

What's New in Psyllid Management?



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Associate Professor of Entomology

Protection of young trees



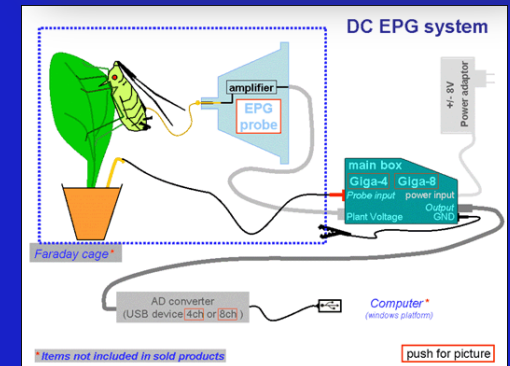
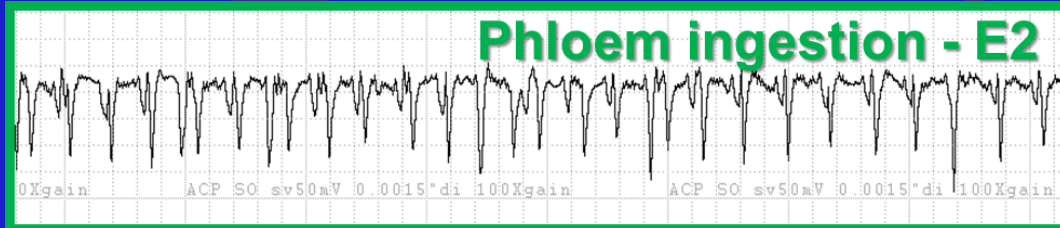
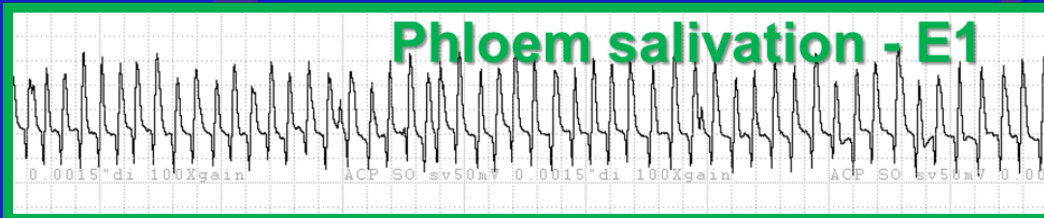
Soil-applied neonicotinoids

- **Foundation of young tree psyllid control programs**

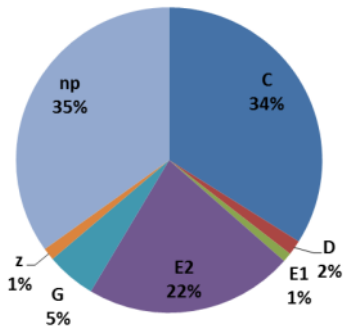
- Admire Pro (imidacloprid)
- Platinum 75 SG (thiamethoxam)
- Belay 50 WDG (clothianidin)
 - Non-bearing use only (Belay)



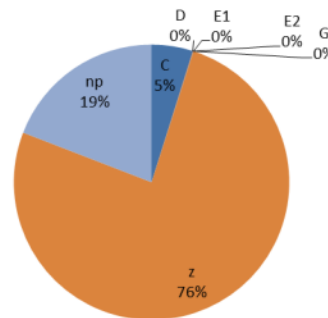
Soil-applied neonics can prevent phloem feeding by psyllids!



Duration of time performing each behavior (untreated)



Duration of time performing each behavior (Imidacloprid)



Season-long ACP control

(foliar applications to prevent pesticide resistance to neonics shown in orange)

Tree size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reset (<3')	P		A	A		B	B		A	A		P
1-2 yr (3-5')	P		A	B		B	B		B	A		P
3-5 yr (5-9') bearing				P		A			A			

A= Admire (imidacloprid); B=Belay (clothianidin); P=Platinum (thiamethoxam); Products are positioned for use at certain times of the year based on water solubility and likelihood for significant rain events.

How much protection?

