

What's New in Codling Moth Control



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Farm Advisor

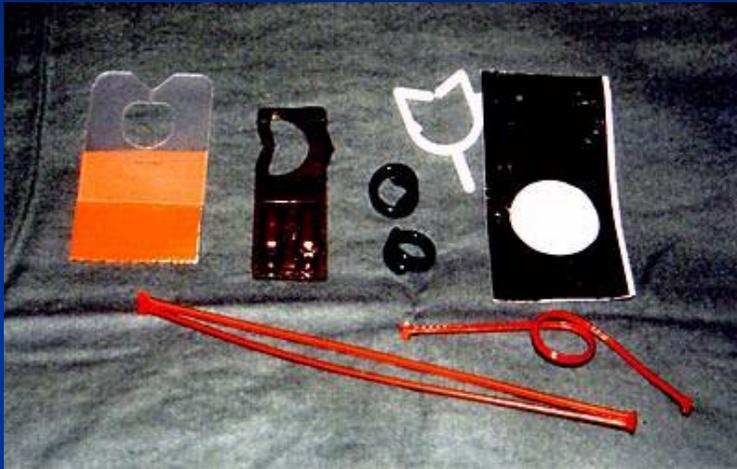
UC Cooperative Extension

Contra Costa Co



Apple Institute - March 21, 2006

Codling Moth Control Tool box



Pheromones



Biological Control



Sprays

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Sprays



Traditional Materials

Organophosphates

Guthion

Imidan

Carbamates

Sevin

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Sprays



Traditional Materials

Issues

- Environmental concerns
- Safety concerns
- Hard on beneficials --> secondary pest outbreaks
- Resistance

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New Types of Materials

Chloronicotinyls

Insect Growth Regulators

Unique modes of action

- Reduced risk
 - Environment
 - Less toxic to people
- Narrower spectrum
- Softer on beneficials

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New Materials

Chloronicotinyls

- Contact materials
- Some have CM efficacy
 - Assail
 - Calypso
 - Clutch



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Chloronicotinyls

Assail

- CA Reg 2003
- Similar to Imidan (~75% CM control)
- Category IV: Caution
- REI: 12 hours
- PHI: 7 days
- Apply at 250 DD + 14 days
- Toxic to CM eggs & larva
- Also LH, GAA, (RAA, WAA); not LR
- Watch for mites

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Chloronicotinyls

Calypso

- CA Reg 9/05
- Similar to Assail for CM (~70% CM control)
- Category II: Warning
- REI: 12 hours
- PHI: 30 days
- Apply at 250 DD + 14 days
- Toxic to CM eggs & larva
- Also for RAA, GAA, (LH); not WAA, LR

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Chloronicotinyls

Clutch

- CA Reg April 2005
- Modest CM control (~50%)
- Very little field testing
- Category IV: Caution
- REI: 12 hours
- PHI: 7 days
- Labeled for aphid, LH, LM

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New Materials

Insect Growth Regulators

- No contact activity
- Must be eaten
- Interfere with insect development
- May not kill immediately
- Usually stop feeding quickly
 - **Intrepid**
 - **Esteem**

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Insect Growth Regulators

Intrepid

- CA Reg: May 2003
- For lower pressure CM sites (~65% CM control)
- Category IV: Caution
- REI: 4 hours; PHI: 14 days
- Prevents molting
- Toxic to eggs laid before/after
- Apply at 75-250 DD
- Also: LR

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Insect Growth Regulators

Esteem/Sieze

- CA Reg: 2002
- CM suppression (~40% CM control)
- Shorter residual than Intrepid
- Category IV: Caution
- REI: 12 hours; PHI: 45 days
- Toxic to eggs laid after
- Apply at 75-100 DD
- Also: SJS and LR, (RAA?)

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Other RR Insecticides

- Success/Entrust
- Oil
- Surround
- Granulosis

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Other RR Insecticides

Success/Entrust (organic)

- Fermented from a fungus
- For low CM pressure sites
- 1% oil increases efficacy
- Reapplication: 10-14 days
- Not a contact – must eat
- Category IV: Caution
- REI: 4 hours; PHI: 7 day
- 3 application limit/year
- Also for LR, LM, thrips

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Other RR Insecticides

Summer Oil

- Suffocates eggs, no residual
- 0.25%-1%
- CM suppression (~45% CM control)
- Apply every 150-200 DD
- Organic option
- Impacts on fruit finish, vigor?, sunburn? w/season long use
- Phytotoxic with sulfur
- Also for mite, LH suppression

