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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)

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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

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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

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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.

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Release technology for UAV's

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Air assisted systems

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Thank you for your attention!

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