- **Soil-applied neonicotinoids will not provide 100% protection from HLB**
 - Can expect <1-3% infection rate annually depending on local conditions
 - Distribution of product within plant
 - Affected by accuracy of application
 - Psyllid population pressure (surrounding areas)
 - The lower the psyllid population, the greater the success will be in keeping HLB spread low
 - “numbers game”
 - Foliar sprays will be important
 - CHMA’S!!!

Reports from Growers (2014)

- **Varied success in young tree protection**
 - Trees 3-4 years of age:
 - Average rate of HLB ~%10
 - Best case examples:
 - As low as 8% HLB where psyllid populations remain under control in surrounding areas
 - Where psyllid populations have not been controlled in surrounding areas up to 80% HLB by year 4



Season-long ACP control

(foliar applications to prevent pesticide resistance to neonics shown in orange)

Tree size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reset (<3')	P		A	A		B	B		A	A		P
1-2 yr (3-5')	P		A	B		B	B		B	A		P
3-5 yr (5-9') bearing				P		A			A			

A= Admire (imidacloprid); B=Belay (clothianidin); P=Platinum (thiamethoxam); Products are positioned for use at certain times of the year based on water solubility and likelihood for significant rain events.

Belay 2.13 SC (clothianidin)

- **Belay 50 WDG - Soil-applied neonicotinoid**
 - Currently cant be applied to bearing trees
- **Section 18 Emergency Use label was submitted (Feb 19 by FDACS to EPA) to allow application to bearing trees**
- **WHEN APPROVED, will permit two applications of Belay 2.13 SC to bearing trees in the 5-9' size class**

Season-long ACP control

(foliar applications to prevent pesticide resistance to neonics shown in orange)

Tree size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reset (<3')	P		A	A		B	B		A	A		P
1-2 yr (3-5')	P		A	B		B	B		B	A		P
3-5 yr (5-9') bearing				P		A			A			

A= Admire (imidacloprid); B=Belay (clothianidin); P=Platinum (thiamethoxam); Products are positioned for use at certain times of the year based on water solubility and likelihood for significant rain events.

Addition of Belay (bearing label)

(foliar applications to prevent pesticide resistance to neonics shown in orange)

Tree size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reset (<3')	P	A	A	P	B	B	A	A	A	P		
1-2 yr (3-5')	P	A	B	B	B	B	B	B	A	P		
3-5 yr (5-9') bearing			B	P	A	B	A					

A= Admire (imidacloprid); B=Belay (clothianidin); P=Platinum (thiamethoxam)

Status of Belay Label

- **Belay 2.13 SC (Section 18 label)**
 - Should have been approved by EPA for use beginning April 1, 2014...has yet to get final EPA approval
- **It is expected that FDACS will issue a **CRISIS EXEMPTION TODAY (April 8)** to allow application of Belay to bearing trees until EPA provides the final approval of the Section 18 label that has been submitted**

Belay Insecticide (2.13 SC)

- **Maximum of 24 fl oz / A per growing season**
 - Provides two (2) applications at a rate of 12 fl oz/A to trees 5-9' tall
 - Soil-drench applications only (no foliar sprays)
- **PHI: 1 day**
- **Minimum interval between applications**
 - 4 months
- **For trees 5-9' in height – “Do not apply *Belay* from November 1st through the end of the following bloom period.”**

Must be in possession of the label to make applications!!!

SECTION 18 EMERGENCY EXEMPTION FOR THE USE OF BELAY® INSECTICIDE FOR SUPPRESSION OF HUANGLONGBING DISEASE TRANSMISSION BY ASIAN CITRUS PSYLLID



BELAY®
INSECTICIDE

(EPA Reg. No. 59639-150)

For distribution and use only in the state of Florida

Active ingredient (Clothianidin)..... 23.60 %
Other ingredients..... 76.40 %
100.00 %

Belay® Insecticide contains 2.13 pounds of the active ingredient clothianidin per gallon

Effective use date:
Expiration use date:
File identification:

For use in connection with an emergency exemption authorized under the provisions of Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended. This Section 18 label contains directions for use that do not appear on the EPA registered label of Belay® Insecticide. Please refer to the production label for additional information.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Always read and follow all label directions, restrictions and precautions when using any pesticide alone or in tank mix combinations. The most restrictive labeling applies when using a tank mix.

