

2008

Research Update Meeting 2008 - Cranberry Insecticide Screening

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Cranberry Insecticide Screening

**Fruitworm and
Flea Beetle Trials**



**New Compounds
Update**



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Marty Outline

1. Update on Insecticides
2. Cranberry Fruitworm
3. Cranberry Flea Beetle

Anne Outline

1. Insecticide screening - Tipworm
2. Pollination
3. Colony Collapse Update
4. Fruitworm Preventative Tactics

1988

- Diazinon
- ~~Guthion~~
- Lorsban
- ~~Malathion~~
- Orthene
- ~~Parathion~~
- Sevin
- ~~Omite~~

2000

- BT products
- Confirm
- Nematodes
- Pyrenone
- Sprayable pheromones
- Diazinon
- ~~Guthion~~
- Lorsban
- Orthene
- Sevin

2008

- Actara
- Admire
- Avaunt
- Spintor
- Diazinon
- Lorsban
- Orthene
- Imidan
- Sevin
- BT products
- Confirm
- **Intrepid**
- Nematodes
- Pyrenone
- Nexter (Pyramite)
- + New Spin
- + New Neo

- Full Labels -- Section 3

- Avaunt (indoxacarb) **2007**
- Actara (thiamethoxam) **2005**
- Intrepid (methoxyfenozone) **2004**
- Admire (imidacloprid) **2004**
- Spintor (spinosad) **2002**
- Pyramite, Nexter (pyridaben) **2001**

- Promising options for 2008

- New Spinosad compound
- New Neonicotinoid compound (Neo B)

Nearly labeled for 2008

New Spinosad compound

- Cranberry tolerance thru EPA
- Federal label with Cranberry on it
- Pending State Registration

Reduced Risk
Environmentally clean
No Zone II issues

New Neonicotinoid compound

- Cranberry tolerance thru EPA
- Federal label with Cranberry on it
- developing label, Pending State Registration

EPA reviewed
under small
berry grouping

NEO B

Neonicotinoids

- Already labelled
- NEO A
 - More active than Actara
 - IR4 Cranberry residues done in 2005
 - Submitted to EPA in 2008
- NEO B
 - tolerance on cranberry granted last week
 - First tolerance granted through berry grouping
 - Nisso and UPI developing label
- NEO C widely used neonicotinoid
 - IR4 residue scheduled for 2008
- NEO D widely used neonicotinoid

Neurotoxins

- Actara (thiamethoxam)
- Admire (imidacloprid)

*Flea Beetle
Cranberry Weevil*

*Flea Beetle
CFW*

What Else for Insecticides?

