Biocompatibility: Pesticides and Biocontrols

A big word for your bugs

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Overview

- No input is without consequences
- Minimizing harm to a biocontrol program has 3 key features
  - Picking your battles
  - Product selection
  - Timing

Picking Battles

- Starting a biocontrol program by target pest
- Bios for TSSM are different than bios for aphids
  - –Different critters; different pesticide susceptibility
- Don’t bite off more than you can chew

Where to Start

- What pests are yearly problems?
- Your most difficult pest to control?
- Tend not to coincide with other pests?

Thrips and Fungus Gnats

- Huge overlap in BCA and timing
  - Stratios, nematodes, Dalotia
  - Cucumeris also controls broad mites
- BCA used are compatible with sprays for WF, TSSM, aphids
- Difficult to control with sprays; BCA are easy to use

Nematodes

- Control FG and thrips
- Easy to use; safe to spray
- Needs to happen at night
- Leaves almost all spray options open for other pests

TSSM

- Tend to occur late season
  - Little overlap with aphid or FG BCA
- Pred mites have different susceptibility than insect pests
- Overlap with some WFT, broad mite and WF BCA
  - Cucumeris, Swirskii
- BCA tend to be cost-effective

Aphids

- Species ID and temperature can slow down Bio program
- Potato aphid BCA is expensive; few options for foxglove aphids
  - But are very user-friendly
- Coincide with FG; may crop up throughout year
- Calibrachoa
- Early outbreaks of green peach aphids ideal start; later outbreaks get tricky

Whitefly

- Not a guaranteed pest
  - Exception: veggies, herbs
- Need to catch it early
- BCA are delicate and slow-acting
- Pesticides also kill aphids
- Programs are easy and cheap

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The myth of "Soft on Beneficials"

- Even with no impact from active ingredients, carriers are often caustic
  - Oils, emulsifiers, surfactants…
- BCA very active (moving, grooming) and contact pesticides more readily and often than pests
- Minimizing applications, good products and proper timing are critical

Damage Control

- Residues are biggest hurdle
- Pyrethrins are biggest offenders
  - –Anything ending in “thrin”
- Sprays > drenches
- Broad spectrum > targeted
- Systemic > translaminar

The “Safe” List

- Soaps and Oils
  - –Including plant-based
- Neem products (azidarachtin)
- Mycoinsecticides
- Nematodes
- OMRI certified

OMRI™
Listed
Organic Materials Review Institute

Proceed with Caution

- Ingestion required
  - –Kontos, endeavor
- Translaminar sprays
  - –Spinosad, Avid
- IGRs
- Neonics*

Formulations

- WP, WSP: residues
- EC or E: contain oil

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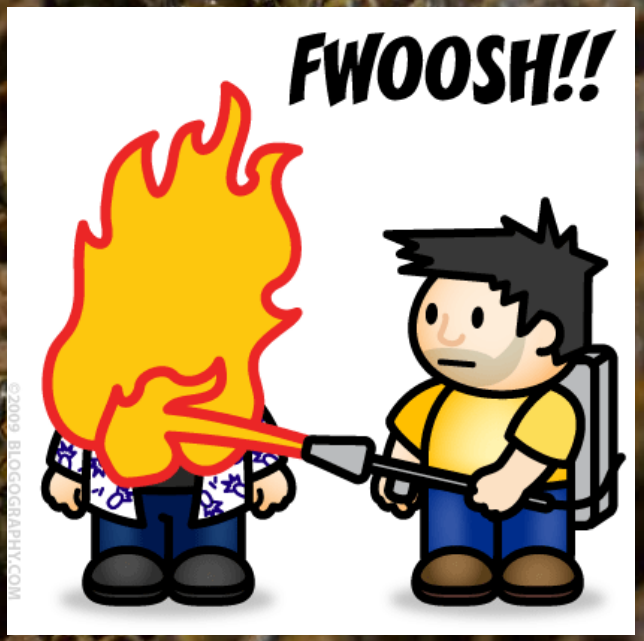
Time your sprays based on:

- Product chosen
- Past and future releases
- Pest-BCA ratio
- Other BCA present
- Time of year
- Sale time of crop

Products and Timing

- Most newer chemistries and stand-bys have “Flamethrower Mortality”
  - Based on coverage, mobility of BCA
- Assuming no residual, certain % of BCA killed with every spray



Pre-release Ideas

- Dip your cuttings and plugs!
- 0.5% mix of Soap + Botanigard
- 0.1% oil solution (not labeled)
- Add some nemas to the mix?