Applicable directions, restrictions and precautions on the registered product label for Belay® Insecticide (EPA Registration No. 59639-150) must be followed.

CITRUS FRUIT

Australian Desert Lime; Australian Finger-Lime; Australian Round Lime; Brown River Finger Lime; Calamondin; Citron; Citrus Hybrids; Grapefruit; Japanese Summer Grapefruit; Kumquat; Lemon; Lime; Mediterranean Mandarin; Mount White Lime; New Guinea Wild Lime; Orange, Sour; Orange, Sweet; Pummelo; Russell River Lime; Satsuma Mandarin; Sweet Lime; Tachibana Orange; Tahiti Lime; Tangelo; Tangerine (Mandarin); Tangor; Trifoliolate Orange; Uniq Fruit; Cultivars, Varieties, and/or Hybrids of these

Soil Drench Application Method: Based on tree size, mix required dose in water and apply 8-12 fl oz of solution uniformly around the base of each tree, directed at the root zone. For optimal uptake and performance, keep soil moist for 7 days following application via irrigation or rainfall. To ensure efficacy, the application site around the base of the tree should be as weed-free as possible.

April 2014

SOIL DRENCH APPLICATION			
Disease Suppressed		Pests Controlled	
Huanglongbing Disease Transmission by Asian Citrus Psyllid		Asian Citrus Psyllid	
Soil Drench Rate Chart Based on Tree Height			
Tree Size	Belay Insecticide Rate/Acre	Belay Insecticide Rate/Tree ¹	Application Restrictions
New plantings or resets, less than 3 feet tall	3.0 fl oz/acre (0.05 lb ai)	0.02 fl oz/tree (0.0003 lb ai/tree)	Allow a minimum of 6 weeks between applications.
One to two year old trees, 3 to 5 feet tall	6.0 fl oz/acre (0.1 lb ai)	0.04 fl oz/tree (0.0007 lb ai/tree)	Allow a minimum of 6 weeks between applications.
Three to five year old trees, 5 to 9 feet tall	12.0 fl oz/acre (0.2 lb ai)	0.08 fl oz/tree (0.0013 lb ai/tree)	<ul style="list-style-type: none"> Allow a minimum of 4 months between Belay applications. Do not apply more than two applications per tree per 12 month period. Do not apply Belay from November 1st through the end of the following bloom period. Pre-harvest Interval (PHI) = 1 day

¹Application rates per tree are based on a population of 150 trees/acre.

Do not apply more than 12.0 fl oz per acre of Belay® Insecticide or exceed 0.2 lb active ingredient clothianidin per application per acre, regardless of tree size, tree count per acre or application method.

Do not apply more than 24.0 fl oz per acre of Belay® Insecticide or exceed 0.4 lb active ingredient clothianidin per acre per 12 months regardless of tree size, tree count per acre, or application method.

ENVIRONMENTAL HAZARDS

This product is toxic to aquatic invertebrates. Do not apply when weather conditions favor drift from treated areas. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate.

This product is toxic to bees exposed to treatment and for more than 5 days following treatment. Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period. Fall soil application of 3-5 year old citrus may pose risks to honey bees that forage in the trees during the winter/spring bloom. Applicators are advised to help mitigate such risks by cooperating with the Florida Department of Agriculture and Consumer Services in its efforts to communicate hive location/placement options with local beekeepers. For further information, see www.FloridaBeeProtection.org.

In the State of Florida: The properties of this chemical suggest it may leach into ground water if used in areas where soils are permeable and where the water table is very shallow. Do not apply within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries or commercial fish farm ponds.

This labeling must be in possession of the user at the time of pesticide application.

Please contact Valent U.S.A. Corporation at 1-800-6-VALENT (682-5368) if you have questions regards use of this product.

Registrant: Valent U.S.A. Corporation
P.O. Box 8025
Walnut Creek, CA 94596-8025

Belay is a registered trademark of Valent U.S.A. Corporation.

