

INSECT PEST MANAGEMENT

Update

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Outline

- ◆ Pheromone Control
- ◆ Chemical Control
 - CM/NOW
 - WHF

Pheromone Mating Disruption

- ◆ Early experiments - 1988 to 1992
- ◆ Puffers - 1995 to 1998
- ◆ Alternate emitters - 2000 to present
- ◆ Demonstrations - 2005 to Present

Early experiments - 1988 to 1992



Results - Pacific Bio Control Pheromone Dispensers Walnut, Marysville

Rate Dispenser/Ac	Mean No. CM Infested Dropped Nuts/Tree	Mean Percent Infestation at harvest
1200	0.6 a	0.3 a
800	1.0 a	1.5 ab
Lorsban 1.5X	—	1.7 b
Untreated	4.8 b	4.2 c

Puffers - 1995 to 1998



Alternative emitters - 2000 to 2008



Standardized Meso Treatment at 24 dis./ac)

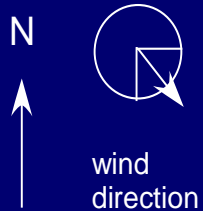
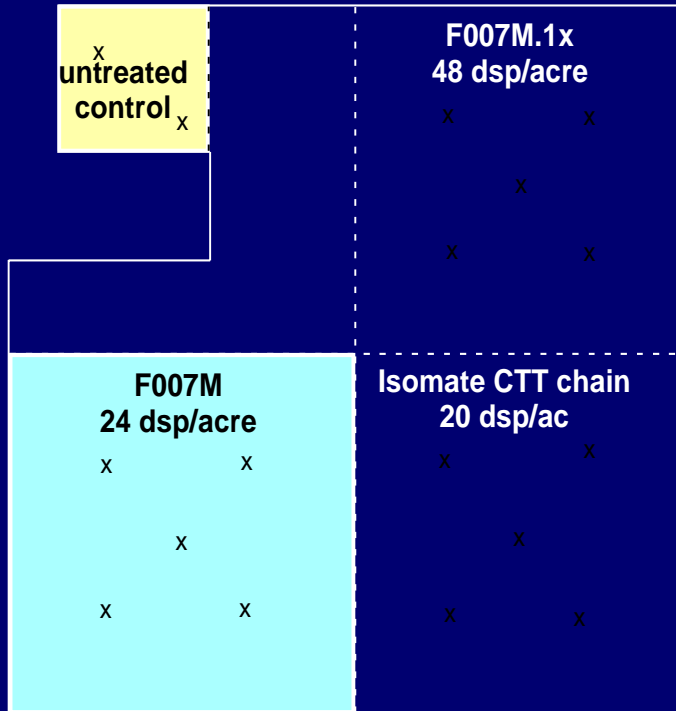
Linden Walnuts

Ferrari Farms

Standardized Meso Efficacy Trial

Site information:

organic walnuts
18 acres
Variety: Payne
5-acre treatment
1-acre untreated



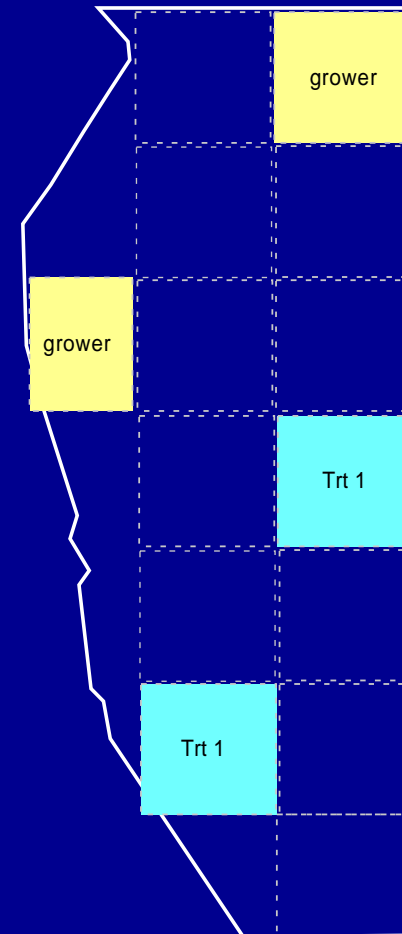
Modesto Walnuts

Wente Ranch
Riverbank, CA 95367

Standardized Meso Efficacy Trial

Site information:

Orchard block 6
99 acres
Variety: Ashley
25' x 25' planting
4.9 acre/plot



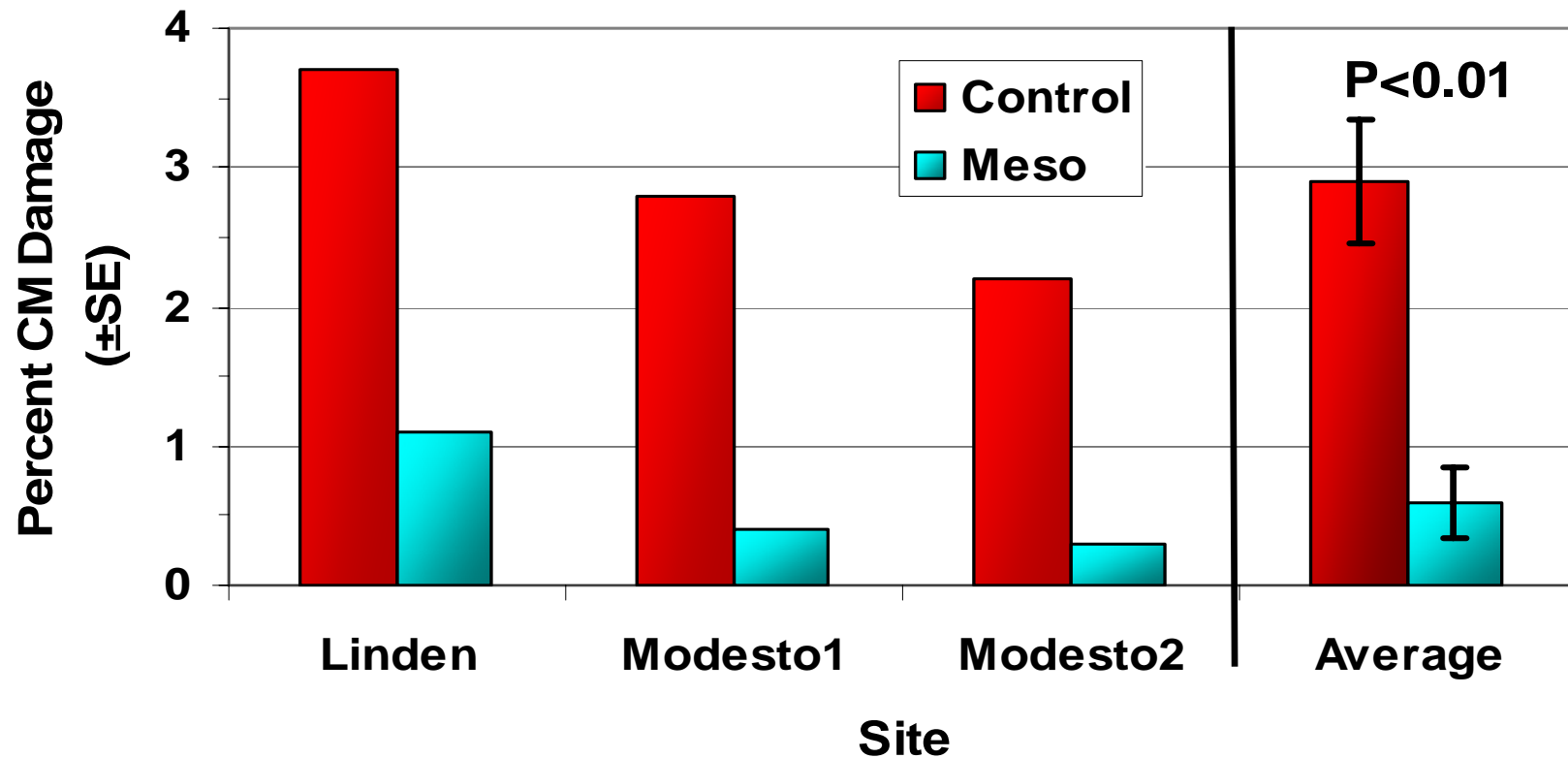
- Suterra F007M 24dsp/ac
- Control - Grower Standard