Numbered Compounds , Reduced Risk

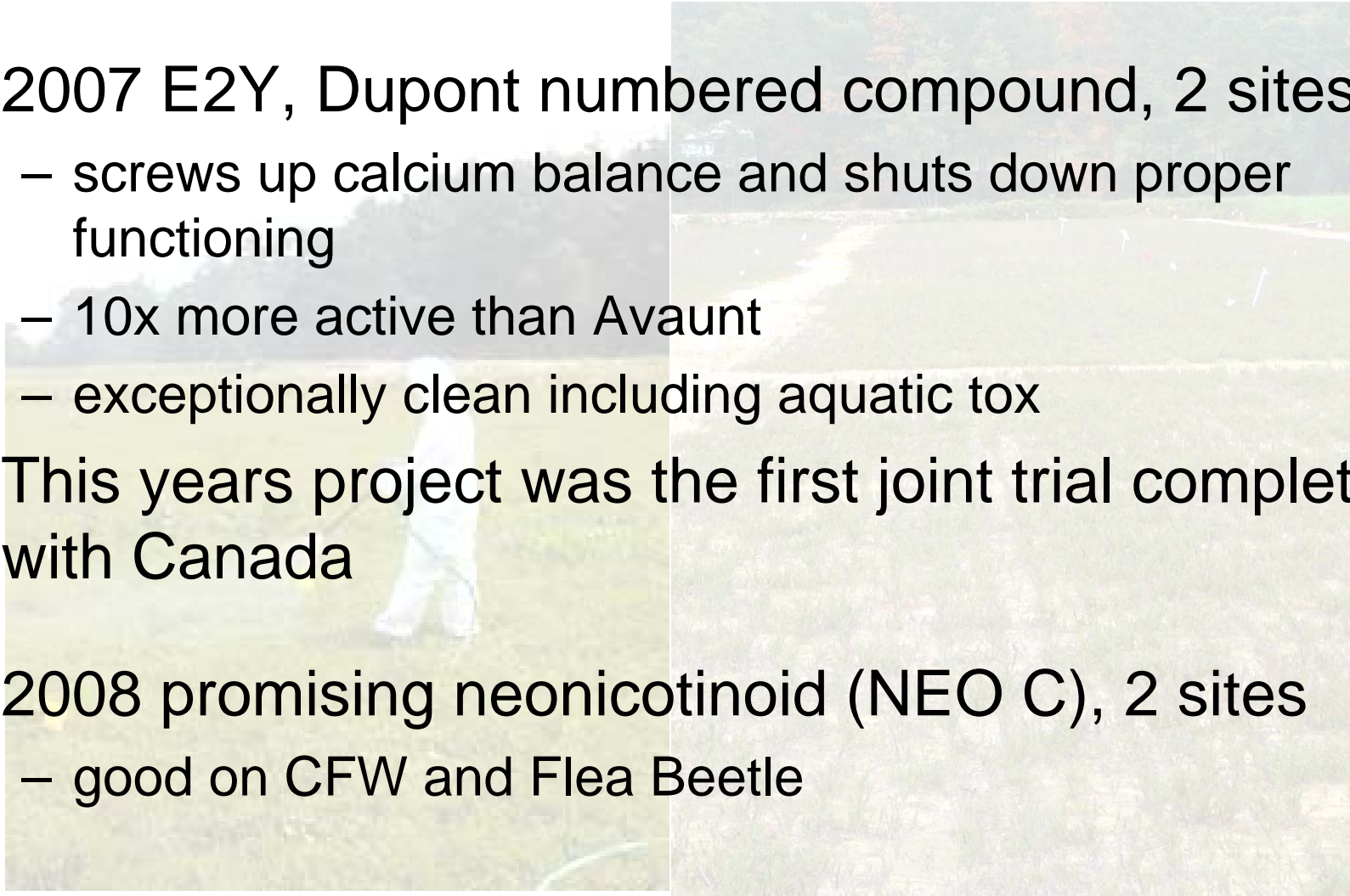
- Different chemistries, have to be ingested
- RR 1A—E2Y Dupont moving it forward
 - IR4 residue done in 2007
 - Calcium channel blockers
- RR 1B—NNI, same mode of action as RR1A, Bayer
- RR 2—HGW Dupont stalling development
- RR 3—BAS320, BASF
 - same mode of action as Avaunt
 - sodium channel blockers
 - not as promising , dropped this year

Field Trials on hold except...



IR-4 insecticide residue study

- 2007 E2Y, Dupont numbered compound, 2 sites
 - screws up calcium balance and shuts down proper functioning
 - 10x more active than Avaunt
 - exceptionally clean including aquatic tox
- This years project was the first joint trial completed with Canada
- 2008 promising neonicotinoid (NEO C), 2 sites
 - good on CFW and Flea Beetle



2. Cranberry Fruitworm

- Still # 1 pest in cranberry
- 2-4 organophosphate sprays timed for peak egg hatch

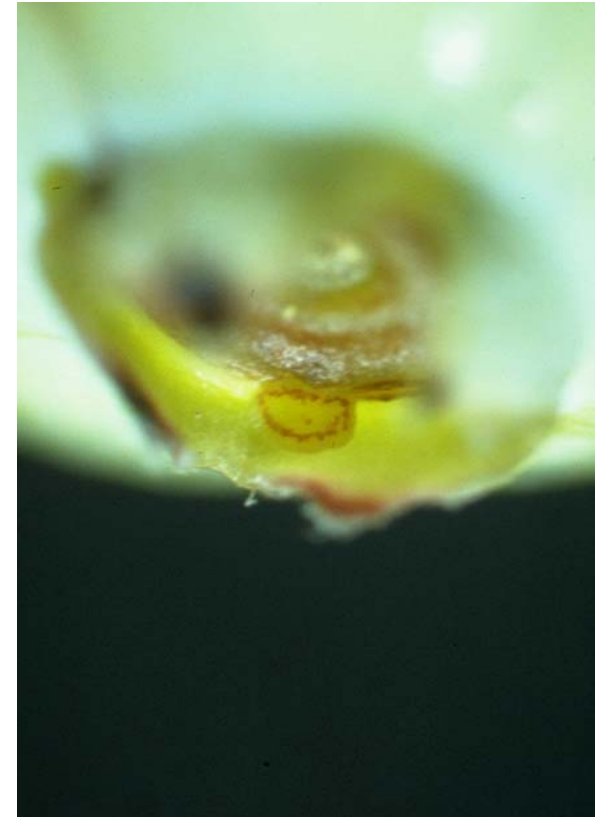


LAB TRIALS

- New compounds
 - Chemigation is the wild card
 - New options if New Spin and Neo B clear state