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Other RR Insecticides

CM Granulosis virus

- CydX, Carposvirosine, Virosoft
- CA Reg: pending for 2006!
- For lower pressure CM sites
- Short residual – use lower rate, reapply frequently (7-10 days)
- Organic option
- Alternate w/ Entrust
- Use to supplement MD
- Reduces the next generation

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Sprays



Other RR Insecticides

Surround

- Particle film: kaolin clay
- CM suppression (~55% control – 3 sprays/gen)
- Not toxic - barrier
- Impacts on beneficials?
- Organic option
- Drift very obvious
- Residue on fruit
- Corrosive to nozzles
- Expensive - season long

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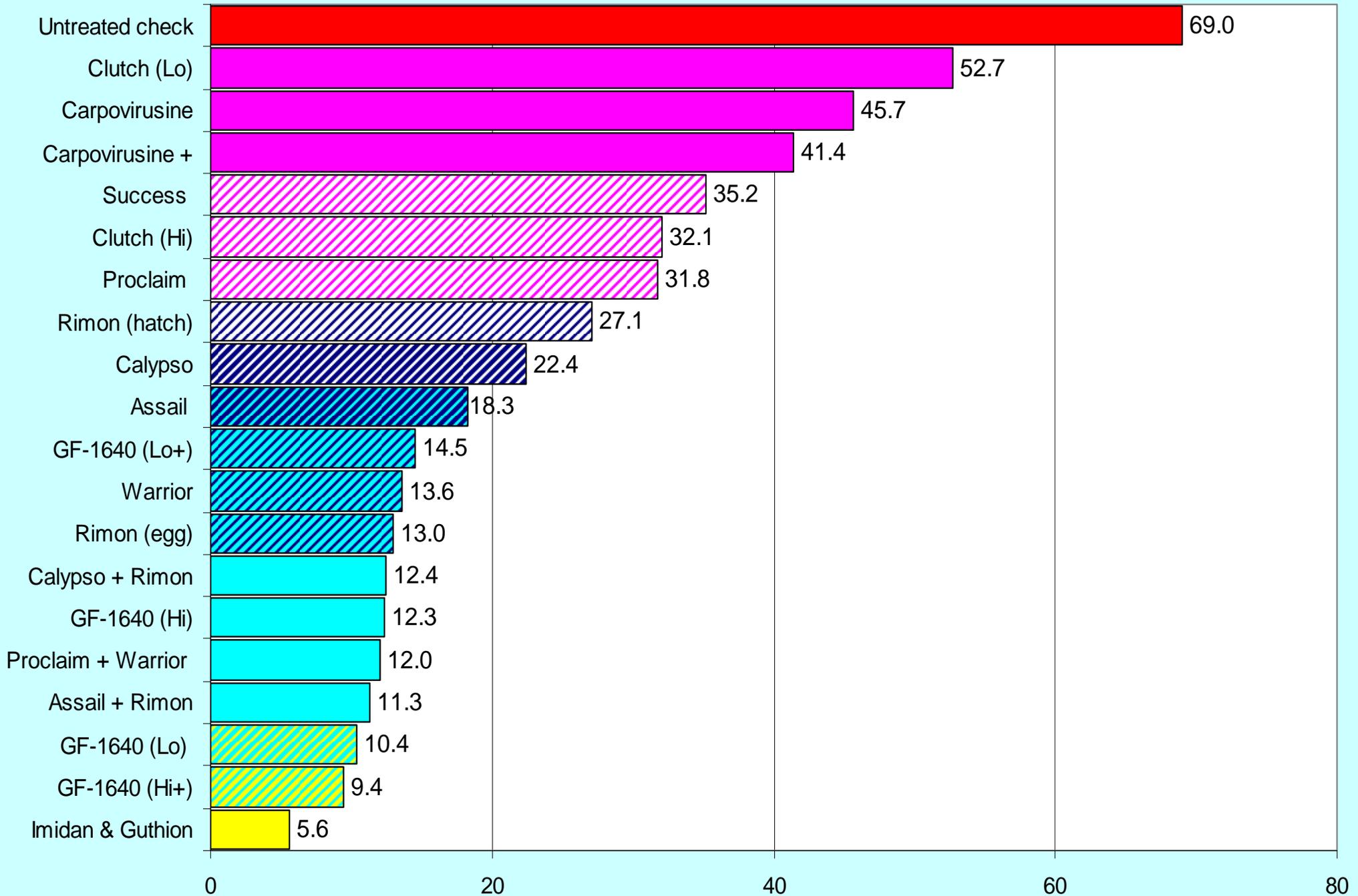
Sprays



