Remote Sensing of Pests

Practical Applications & Significance in Contemporary Crop Protection

Colin Carter – Landseer Limited
Context – Changing Landscape for Crop Production

The Key Drivers

• Landscape for Crop Protection options being redrawn
  • Loss of key actives – especially broad spectrum products
  • New technologies, biopesticides, MD
• New pest complex is evolving
• Dispersal of production areas, increased farm size
• Political, regulatory, media scrutiny
• All of these demand an enhanced IPM approach with increased transparency of operation
• Automated pest monitoring fits well into this ............
How it works

Camera

Sticky base
Pest data can be exported as charts or Excel

- Trapview provides a data history for analysis / audit purposes and can archive previous years data
Data Utilisation – Improve outcomes.

Optimal timing for methoxyfenozide
Egg lay / early hatch can be computed 75DD – 125DD

Depending on temperature likely to be a 7-10day window of optimum application
SYM Trap Design

AHDB Project  FV 440 Investigation into control measures for Silver Y Moth 2015-16

2016 – not self-cleaning
Horizon 2020 Project (2016-2018)

• Helped implement new improved trap design (self-cleaning unit)
• Network of 1000 traps to monitor *Helicoverpa Armigera* in tomatoes
• Generate mass data to investigate the potential for machine learning
• Evolved business model away from product-selling to one based upon data generation / forecasting based on real time situations
Trapview – Some of the Current Trap Types

• Essential premise - if you can attract the target pest you can potentially monitor it.
Trapview significance.
Mating disruption – the importance of accurate monitoring

- If males find females – disruption is NOT working.
- If males find pheromone lures in a trap – disruption is NOT working.
- Trapview can confirm this quicker than any other way – steps can be taken to avoid damage.
- What about non-target species?
  - **Blastobasis**
  - **Light brown apple moth**
  - **Winter Moth**

WSU – Tree Fruit

A Cautionary Tale - The Flame (*Axylia putris*)
Changing Pest Complex
Winter Moth 2018-2019 – Resurgence of a historic adversary
Winter Moth - Extreme pressure?

New influx likely to get repeat outcome unless pre-blossom intervention is made but what are the thresholds for action?
Summary - Remote sensing continues to develop

• Powerful tool – but must justify adoption - cost benefit trade off
• Still evolving –
  • Cover wider pest spectrum
  • Algorithm developments
  • Improving accuracy
  • Improving data transfer capacity (resolution of image)
• Data collection and analysis will be king
• Move towards machine learning site specific forecasts
• Not a prosthetic for good ground observation/ agronomy – enhances it
Monitor
Automated traps remotely monitor pest occurrences

Forecast
AI & computer vision predict and inform where pest pressure will occur in next days for 25+ pest species

Decide better
- Plan and optimize work & costs
- Improve food quality
- Increase consumer trust