April 2014

Kaolin for Psyllid Control



Kaolin (Surround WP)

Compatibility with Insecticides

- **Previous studies have shown to be compatible with contact insecticides**
 - Where residues stay on leaf and kill insect when contact made
- **Is kaolin compatible with translaminar and systemic insecticides?**
 - Where insecticide needs to move into leaf
 - Movento, Agri-mek, Admire (foliar), Actara, etc...
 - “Surfactant driven systemics”

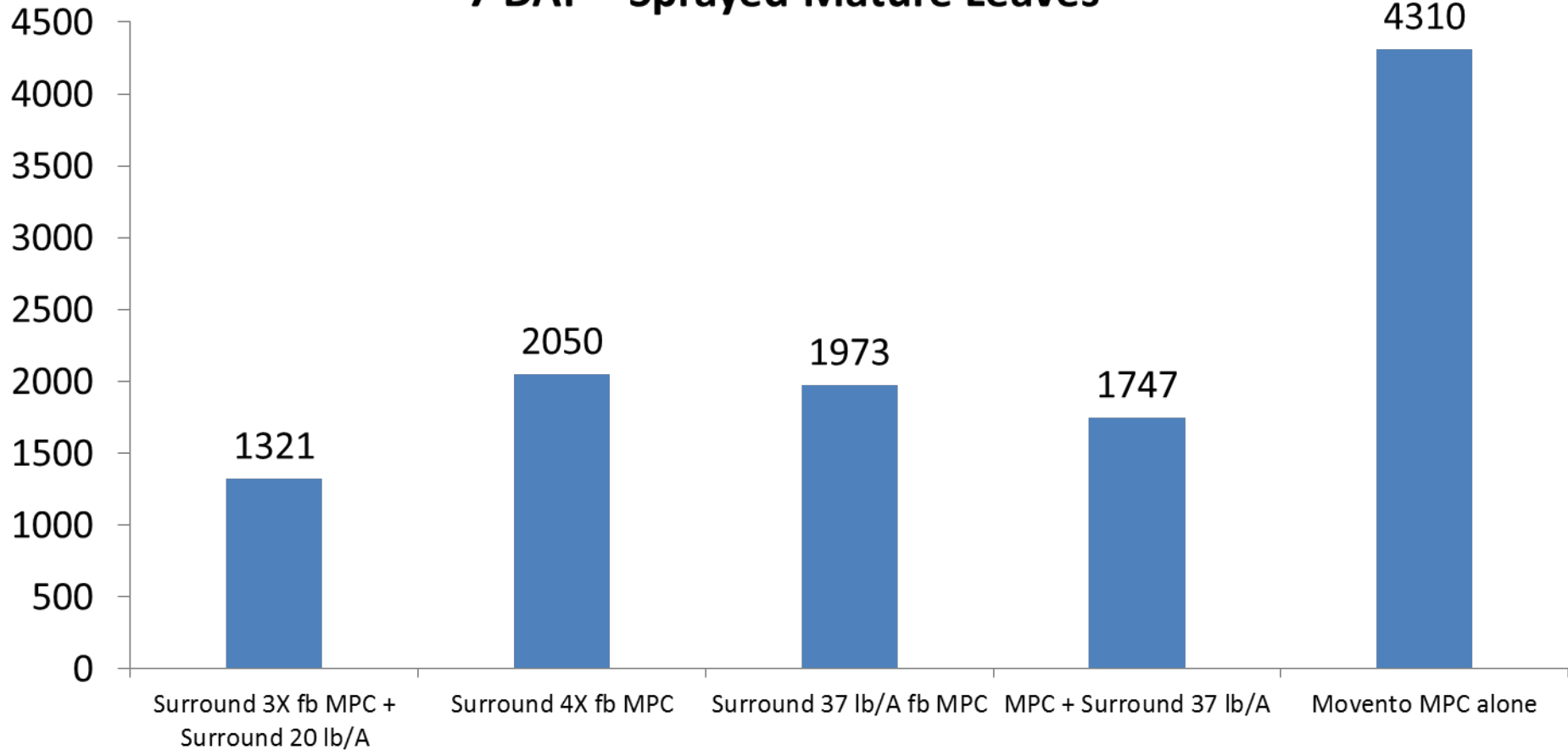
Bayer / Grower Trial

- **Applied Movento alone, tank mixed with Surround, and following multiple applications of Surround to determine effects on Movento application.**
- **Measured systemic movement of Movento into new leaf tissue as a means of determining if Surround inhibits absorption of Movento by leaf surface**