Future RR Sprays

- **Warrior** (pyrethroid)
 - Good contact, short residual
- **Proclaim** (glycoside [Agri-mek])
 - Very toxic to young CM
 - Delayed kill (fruit damage)
 - Longer residual
- **GF-1640**
 - Control similar to Guthion!
 - Not registered yet

GALA: % Codling Moth Damage - Harvest



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Sprays

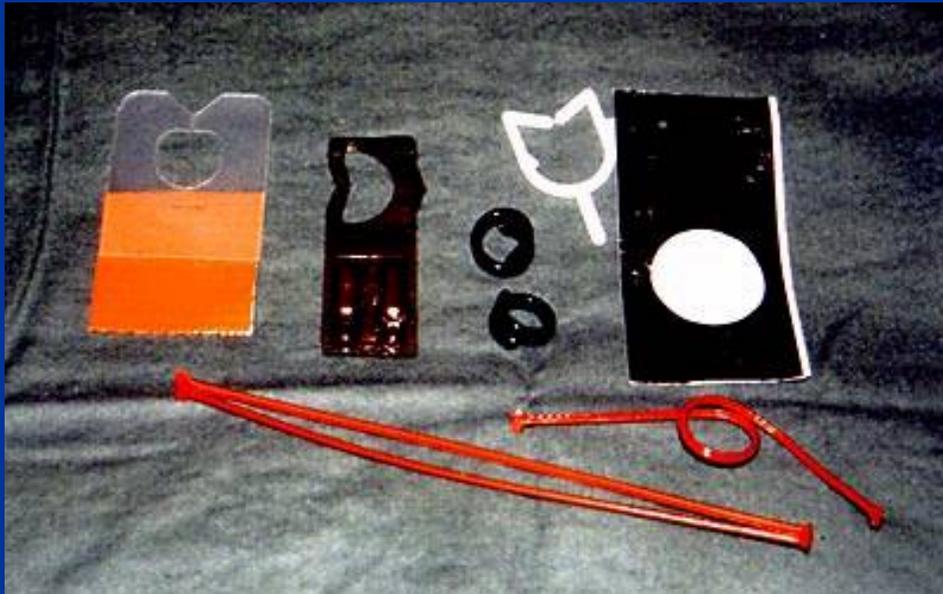


Other RR Sprays

Sprayable Pheromones

- 3M Micro Encapsulated sprayable pheromone disrupts mating
- Not photo stable – very short residual
- Not recommended for apples

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Pheromone Products

MATING DISRUPTION

- Isomate (200/A, 400/A)
- Checkmate CM (200/A)
- No Mate spiral (400/A)
- Disrupt CM (200/A)
- Sutterra puffers (1/A)

ATTRACT & KILL

- Last Call (1200/A)

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New Pheromone Products

MATING DISRUPTION

Cide-trak CM (Trece)

