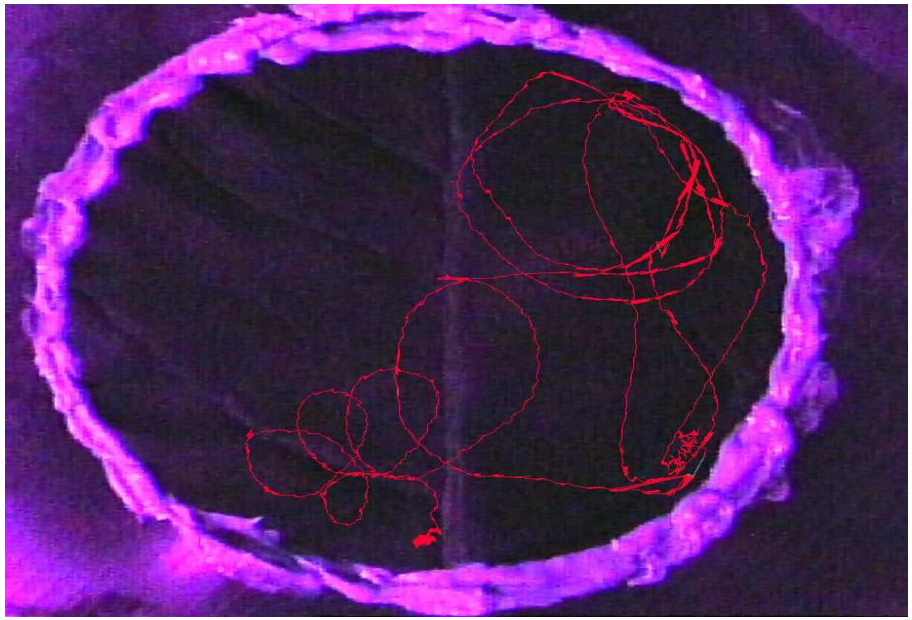
Using phone App for quality control of spray applications