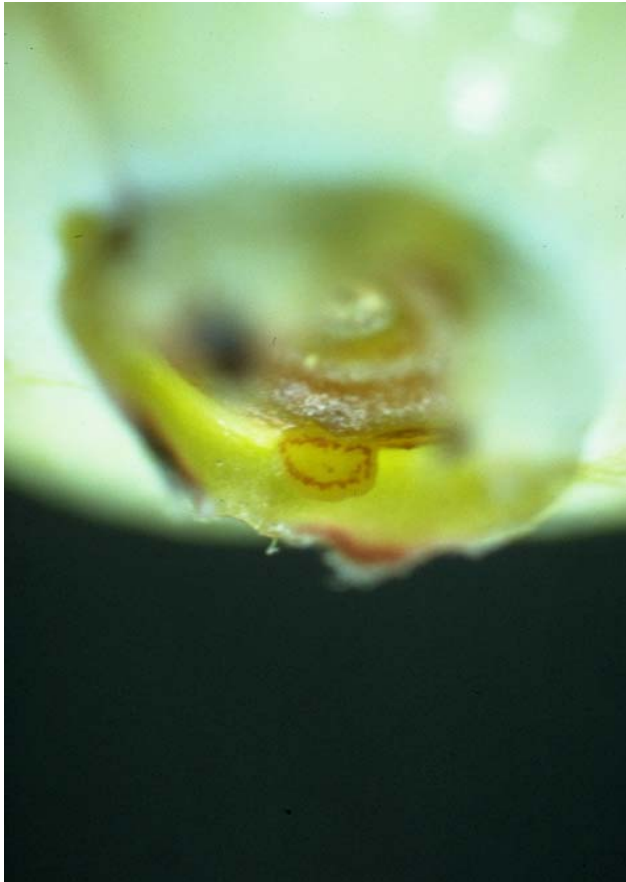
Cranberry Fruitworm

- Egg mortality
 - Kill eggs before they hatch or as they hatch
 - Ovicidal activity
- Larval mortality
 - Kill larvae as they travel from calyx to pedicel
 - Or kill larvae as they burrow into fruit



Cranberry Fruitworm

Egg mortality



•Diazinon	87%
•Neo A	86%
•New Spin	70%
•Neo C	62%
•Neo D	58%
•Neo B	57%
•Sevin	44%
•Avaunt	29%
•Intrepid	17%
•E2Y	13%
•Control	12%
•NNI	11%

Larval mortality



Treatment (total larvae) % dead

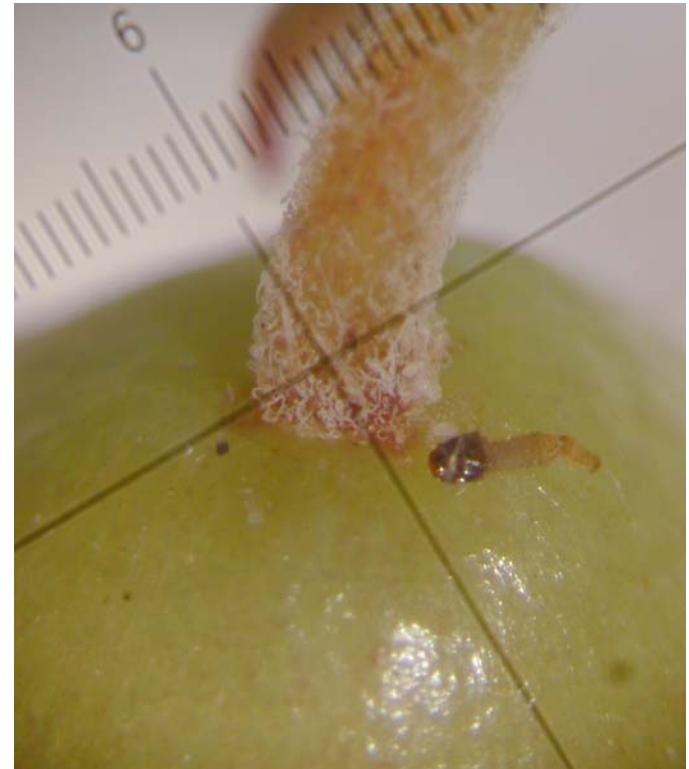
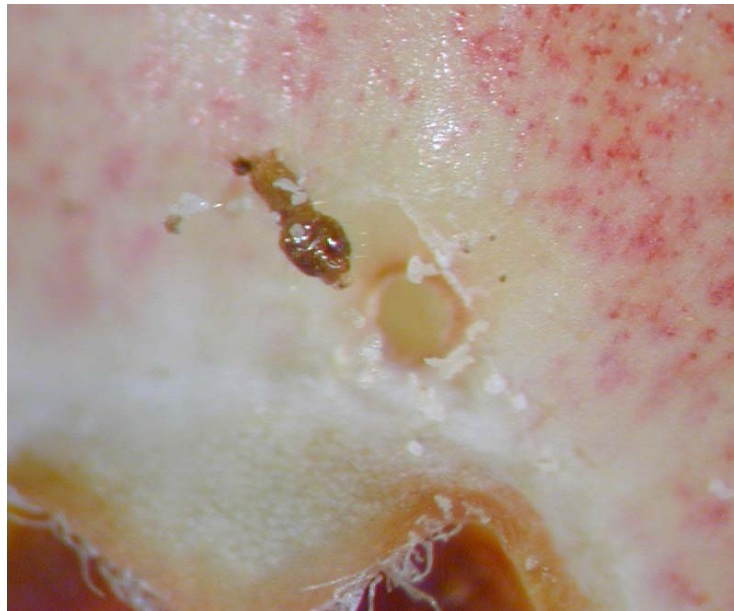
- Neo A (0)
- Neo B (60) 100%
- Neo C (47) 98%
- Sevin (24) 96%
- NNI (59) 93%
- Intrepid (78) 92%
- E2Y (51) 90%
- Neo D (18) 89%
- New Spin (34) 88%
- Diazinon* (10) 80%
- Avaunt (28) 71%
- Control (201) 14%

