Managing Codling Moth with Granulovirus and Spinosad
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Cydia pomonella granulosis virus, CpGV
- Safe and selective bioinsecticide
- Larvae are infected by ingestion = slow killing speed
- Target neonate (newly hatched) larva
- Dead larvae release an oozing substance full of virus particles
- High larval mortality = reduction in population of subsequent CM generation

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Virus testing program, 2003

Small plot field trials
- Replicated (5) single-tree plots – handgun applications
- Carpovirusine and Virosoft applied every 10 days,
- Cyd-X applied every 14 days
- Injury evaluated at the end of each CM generation
- Larvae from virus treated trees collected in cardboard bands to monitor moth emergence

Laboratory evaluations
- Leaf-Dip dose response bioassays for virus products
- Field-aged residue bioassays for virus products

Leaf-dip Dose Response Bioassays

Field-aged Residue Bioassays

Small-plot handgun trial, 2003
Leaves collected at regular intervals from sprayed trees

Collect leaves at regular intervals from sprayed trees
Remove treated disks from dish after 24 hours and replace with untreated diet – record mortality at 7 DAT

Carpovirusine 1.0 x 10^13 70.6b 56.3b 50.0b 33.3a
Cyd-X 1.0 x 10^13 58.8b 43.8b 71.4b 22.2a
Virosoft 1.0 x 10^13 58.8b 62.5a 28.6ab 11.1a

Means followed by the same letter are not significantly different.

Organically registered spinosad, Entrust
- Nervous system toxicant
- Active against neonate larva
- Must be ingested by CM larva before entering fruit

Small-plot field trial
- Entrust (organic) compared to Success and Guthion in the reduction of CM entries per fruit
- No statistical difference between products in field or laboratory tests
- No product provides a reduction in percent fruit injury relative to the untreated check under high pressure
- All products provide a reduction in the number of entries per fruit relative to the untreated check
- Large proportion of fruit injury composed of ‘stings’ indicating that larvae die after injuring fruit
- Low moth emergence demonstrates a high level of delayed larval mortality which would result in a reduction of the subsequent CM generation
- LC50 and the toxicity value suggest that all virus products are highly toxic to CM larvae at the recommended use concentrations
- Field-aged residue studies show significant larval mortality for at least seven days with all virus products

Granulosis Virus
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Entrust
- Recommended use concentrations
- Insecticide (OB/1000L) 1 DAT 3 DAT 7 DAT 14 DAT
- Leaves collected at 1, 3, 7 and 14 days after treatment
- Mortality recorded 7 days after exposure

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate (OB/1000L)</th>
<th>Avg corr. % mort-CM (%D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpovirusine</td>
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Safe and selective bioinsecticide

Field-aged residue bioassays for virus products

Leaf-Dip dose response bioassays for virus products