Tying it all together: Case study in chrysanthemums

Michael Brownbridge
Chrysanthemum production

Integrated use of biocontrol agents from propagation thru' finishing to shipping
1. Think PREVENTATIVE
Start to finish

Cuttings

• Assume they will arrive with thrips
• Biologicals used immediately

Finishing

• Other pests will arrive
• Early intervention
2. Propagation
Dipping before sticking

Cuttings immersed in

- Low risk biopesticides
  - Insecticidal soap
  - Horticultural oil, e.g. Suffoil®
  - BotaniGard

- Often combined with other products
3. Misting and blackout stages

**BotaniGard® (Beauveria bassiana)**
- Weekly sprays (3x)

**Nematodes (S. feltiae)**
- Drench, weekly sprench

**Predatory mites**
- *N. cucumeris*
- Broadcast weekly (3x)
4. Finishing
Pots at final spacing, canopy not touching

Predatory mites

- *N. cucumeris* mini-sachets

Nematodes

- Weekly until canopy closes

Biopesticide sprays

- BotaniGard
- Met52 EC

*There are many possible variations on this basic program*
Predatory mites - foliar

‘cucumeris’ mini sachets

- 1 per pot (~10¢/pot)
- Produce mites for ~ 4 weeks
- Do not disperse
5. Other IPM components

May be needed when:

- Pest pressures too great
- Other pests arrive
  - Aphids, leaf miner, mites
  - Early intervention essential

Need to ensure:

- Compatibility
- Impact on thrips biocontrols understood
Other pests

Leafminer, *Liriomyza trifolii*

- *Diglyphus*
- Nematodes

Two-spot spider mite

- Generalist predatory mites
Compatible insecticides
Challenge: controlling other pests without disrupting bio-program

Thrips
- DDVP broad spectrum, short residual (24-48h)
- Re-introduce predatory mites

Aphids
- (Imidacloprid drench)
- Flonicomid
- Parasitoids, predators
Summary
Biological control of thrips

System works for thrips on a commercial scale

Reasons for success:
- Straightforward to use
- Delivers
- Cost effective