Where is the dead larva found??

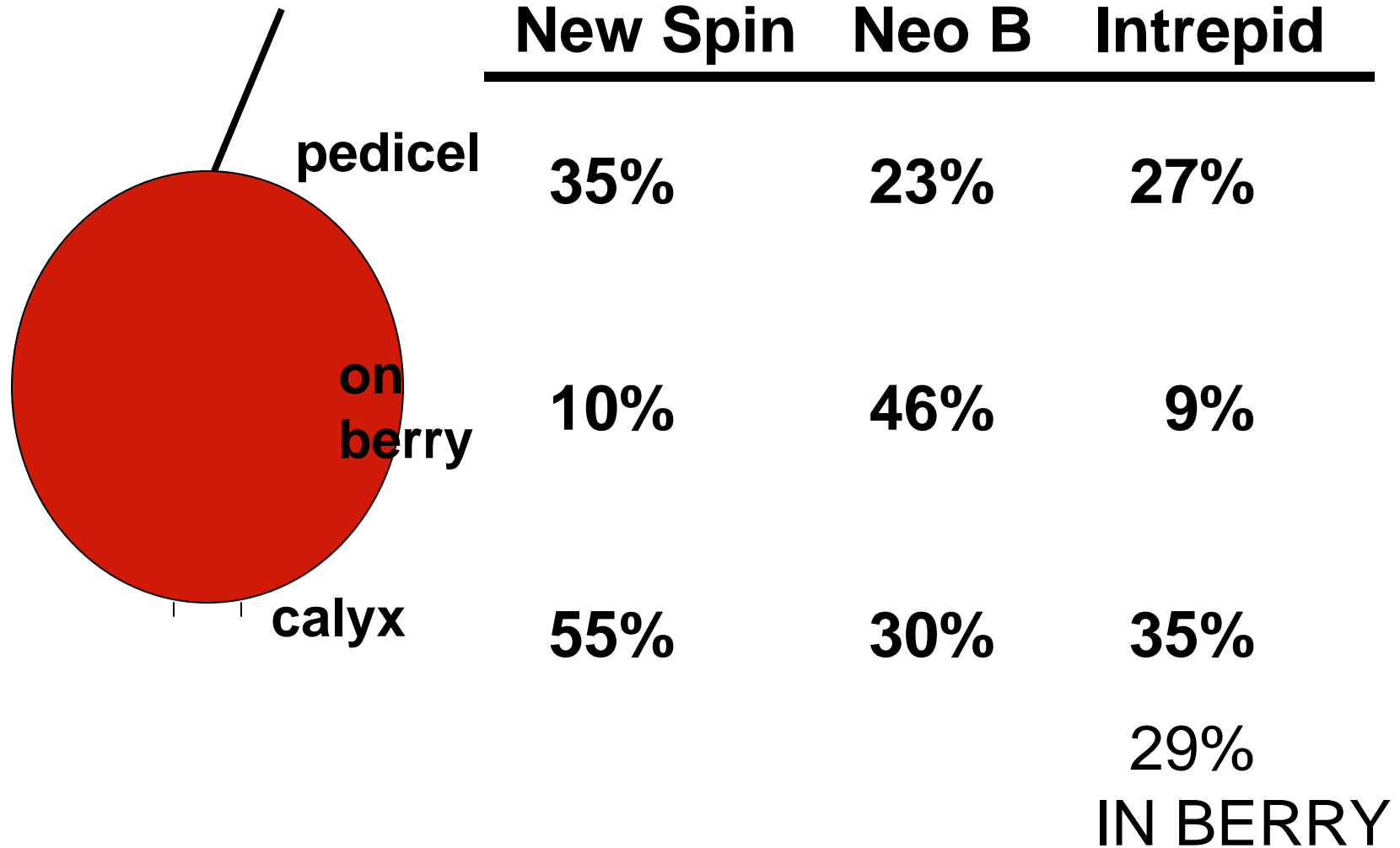
Pedicel

Berry

Calyx



Where is the dead larva found??



Is there a Hole in berry??

NO

- Diazinon
- Sevin
- Neo A
- Neo B
- New Spin
- Neo C
- Neo D

YES

- Intrepid
- Avaunt
- NNI
- E2Y



Holes/Total Eggs

Diazinon	0
Neo A	0
Neo B	0
Sevin	1%
New Spin	2%
Neo C	2%
Neo D	3%
NNI	5%
E2Y	14%
Avaunt	14%
Intrepid	25%
Control	73%