Codling Moth Harvest Damage

Standardized Meso Plots

2007 Walnuts: Percent Codling Moth Damage in
Meso Emitter Trials (F007 24 dsp/ac)

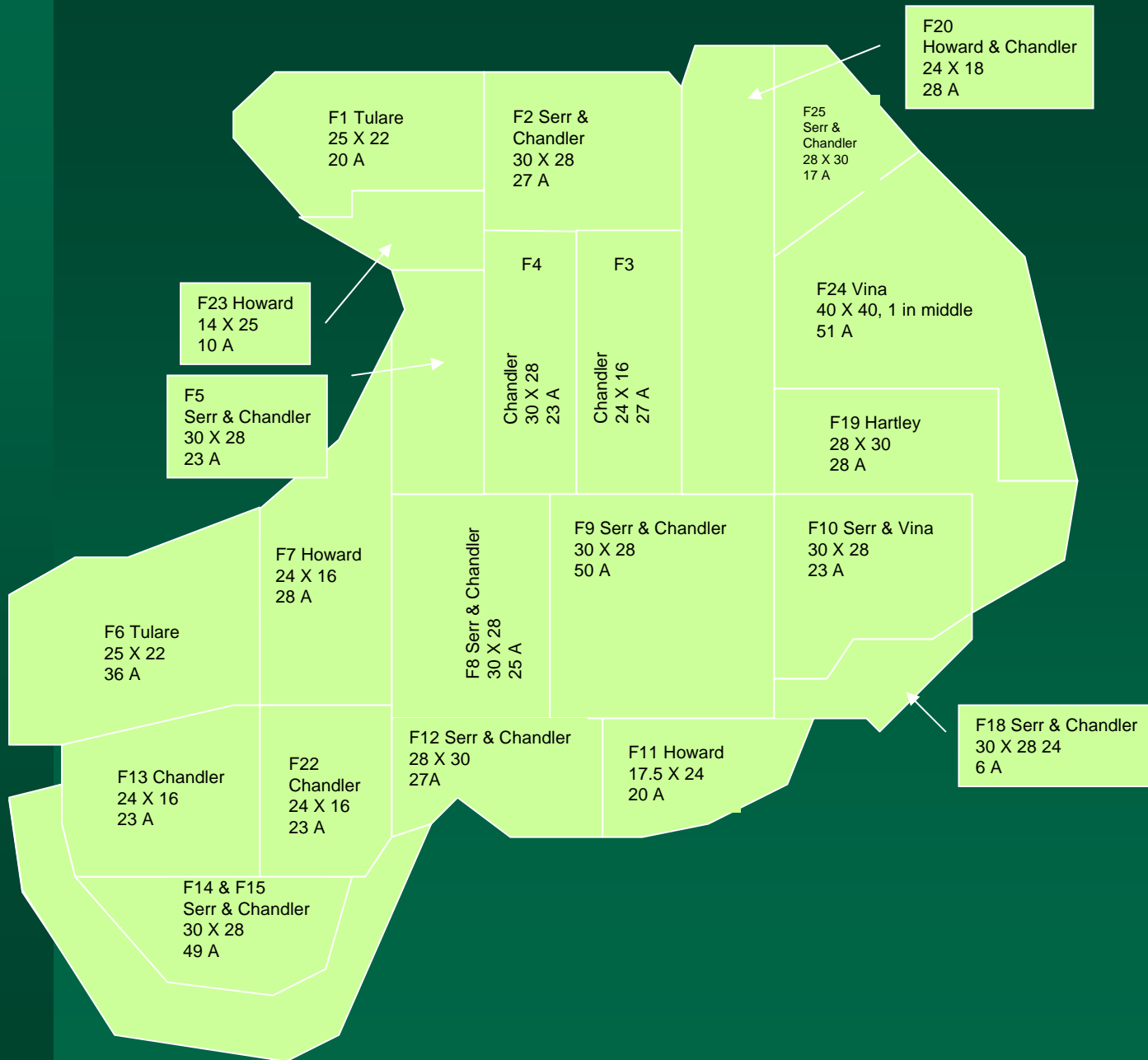


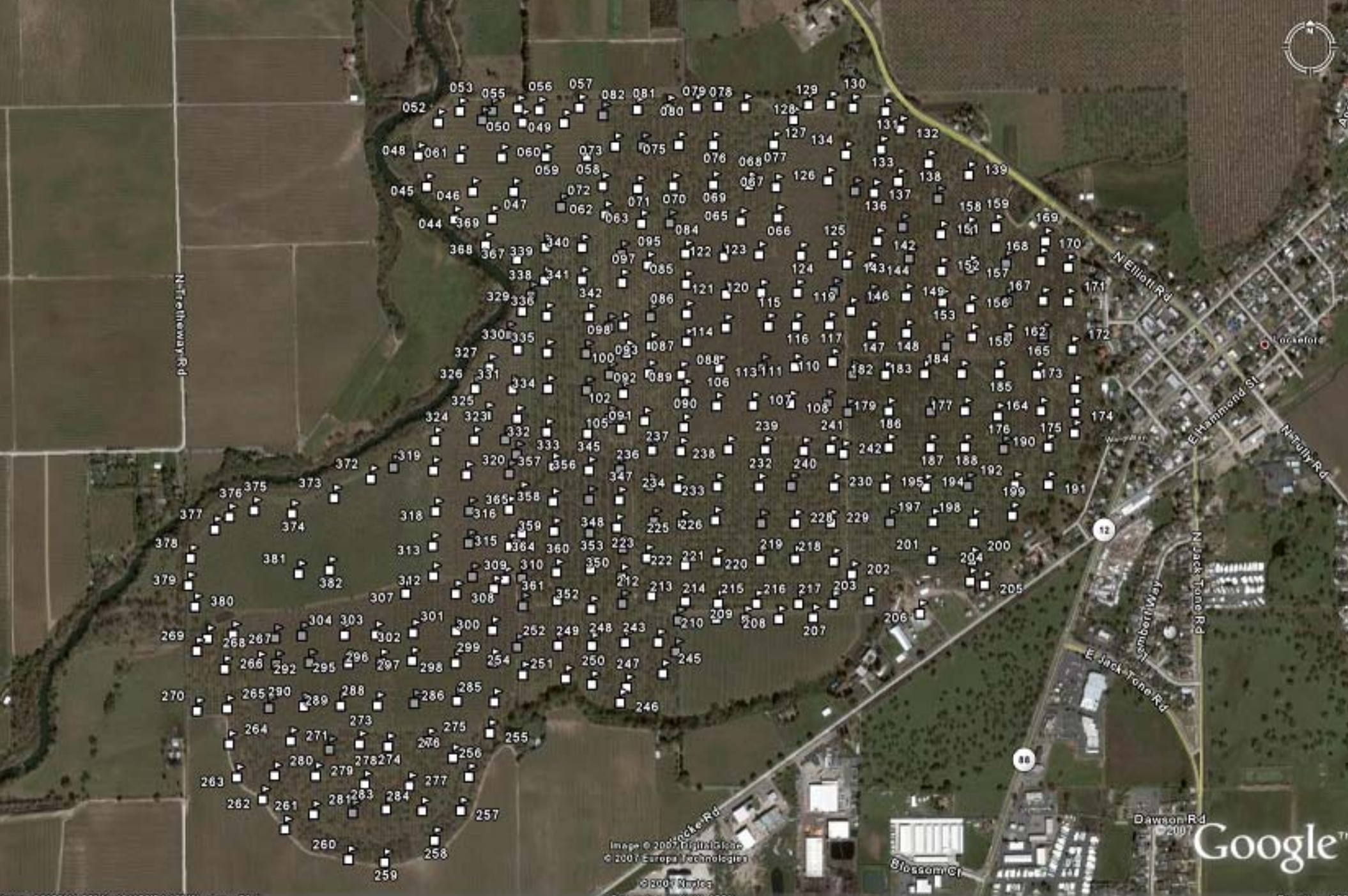
Method - Demonstration Trial

- ◆ San Joaquin 564 ac - 22 block
- ◆ Glen 180 ac - 3 block
- ◆ 1 Puffers/ 2 Ac
- ◆ San Joaquin - most blocks treated once with Lorsban, Brigade or Warrior
- ◆ Glen - 2 blocks treated once with Asana

Locke Ranch Puffer Trial
San Joaquin County
T4N R7E

560 acres





N. Tretheway Rd

N. Elliott Rd

E. Hammond St

N. Holly Rd

N. Jack-Tone Rd

E. Jack-Tone Rd

Dawson Rd

Blossom Ct

Image © 2007 DigitalGlobe
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Google™