The consequences of incomplete spray coverage

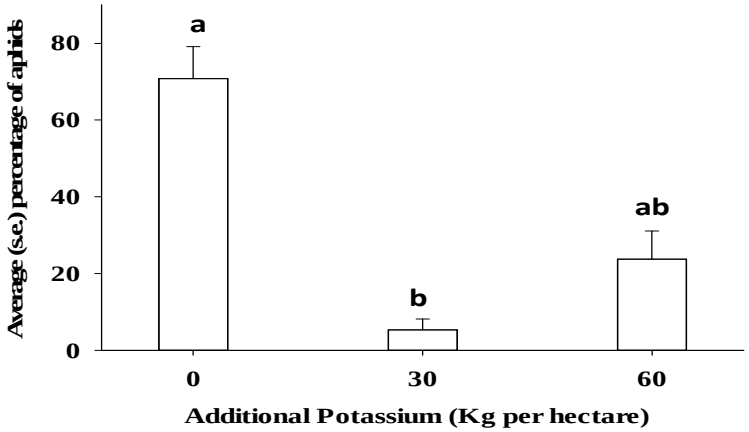


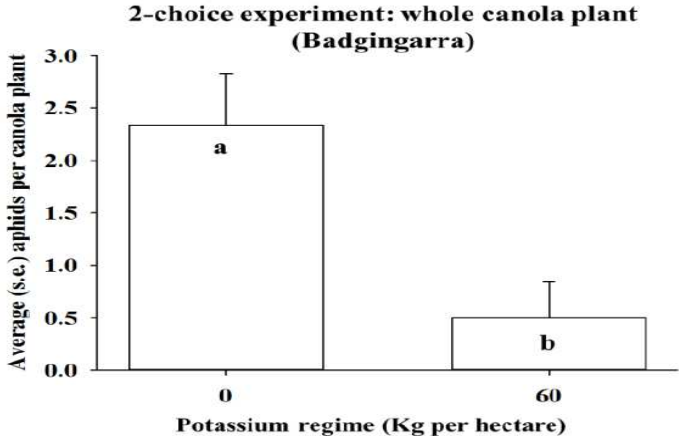




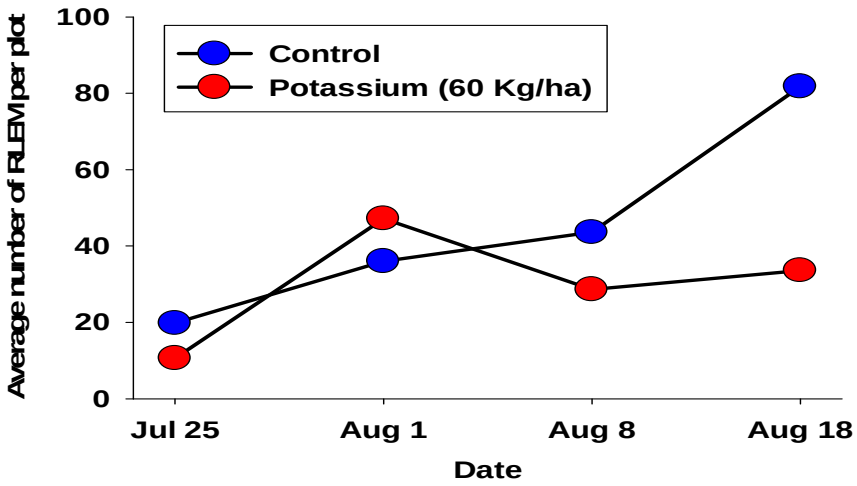
So insects feed and distribute themselves non-randomly…

Using fertilizers to manipulate distribution of pests – cabbage aphids





Using fertilizers to manipulate distribution of pests – redlegged earth mites



Physiologia Plantarum 133: 682–691. 2008

REVIEW

The effect of potassium nutrition on pest and disease resistance in plants

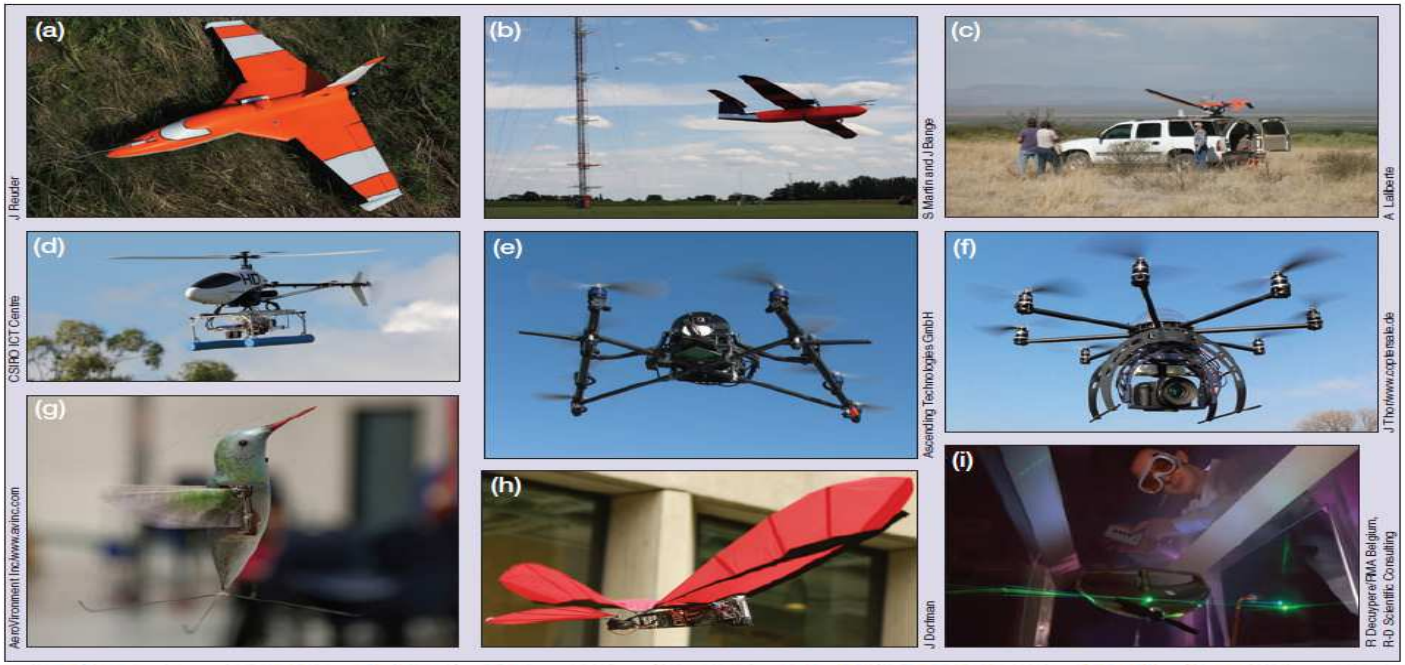
Anna Amtmann*, Stephanie Troufflard and Patrick Armengaud

