Biological control strategies for outdoor vegetable production

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Carrot aphids

• **The problem:**
  
  • Willow carrot aphid (*Cavariella aegopodii*) – Parsnip Yellow Fleck virus
  • This species of aphid now exhibits resistance to pyrethroid chemistry in UK
  • No effective biopesticides available
  • Natural predator emergence – late!

• **Control strategy:**
  
  • 1) Timed beneficial insect release (flower strips and field margins) prior and during WCA migration.
    - Chrysopa
    - Aphidalia
    - Aphidius sp
  
  • 2) Wild flower margins and strips – enhancement of natural predators / food for augmented beneficial insects.

• **Measuring success:**
  
  • Aphid populations lowered
  • Aphid mummies present – Parasitic wasp activity
  • Predator numbers high – visual
  • Little or no virus (PYFV/ CMDV) in young carrot seedlings (2017 and 2018 season)
Aphid control in salads

- Focus on beetroot and celery – control in lettuce very challenging!

- Insect release to pre-empt Myzus sp migration and development
  - week 18 ➔ week 36

- Release of Aphidius colemani and Chrysoperal carnea species

- Insect release directly into crops (by hand)

- Measuring success through:
  1. Lower numbers of aphids in lettuce crops.
  2. Reduced insect contaminant complaints in factory
Carrot fly control using EPN’s

- Monitoring adults flies with sticky traps

- Prediction of carrot fly activity and egg lay using a day degree model – AHDB Pest Bulletins

- Applications of *Steinernema feltia* on crops via irrigation system or tractor sprayer application - based on work by Schroeder in the late 90’s showing that cabbage root fly populations can be reduced

- Application made from week 27 onwards to coincide with 2nd gen larval development

- Rate applied: 2-3 billion nematodes per hectare
Measuring success

**2017**

Trials using S. feltiae and S. carpocapsae
Untreated areas: = 20% carrot fly larvae damage
Treated areas: = 1% carrot fly larvae damage

**2018**

No applications made due to shortage of water on UK farm

**2019**

Use of S. feltia only (large pack sizes available)
Application to be made using wetter technology – improve crop canopy and soil penetration
Application Technology
Why are Koppert involved?

- Accurate distribution for optimal crop protection
- Availability of farm workers – labour saving
- Reduce human error
- Larger farms
- Precision farming – industry benchmark
Koppert application technology

• New technologies linked to Smart Farming

• Managed by Tom Vroegog

• Mini-airbug, Airbug Rotabug

• Historically developed for soft fruit industry – now moving into field and row crops.
Release technology for UAV’s
Air assisted systems
Thank you for your attention!

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