Movento MPC Residues as effected by Surround

(provided by Mike Edenfield – Bayer CropScience)

7 DAT – Sprayed Mature Leaves

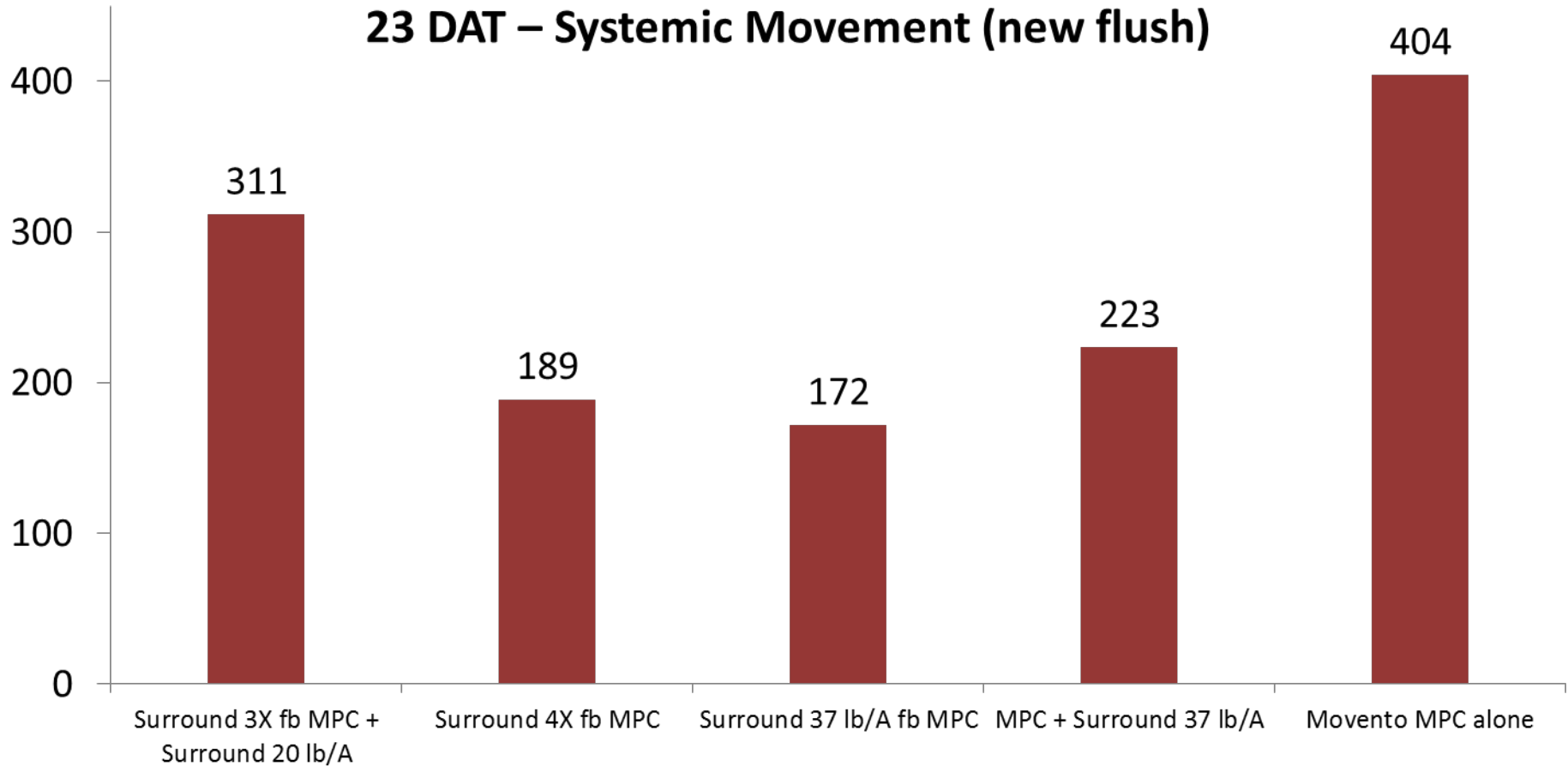


Movento MPC at 16 oz/A + Induce at 0.25 % v/v was sprayed in airblast sprayer at 142 GPA and 1.8 MPH; except trt 6 which was sprayed at 72 GPA. Surround applications were 50 lb, 20 lb, and 20 lb sprayed 30 days apart. For trts 2 and 3, Surround at 20 and 36 lbs/A was sprayed the day before Movento MPC.