Fruitworm Bottom Line

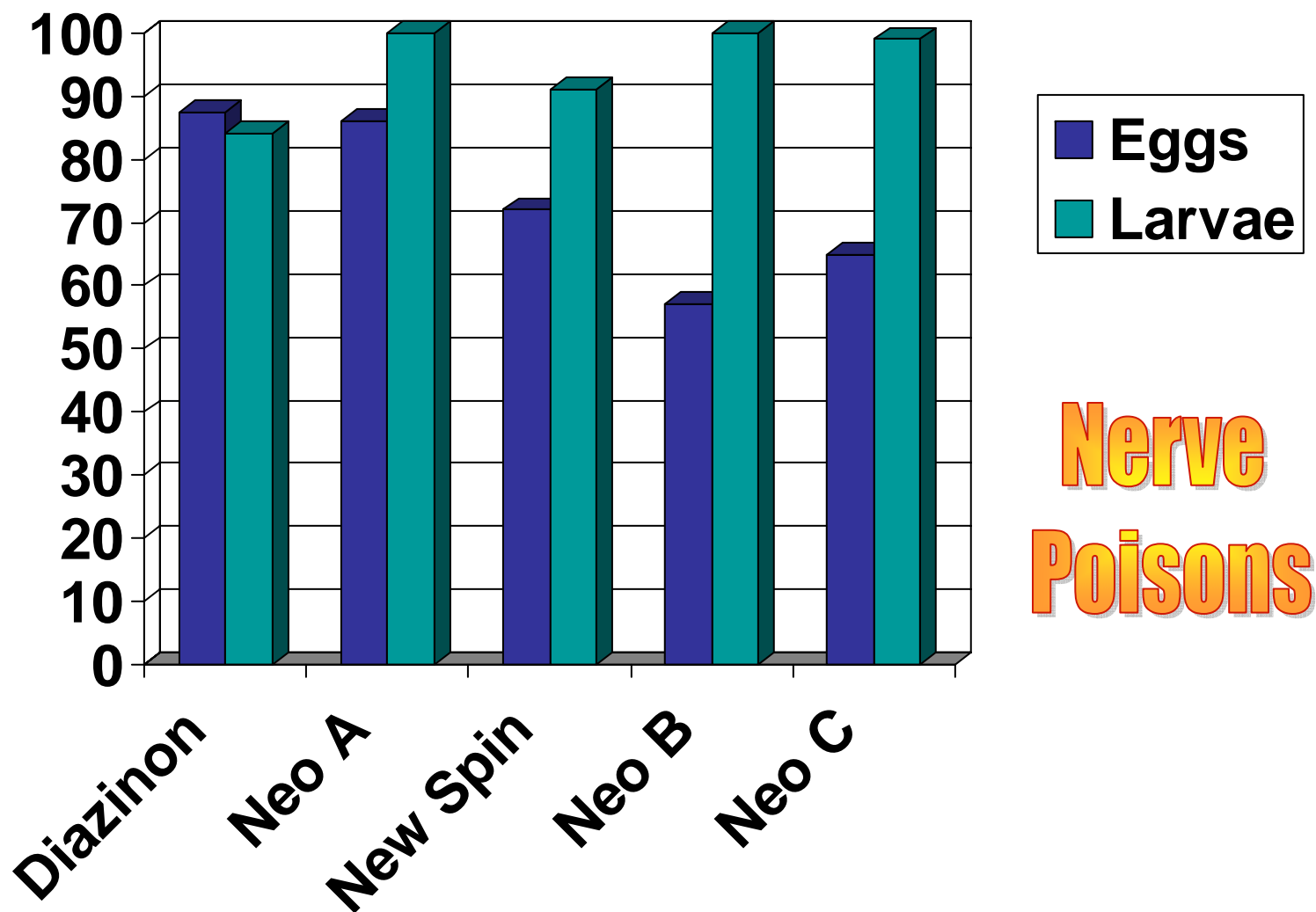
Best for killing eggs

- Diazinon
- Neo A
- New Spin

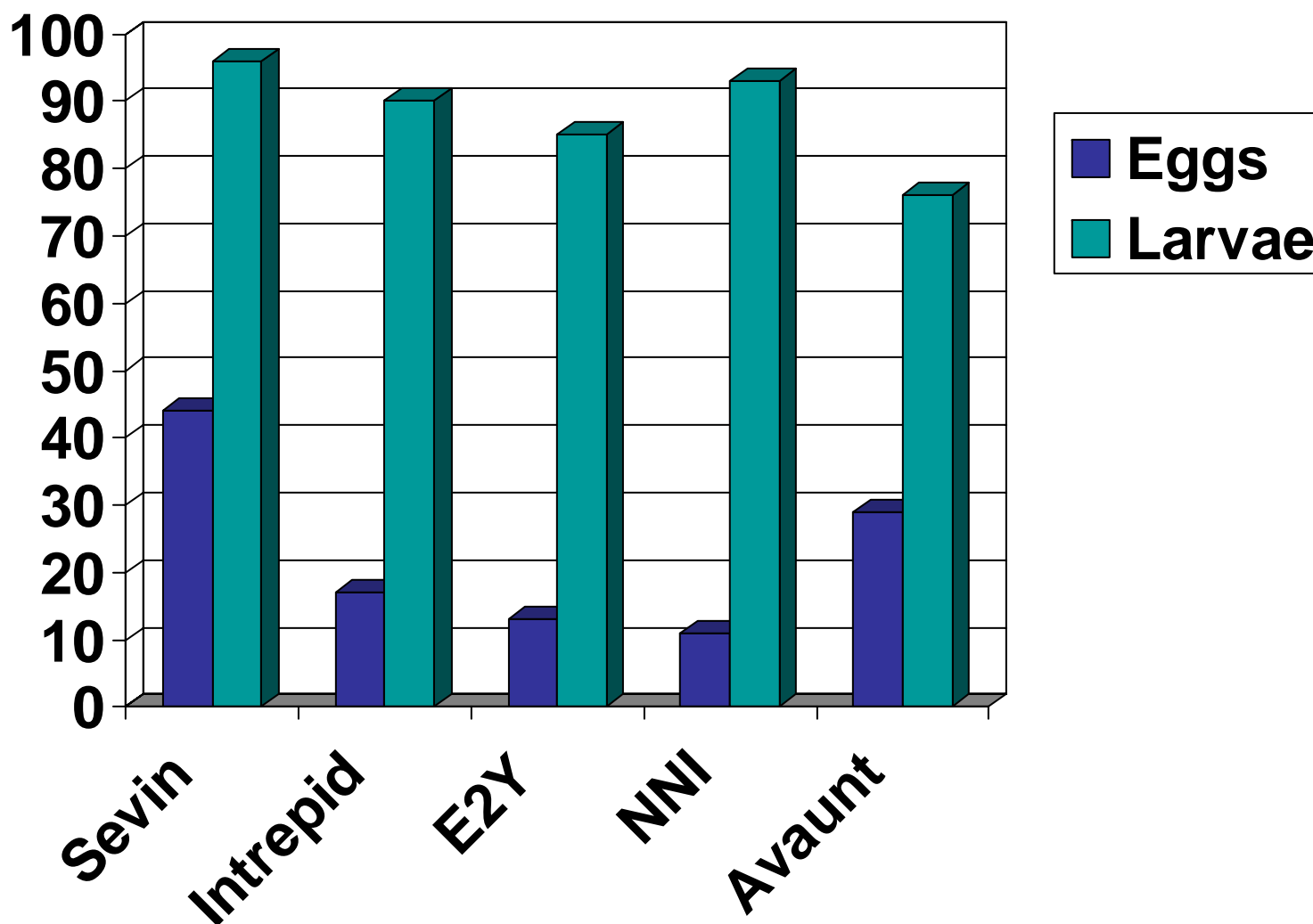
Best for killing larva

- Neo B
- Neo C
- Sevin

% Mortality of Cranberry Fruitworm



% Mortality of Cranberry Fruitworm



3. Cranberry Flea Beetle

- Increased number of reports
- Starting earlier
- Lasting longer
- Reappearing faster
- Diazinon failure?