Results - Demonstration Trial

Location	No. samples with various CM infestation at harvest						
	0	0.2	0.4	0.6	0.8	1.0	1.2
San Joaquin	11	4	4	0	1	0	1
Glen	4	2	1	1	0	0	0

Chemical Control

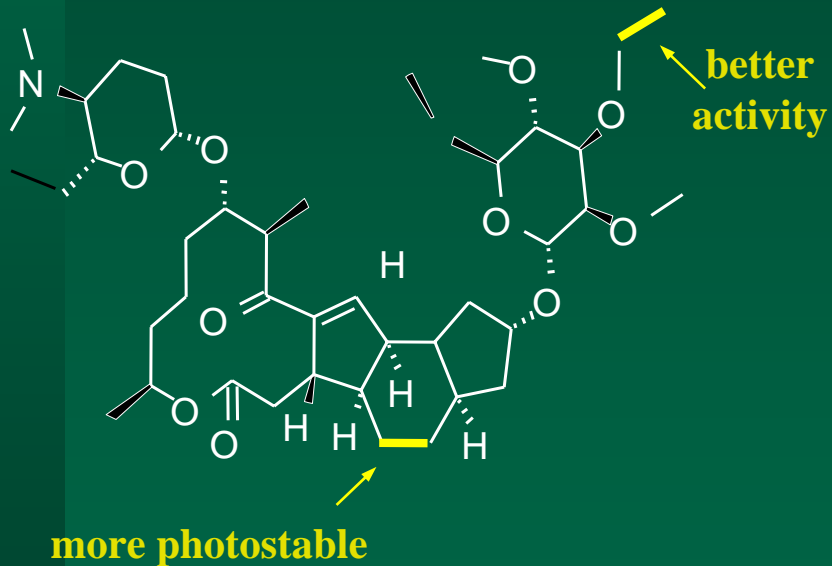
- ◆ Delegate 25WG
- ◆ Altacor 35 WG
- ◆ Brigade 10WP/Warrior 1CS
- ◆ Success/GF-120

Delegate 25WG

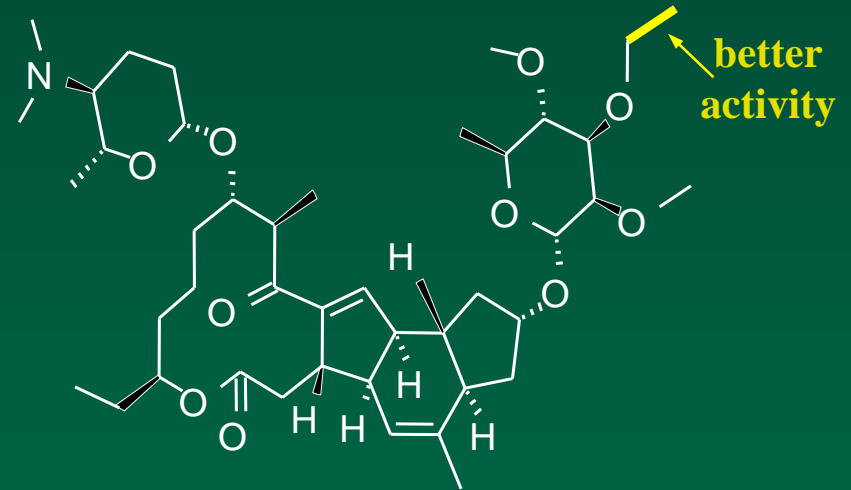
Chemical modified isomers
of spinosyn
(Second generation spinosyns)

Spinetoram

Major component



Minor component



Chemical modification of spinosyn that resulted in increased photostability and improved efficacy

Altacor 35WG

chlorantraniliprole = Rynaxypyr™

Anthranilamide

New mode of action

It is derived from

Ryania speciosa

Altacor 35WG

Activates the ryanodine receptor
in the muscle causing
release of stored calcium which in
turn impairs muscle regulation