Movento MPC Residues as effected by Surround

(provided by Mike Edenfield – Bayer CropScience)

23 DAT – Systemic Movement (new flush)



Movento MPC at 16 oz/A + Induce at 0.25 % v/v was sprayed in airblast sprayer at 142 GPA and 1.8 MPH; except trt 6 which was sprayed at 72 GPA. Surround applications were 50 lb, 20 lb, and 20 lb sprayed 30 days apart. For trts 2 and 3, Surround at 20 and 36 lbs/A was sprayed the day before Movento MPC.

Movento (spirotetramat) residues as effected by Surround

(provided by Mike Edenfield – Bayer CropScience)

Conclusions:

- Tank-mixing Surround at 20 lb/A with Movento MPC reduced spirotetramat residues 69% 7 days after treatment. Systemic Movento metabolites on new flush were reduced 23% 23 days after treatment (Trt 5 vs 1).
- Tank-mixing Surround at 37 lb/A with Movento MPC reduced spirotetramat residues 59% 7 days after treatment. Systemic Movento metabolites on new flush were reduced 45% 23 days after treatment (Trt 5 vs 4).
- Movento MPC applied 1 day after Surround at 36 lb/A reduced spirotetramat residues 54%. Systemic Movento metabolites on new flush were reduced 45% 23 days after treatment (trt 5 vs 3).

Implications: Do not tank-mix Movento with Surround. Movento should be applied prior to any Surround application.

ADDITIONAL STUDIES BY BAYER ONGOING

New Insecticide Products

- **Closer SC (sulfoxaflor)**
 - Dow AgroSciences
- **Exirel & Verimark (cyazypyr)**
 - DuPont
- **Apta (tolfenpyrad)**
 - Nichino

Closer SC (Sulfoxaflor)

• Group 4c insecticide

- No cross-resistance to group 4a (neonics)
- PHI: 1 day
- REI: 12 hours
- Asian citrus psyllid, scale insects, mealybugs, aphids
- Controls both adult and nymph stages of Asian citrus psyllid
- Disrupts pathogen transmission due to rapid kill (less than 5 hrs)
- **One application permitted during bloom!**



Specimen Label

Dow Dow AgroSciences

Closer™ **SC**

INSECTICIDE

®/™Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

For control or suppression of aphids, fleahoppers, plant bugs, stink bugs, whiteflies and certain psyllids, scales, and trips in Brassica (cole) leafy vegetables, citrus, cucurbit vegetables, fruiting vegetables, leafy vegetables (except Brassica), leaves of root and tuber vegetables, low growing berry, okra, pistachio, pome fruits, small fruit vine climbing (except fuzzy kiwifruit) except strawberry, strawberry, stone fruits, tree nuts, and watercress.

Group	4C	INSECTICIDE
Active Ingredient:		
sulfoxaflor		21.8%
Other Ingredients		78.2%
Total		100.0%

Contains 2 lb active ingredient per gallon.

Precautionary Statements

Hazard to Humans and Domestic Animals
EPA Reg. No. 62719-623

CAUTION
Causes Moderate Eye Irritation
Avoid contact with eyes or clothing.