Red-headed flea beetle

Lab trials

- Eleven compounds evaluated
- Four registered compounds
 - Diaz, Sevin, Act and Avaunt
- Four Neonicotinoids
(including Actara)
- Two numbered compounds
- New Spinosad



Red-headed flea beetle Lab Trials

- Diazinon
- Sevin
- Avaunt
- Actara
- Neo A
- Neo B
- Neo C
- Neo D
- NNI
- E2Y
- New Spin



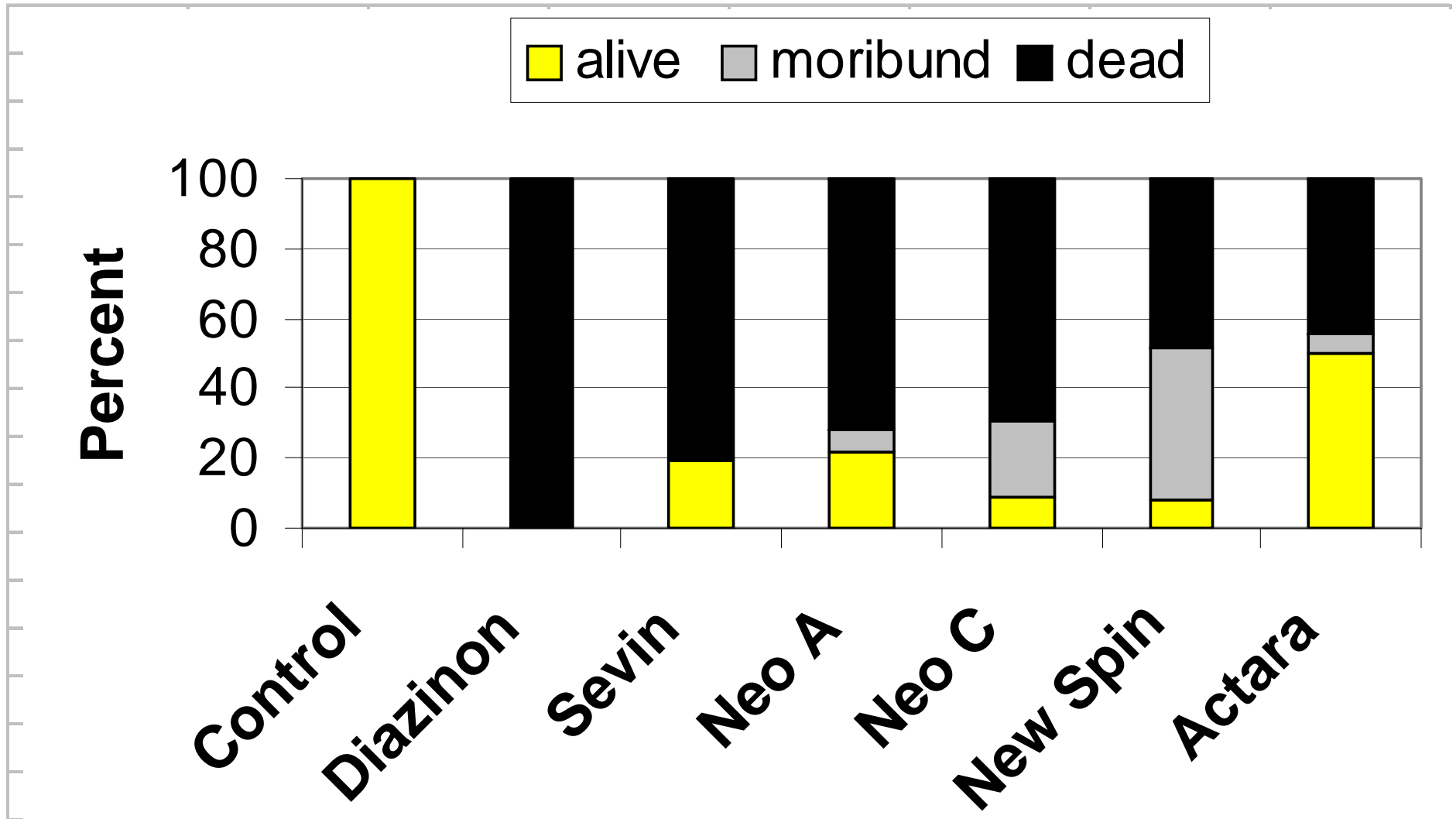