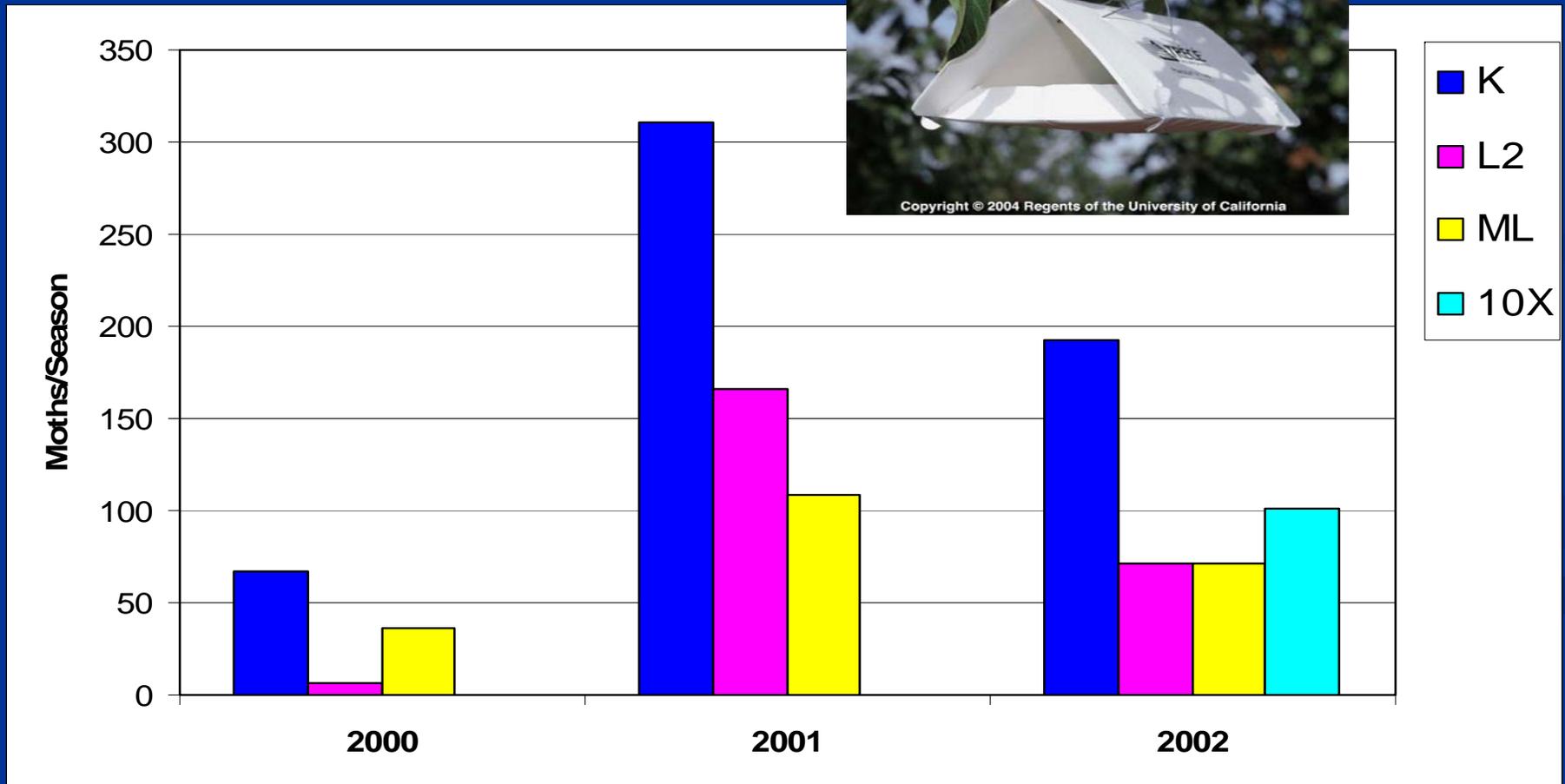
- Pheromone & pear ester
- Field trials promising
- May enhance disruption
- Available in 2007?



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New Monitoring Products for MATING DISRUPTION

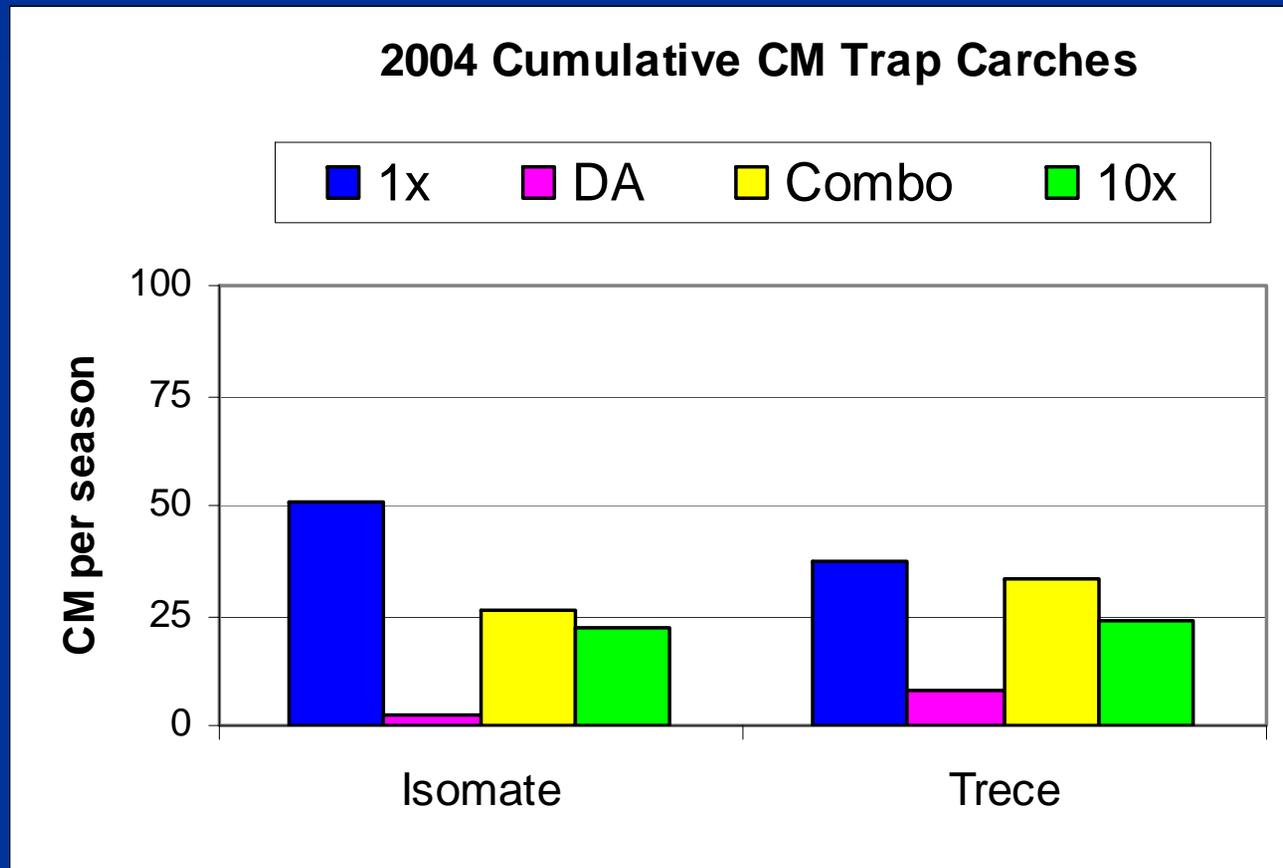
- DA lure (pear ester)