Personal Protective Equipment (PPE)
Applicators and other handlers must wear:
• Long-sleeved shirt and long pants
• Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:
• Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
• Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid
If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Toxicity is reduced when spray droplets are dry.
Risk to managed bees and native pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7:00 am or after 7:00 pm local time or when the temperature is below 50° F at the site of application.
Refer to the Directions for Use for crop specific restrictions and additional advisory statements to protect pollinators.
Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

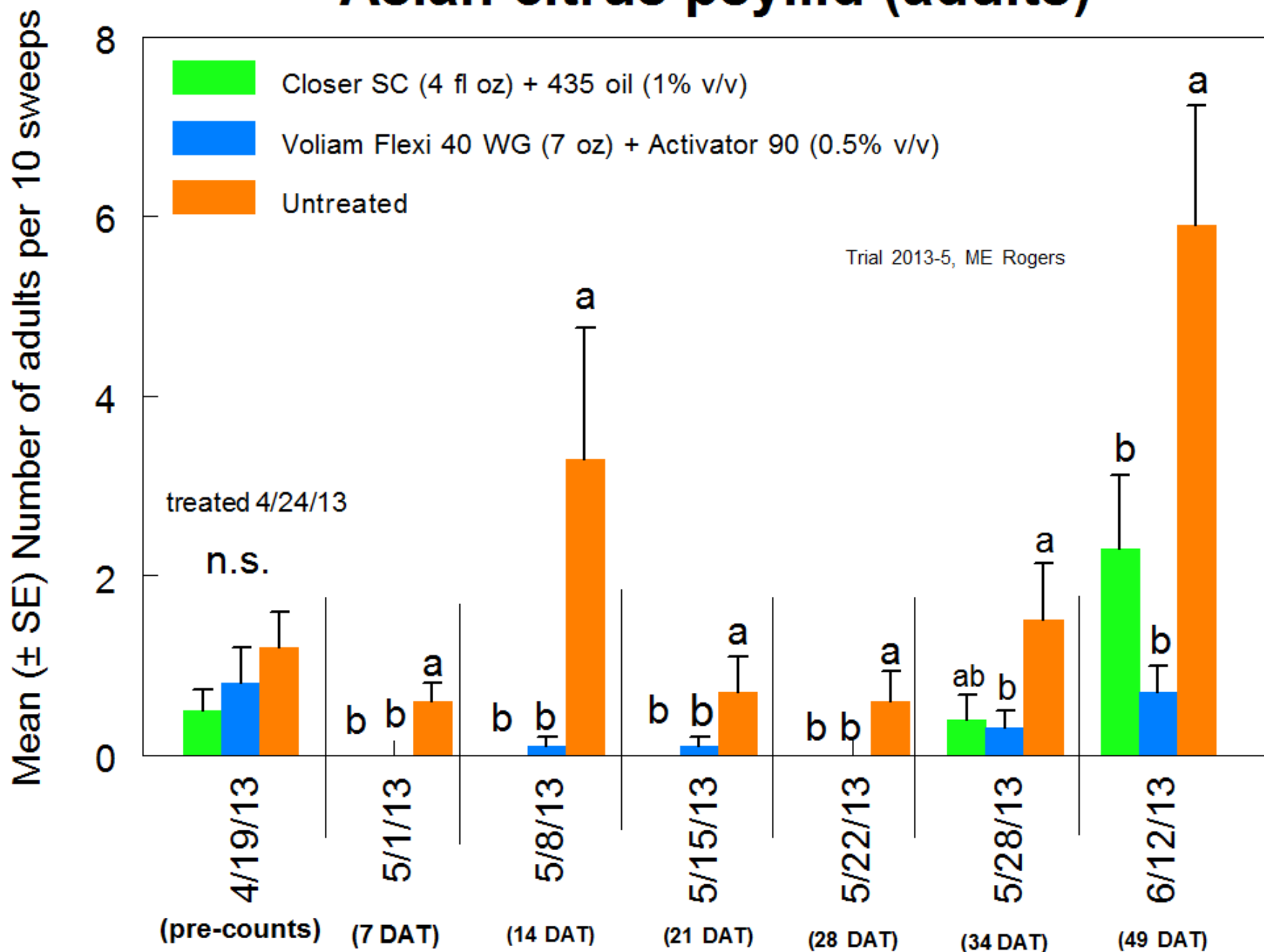
Directions for Use
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.
Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. The Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.
Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.
PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:
• Coveralls
• Shoes plus socks