Plant Science Group, Institute of Biomedical and Life Sciences, University of Glasgow, Glasgow G12 8QQ, UK

a large number of field and glasshouse trials. A publication from the International Potash Institute (Perrenoud 1990) reviewed more than 2000 studies. The general outcome of this compilation was that application of K fertilizer decreased the incidence of diseases in most cases but sometimes had no effect or even the opposite effect. The beneficial effect of K was most obvious for fungal and bacterial diseases where 70 and 69% of the studies reported a decrease of disease incidence. A decrease of insects and mites was reported in 63% of the studies. By contrast, viral infections were more frequent in plants with high K status with only 41% of studies reporting a decrease and 52% reporting an increase in disease occurrence. A similar picture was presented in a recent review chapter by Prabhu et al. (2007). The effect of K on disease occurrence obtained in more than 200

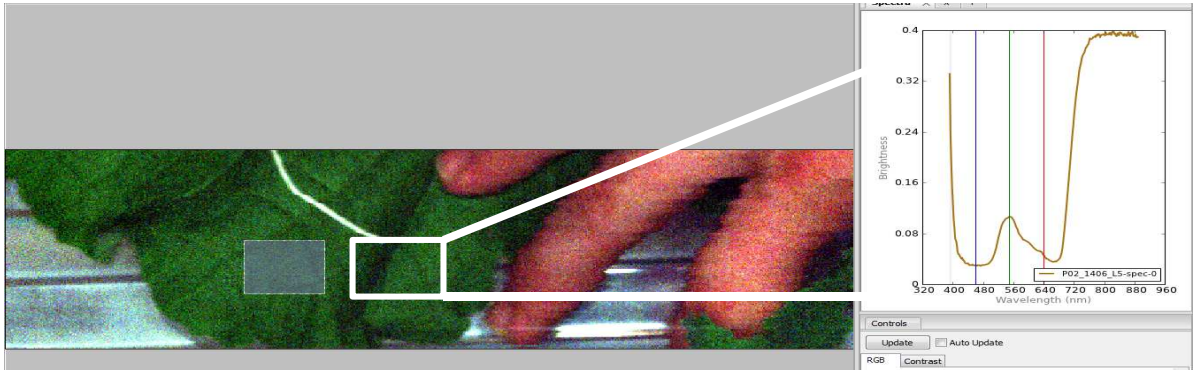
Lightweight unmanned aerial vehicles will revolutionize spatial ecology

