# Larvacides for CM/OFM:


Larvae

**Larvacides (most common - apply @ start of egg hatch)**

- ✓OP's, pyrethroids, Altacor®, Belt®, Delegate®
- ✓Neo-nicotinoids - Assail®, Calypso®, Clutch®
- ✓Intrepid® (some injury does occur, affects next generation)
- ✓Granulosis virus (Cyd-X®, Carpovirusine®) - limited fruit protection initially (i.e., "stings" occur), greatest effects occur in next generation

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# WHAT & WHEN of Internal Worm Control

## If using insecticides and/or MD for control - consider the following:

- Choice of products - efficacy and $$
- Rate of the products
- Optimum timing of the products
- Method of application
- Water volume and coverage
- Rotate insecticide chemistries between broods where possible
- Pheromone mating disruption

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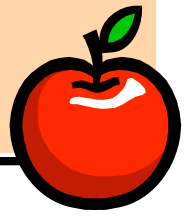
# Relative Efficacy of Older Insecticides in PA

| Common Name | Codling Moth | Oriental Fruit Moth | Leaf-rollers | Apple Maggot | Plum Curculio | |
|---|---|---|---|---|---|---|
| Guthion | E | E | F-E | E | E | Res. |
| Imidan | G-E | G-E | F-G | G | E | Res. |
| Sevin | F | F-G | P | F | P-F | |
| Lorsban | — | E | E | — | — | |
| Pyrethroids | G | G-E | G-E | G | F | |
| Calypso | G-E | E | F | G | G | |
| Assail | G-E | E | F | G | G | |
| Intrepid | G-E | G-E | E | P | P | |
| Rimon | E | E | E | P | P | |
| Proclaim | G | G | E | P | P | |
| Esteem | G | G | G-E | P | P | |
| SpinTor | F | F | G-E | G | P | |



E=Excellent, G=Good, F=Fair, P=Poor

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# Understanding OFM/CM Larval Behavior and Spray Coverage


Egg

Larva

Injured shoot

(OFM only)

Within 1 to 24 hours of hatch, the larva will enter a shoot or fruit


Injured fruit (CM / OFM)

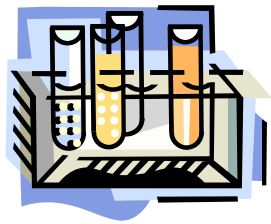
**Key to control:** The egg or the larva must contact the insecticide either via contact or ingestion before entry. Once inside, the larva cannot be killed unless it exits the shoot/fruit.

LAH-2003

# New Insecticides - Internal Worm Control

- ✓**Altacor™** (Rynaxypyr, also DPX-E2Y)
  DuPont Co.

- ✓**Belt™** (Flubendiamide, also NNI-0001)
  Bayer CropScience



- ✓**Delegate™** (Spinetoram), also XDE-175)
  Dow AgroSciences

- ✓ **Voliam flexi™** (Chlorantraniliprole + Thiamethoxam)
  Syngenta

# DELEGATE™ WG

## Crops and pre-harvest intervals (PHI):

Pome fruit (7d PHI); bushberries (3d PHI); caneberries (1d PHI); tree nuts (14 d PHI), grape (7d PHI); stone fruit (1d PHI on nectarines, 7d PHI on cherries, plums and prunes, 14 d PHI on peaches).

## Pests (control):

Codling moth, oriental fruit moth, obliquebanded leafroller, tufted apple bud moth, thrips, leafminers, grape berry moth, cherry fruitworm, loopers, pear psylla

## Pests (suppression):

Apple maggot, plum curculio, blueberry maggot, currant fruit fly

## Recommended rate(s):

From 4.5 to 7 oz per acre depending on pest and pest pressure.

- **REI requirements: 4 hours**

# Altacor™


## Mode of Action and Symptomology

- Ryanodine receptor agonist
- Regulates release of stored calcium
- Primary route of exposure is through ingestion
- IRAC Group 28 Insecticide


Crops - Apple, Pear, Stonefruits, Grapes
Targeted Pests (apple/peach) -- codling moth, OFM, leafrollers, STLM

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# Belt™

## Targeted Insect Pests in Fruit (Apple/Pear)

- Codling moth
- Obliquebanded leaf roller
- Tufted apple bud moth
- Green fruitworm
- Spotted tentiform leafminer

- 3-5 oz/acre
- 3 applic/season
- 15.0 oz/acre for the season
- 14 day PHI

L. A. Hull 2008 Also - G. Krawczyk

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