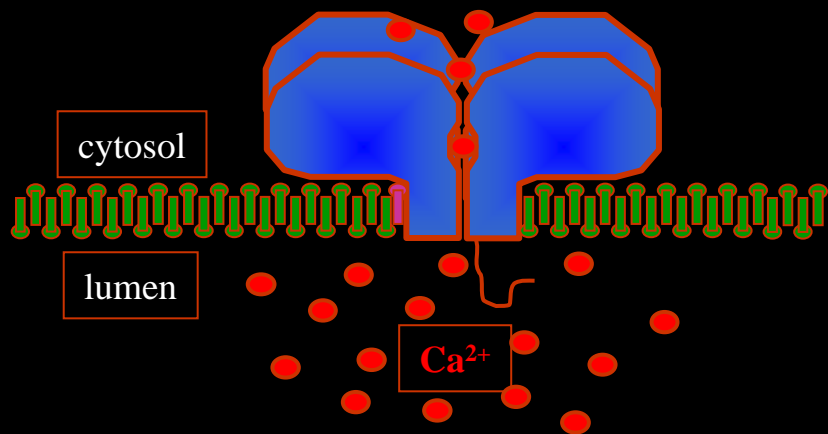
DuPont™ RynaXypyr™ Novel Mode of Action

Activates Insect Ryanodine Receptors

Ryanodine Receptor:



Plays a critical role in
muscle contraction



RynaXypyr™:

Rynaxypyr binds to this
receptor, causing uncontrolled
release of calcium,
to the point of depletion
Result: muscle paralysis

CM Efficacy in Walnuts 2005

Treatment	Rate/ac	No. Appl.	% CM	% Total
Delegate 25WG	4.5 oz	4	1.0 ab	1.0 ab
Delegate 25WG	6.0 oz	4	0.5 ab	0.5 ab
Altacor 35WG	2.0 oz	4	1.8 b	2.0 b
Altacor 35WG	4.0 oz	4	0.5 ab	0.5 ab
Warrior 1CS	2.5 oz	4	0.0 a	0.0 a
Warrior 1CS	5.0 oz	4	0.0 a	0.0 a
Grower standard		4	0.8 ab	0.8 ab
Untreated check			21.8 c	22.5 c

CM Efficacy in Walnuts 2007

Treatment	Rate/ac	No. Appl.	% CM	% Total
Delegate 25WG	4.8 oz	2	0.2 a	0.2 a
Delegate 25WG	6.4 oz	2	0.2 a	0.2 a
Altacor 35WG*	3.0 oz	2	0.8 ab	0.8 ab
Altacor 35WG	3.0 oz	2	0.2 a	0.2 a
Altacor 35WG	4.0 oz	2	0.2 a	0.2 a
Grower standard		2	2.2 b	2.4 b
Untreated check			5.8 c	6.2 c

*Treatment includes 0.25% PureSpray Green horticultural oil volume to volume.

Brigade 10WP & Warrior 1CS for Navel Orangeworm Control



Results - Insecticides for NOW Control

Mean % Infested or Damaged Nuts

Material	1983	1984	1985	1986	
				Early	Late
Guthion	0.6 a	1.0 a	0.3 a	1.5 ab	5.0 ab
Brigade	0.4 a	0.6 a	0.8 a	0.3 a	1.8 a
Lorsban	—	—	1.0 a	1.7 b	5.5 ab
Control	2.6 b	4.5 b	1.5 a	5.6 c	7.0 b

Results - CM Control in Pear

Treatment	Rate/ac	No. Appl.	% Infestation
Warrior 1SC	5.0 oz	3	6.6 a
Brigade 10WP	1.0 lb	3	5.7 a
Danitol 2.4EC	21.0 oz	3	11.9 a
Asana XL	12.0 oz	3	10.2 a
Baythroid 2	3.0 oz	3	9.1 a
Grower standard		3	4.8 a
Untreated check			82.0 b







G67-32







Olive Fruit Fly Sprayer

by PBM Supply & Mfg., Inc.



Sprayer Specifications:

- 15 gallon poly tank
- 12 Volt diaphragm pump
- 1.4 GPM, maximum 65 psi
- Pressure regulator
- Oil-filled gauge
- Suction filter

Olive Fly Boom Specifications:

- Adjustable swivel for pattern
- D3 orifices
- 2 manual on/off valves
- Adjustable height
- Easily Mounted to an ATV or utility vehicle
- Set to spray 1 gallon per sprayed acre

Options:

PBM toggle-2, 12 Volt control box with 12 Volt kit solenoid valve, easily mounted onto ATV handle bars
Larger tanks and trailer sprayers available



Call Today!