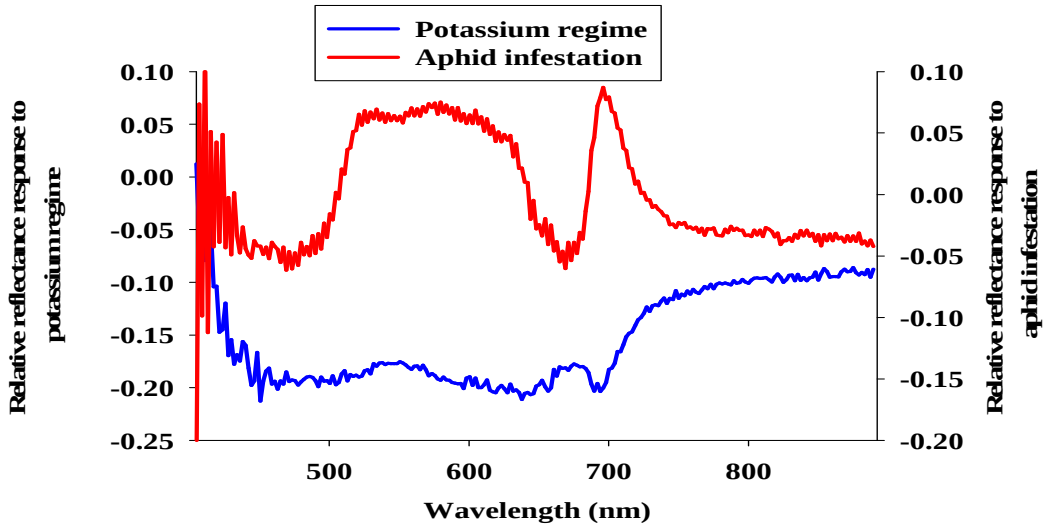
Karen Anderson* and Kevin J Gaston



Front Ecol Environ 2013; 11(3): 138–146, doi:10.1890/120150 (published online 18 Mar 2013)