Pre-release sprays

- Spray away!
- BCA release rates are for early stage infestations
- Honeydew, wax and webbing impede BCA activity
  - –Syringing

Future Releases

- Certain BCA are density-dependent
  - –Ladybugs, Crypts, Stethorus

Pest-BCA Ratio

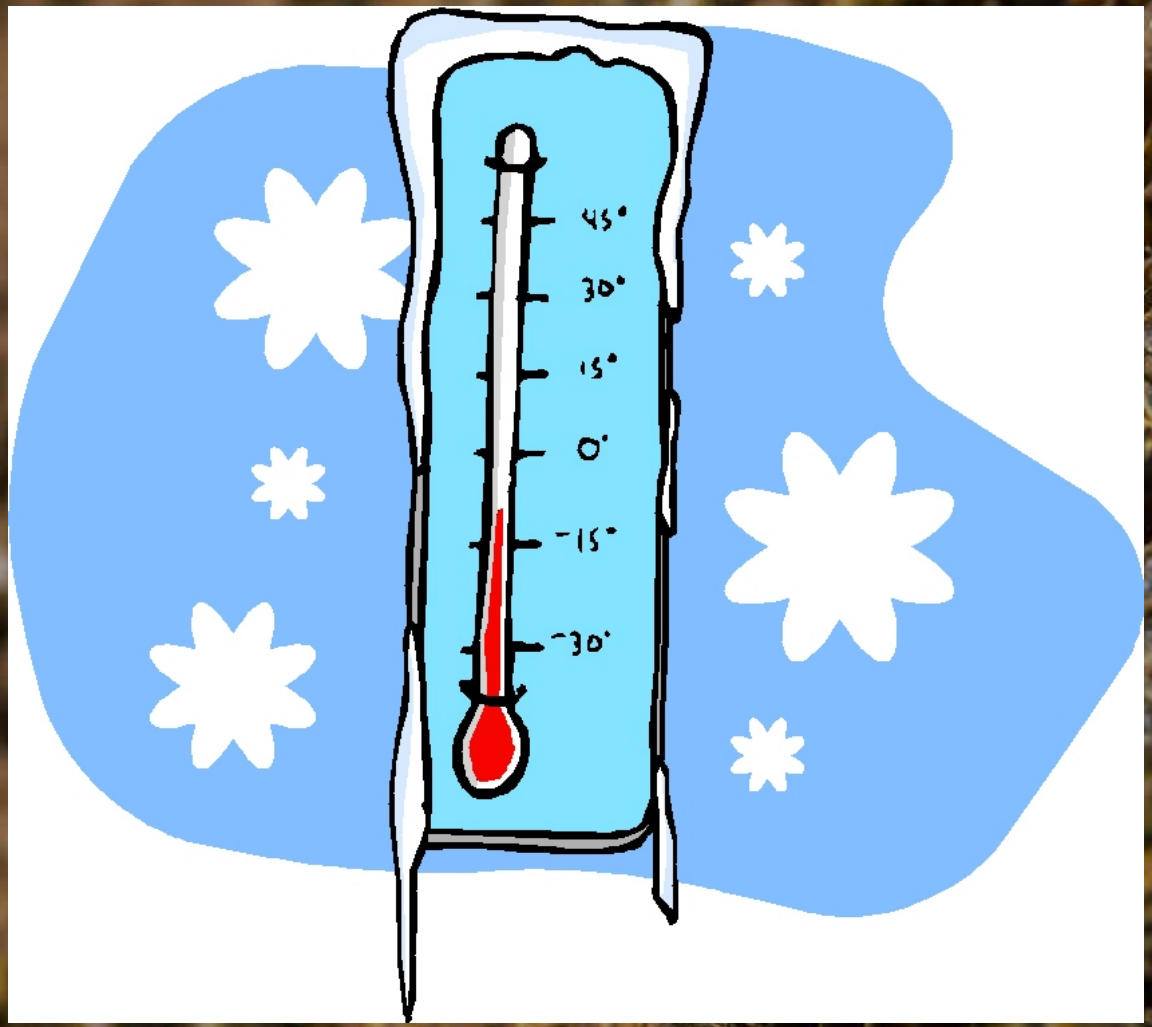
- Assess # prey vs. # BCA
- Has BCA established?
  - –Immatures, evidence of activity
- If yes, then action thresholds get tricky, depend on other factors

Ratios

- Expect cleanup if 1 in 10 aphids are mummies
- For TSSM: 1:10 is ideal, 1:20 is on the fence
- WF: 50-80% blackened scales is good


Clemson University - USDA Cooperative Extension Slide Series, , Bugwood.org
UGA1236079

Environment



Crop Sales

- Plants need to clean up fast
- Growing out of any damage
- Selecting covert BCA

Questions?

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