GOOD

- Diaz and Sevin
- Neonicotinoids
- New Spinosad

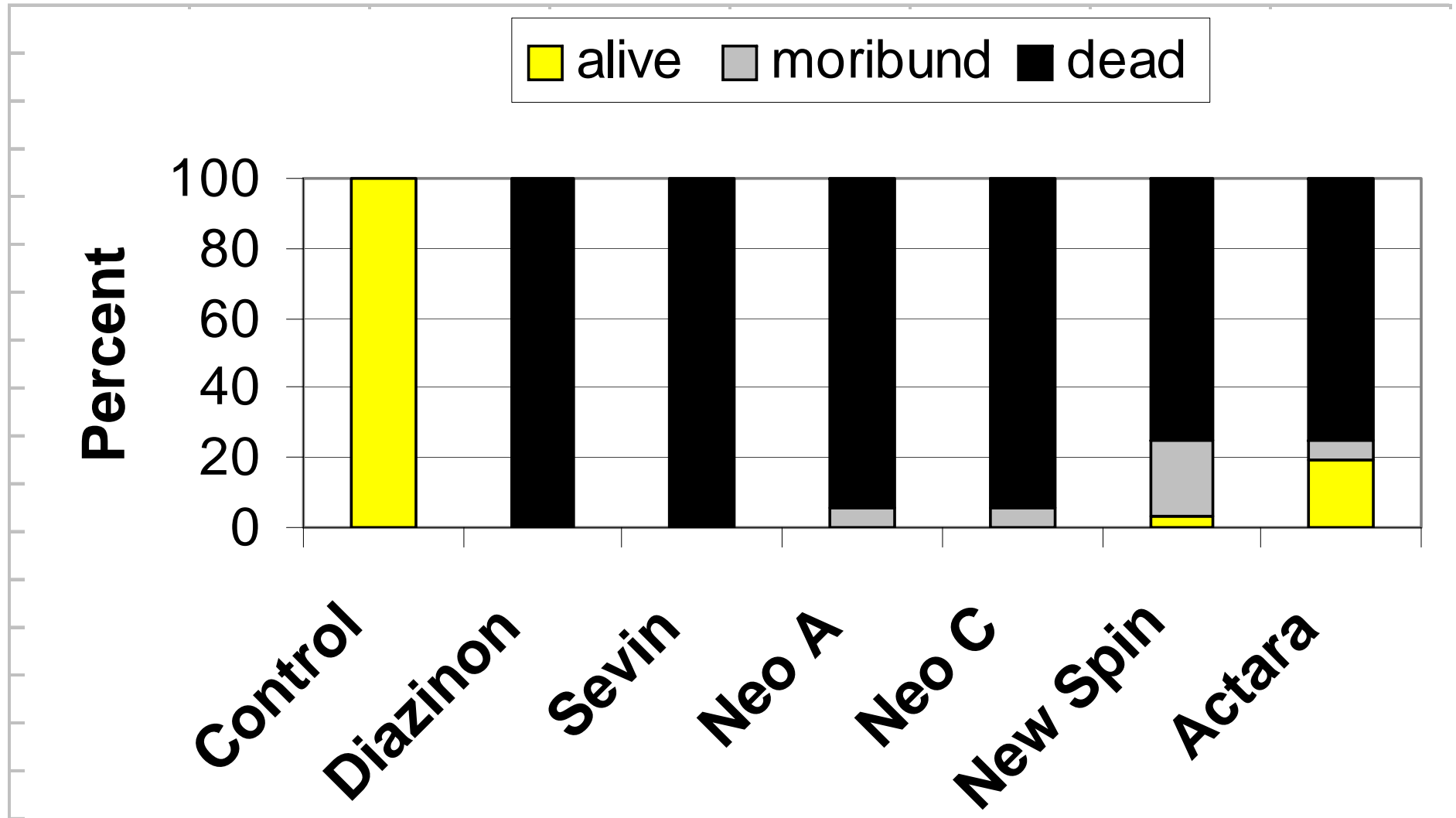
NOT SO GOOD

- Avaunt
- Numbered Compounds

Lab trial: Flea beetle at 24 hours



Lab trial: Flea beetle at 48 hours



Chemigation will be the test



New Spinosad	2008
Neo B	2008
Neo A	2009
E2Y	2010
Neo C	2010

Crop Destruct Issues
Whole bog management