Remote sensing of crop response to potassium

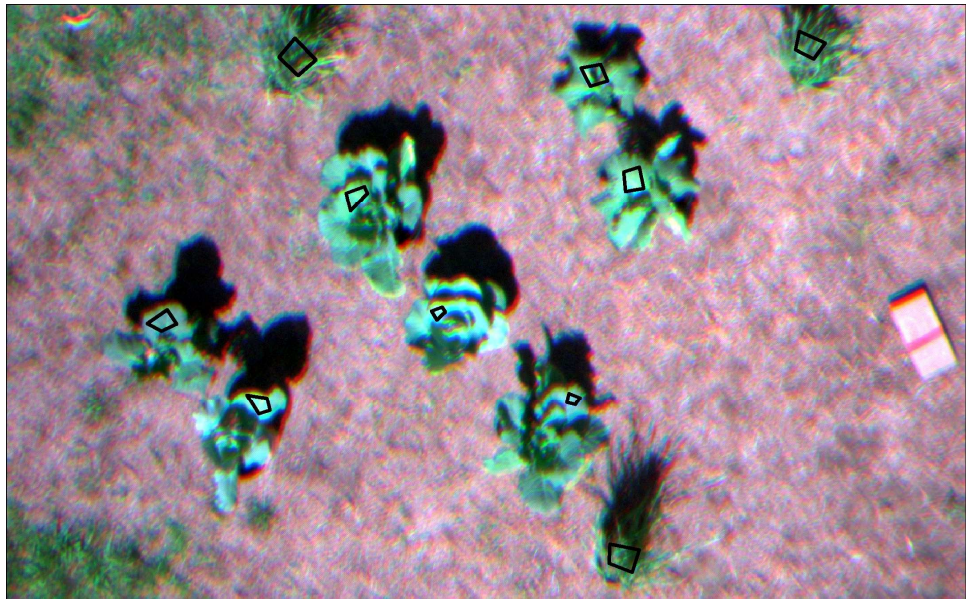




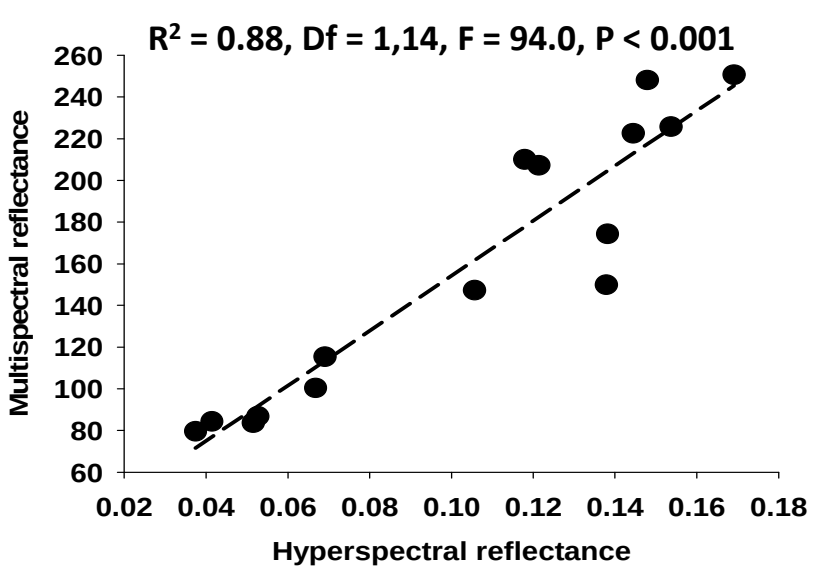
Remote sensing of crop response to insect-induced stress

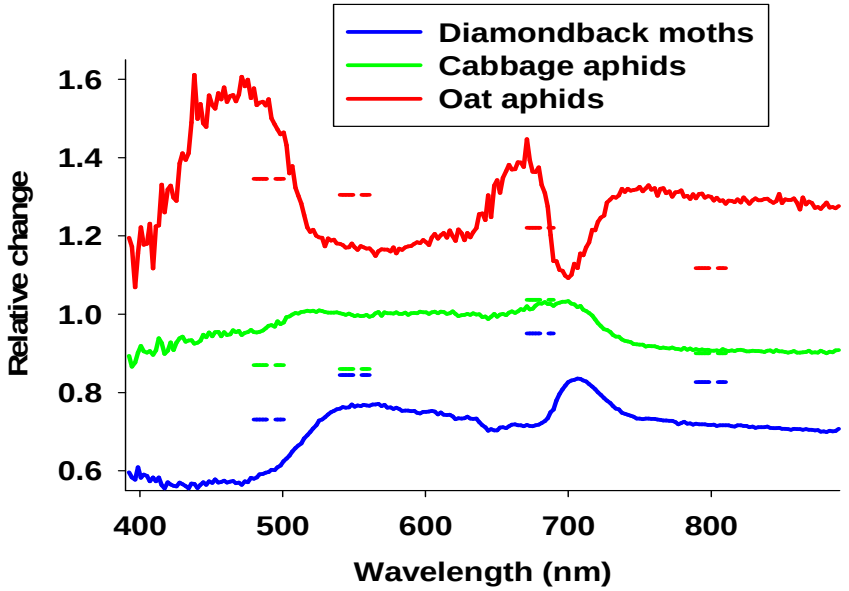
Remote sensing of pest induced stress in crops

Cabbage: control, aphids and DBM
Wheat: control and aphids



Remote sensing of crop response to insect-induced stress





Strong correlation between lab and field

Marked variability in crop responses to stressors

The pest management strategy we will be promoting

Find out how to use fertilizers to reduce the crop susceptibility to pests

Develop perimeter fertilizer treatments to optimize scouting

Develop remote sensing technologies to automate stress detection in growing crops

Develop ways to optimize spray applications

We predict that this pest management strategy will:

- **Reduce the number of insecticide spray applications**
- **Reduce the portions of paddocks subjected to insecticide spray applications**
- **Increase the overall performance of insecticide spray applications**
- **Reduce the reliance on insecticides**
- **Reduce the risk of target pests developing resistance**

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