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New Monitoring Products for MATING DISRUPTION

- Combo lure (pear ester + pheromone)



Bio-control Tool box



Mastrus ridibundus



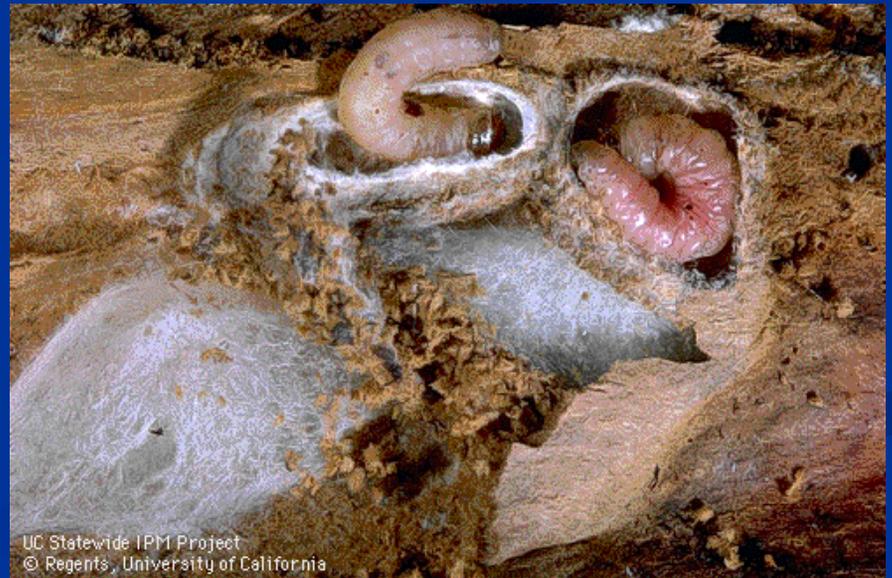
Trichogramma platneri



Granulosis virus

Mastrus ridibundus

- Larval parasitoid
- Attacks the over wintering generation in soil, bark crevices
- Releases from 1998-2003
- Reduces CM populations for 1-2 years in walnuts
- Apples: use as a supplement to organic program
- NOT AVAILABLE AT INSECTORIES



Trichogramma platneri

- Native to the Western US

- An egg parasite

- Augmentive releases



Trichogramma platneri

Effectiveness:

- 10-60% damage reduction
- Pears & walnuts > apples
- Handling issues
 - Predation
 - Water & sun exposure
 - Hatch timing
 - Application timing
 - Distribution uniformity
- Best as a supplemental method



Trichogramma platneri

Aerial Application

- For larger acreages
- Less predation
- Better distribution
- Handling issues
- Specialized equipment