1-800-688-1334

PBM Supply & Mfg., Inc.

324 Meyers Street Chico, CA 95928

P.O. Box 3129 Chico, CA 95927

2870C San Antonio Dr. Fowler, CA 93625

P.O. Box 430 Fowler, CA 93625

www.pbmsprayers.com

ATV Specifications

1. 12 volt external battery with plastic housing.
2. Electronic radar to be used as speedometer, as well as to aid in calibration
3. 25 gallon spray tank.
4. 100 psi pump.
5. Miscellaneous hoses to route material from tank to boom.
6. Three toggle switches with electronic solenoid for each.
 - Switch which operates left side of boom.
 - Switch which operates right side of boom.
 - Thumb trigger switch to act as overall power switch for material delivery.

ATV Specifications

7. Square tubing for boom construction (various lengths and sizes)
 - Boom can slide vertically to adjust overall spray height.
 - Boom can expand outward or vertically 3 feet per side.
 - Ends of boom are mounted on spring loaded hinges which are expandable for easy storage.
8. Miscellaneous wires to plumb the electrical system.
9. Nozzle quick change adapters mounted on ends of boom for easy nozzle removal and disc size changes.
10. Bung on bottom of 25 gallon tank for easy clean out or left over material capture.

Methods - GF-120 Rate and Timing Comparison - 2002

◆ Stockton, CA

- 40 oz GF-120/ac every other week (5 applications)
- 20 oz GF-120/ac every week (9 applications)
- 40 oz GF-120/ac every week (9 applications)
- 20 oz blank bait/ac every other week (5 applications)
- Grower standard of Malathion with NuLure (2 applications)

Methods - GF-120 Rate and Timing Comparison - 2002

- ◆ Dilute GF-120 (1:4) applied from July 10-Sept. 11
- ◆ Spray Retention: 60%

Results - GF-120 Rate and Timing Comparison - 2002

Treatment	# of Applications	Mean Total Flies/Trap	Mean % Infested Fruit
40 oz	5	588.3 b	1.3 a
20 oz	9	542.0 b	0.7 a
40 oz	9	323.7 a	0.7 a
20 oz Blank	5	590.0 b	5.3 b
G.S.	2	992.0	23.2

Methods - Product Swap - 2004

◆ Upper Lake, CA

- Success @ 0.64 oz/ac spot sprayed (4 applications)
- Lorsban or Malathion @ 0.4 pt/ac spot sprayed (4 applications)
- Blank bait control
- * Success, Lorsban or Malathion applied with 0.4 pt NuLure in 10 gal/ac

Methods - Product Swap - 2004

- ◆ Success, Lorsban or Malathion applied from July 30 - Sept. 13

Results- Product Swap - 2004

Upper Lake

Treatment	Rate (/ac)	# of Applications	Mean Total Flies/Trap	Mean % Infested Fruit
Success	0.64 oz	4	147.7 a	0.6 a
Lorsban	0.40 pt	2	133.7 a	0.8 a
+Malathion	0.40 pt	2		
Control	—	4	120.0 a	5.9 b

Methods - Timing and Comparison of Reduced Risk Insecticides - 2004

◆ Hollister 1, CA

- GF-120 @ 20 oz/ac weekly (9 applications)
 - GF-120 @ 20 oz/ac every other week (5 applications)
 - Entrust @ 1 oz/ac skip row (2 applications)
 - Blank bait control
- * Entrust applied with 2 pt NuLure in 40 gal/ac

Methods - Application Dates

- ◆ Applications of dilute GF-120 (1:4) July 1-Aug. 30
- ◆ Spray Retention: 75%
- ◆ Entrust sprayed on July 7 and Aug. 9

Results- Timing and Comparison of Reduced Risk Insecticides - 2004

Hollister 1

Treatment	Rate (/ac)	# of Applications	Mean Total Flies/Trap	Mean % Infested Fruit
GF-120	20.0 oz	9	14.3 a	0.2 a
GF-120	20.0 oz	5	13.0 ab	0.4 a
Entrust	1.0 oz	2	29.0 ab	0.3 a
Control	—	—	69.3 b	5.6 b