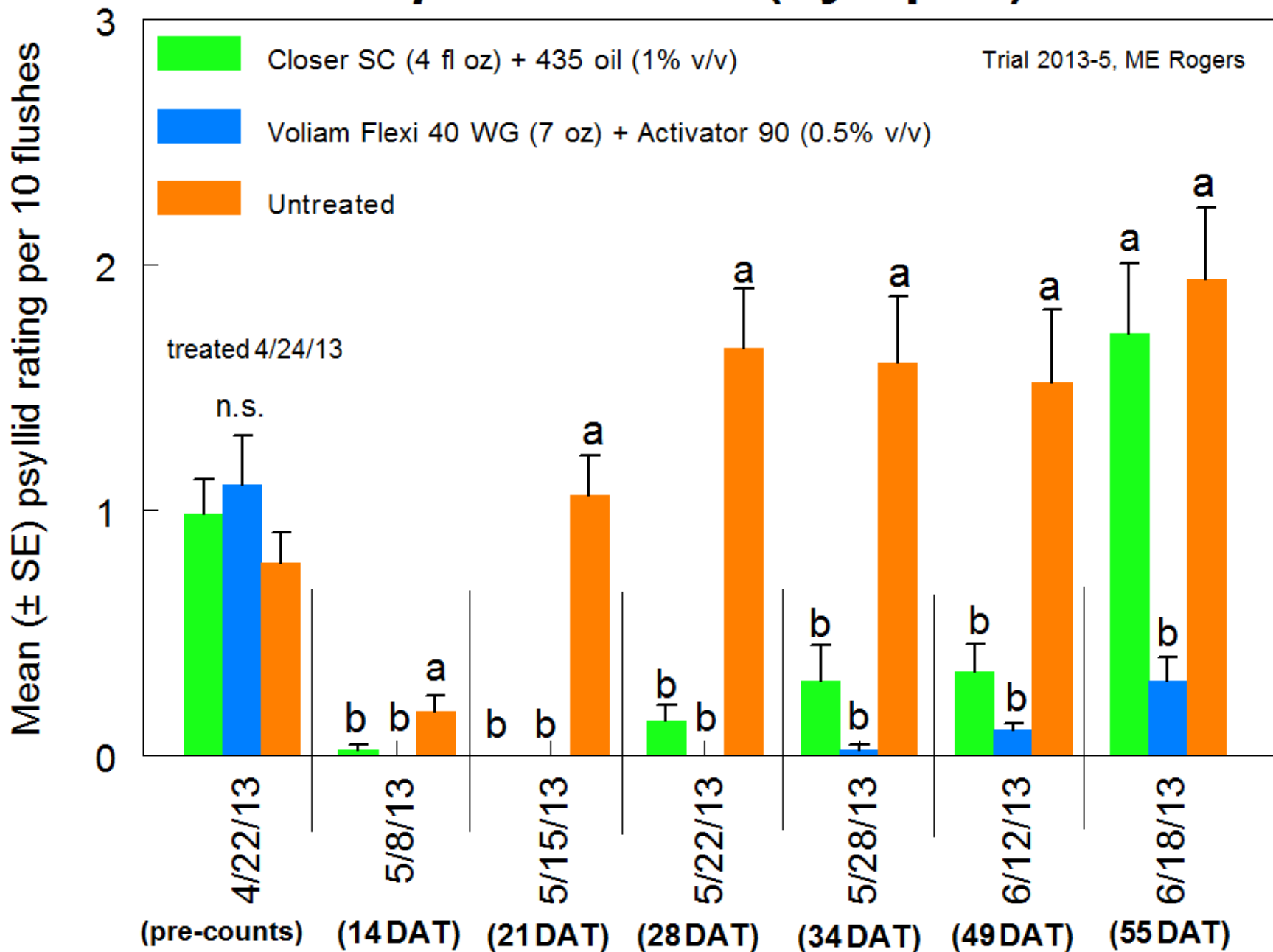
Non-Agricultural Use Requirements
The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.
Do not enter or allow others to enter the treated area until sprays have dried.

Storage and Disposal
Do not contaminate water, food or feed by storage or disposal.
Pesticide Storage: Store in original container only.
Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.
Nonrefillable rigid containers 5 gallons or less:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Asian citrus psyllid (adults)

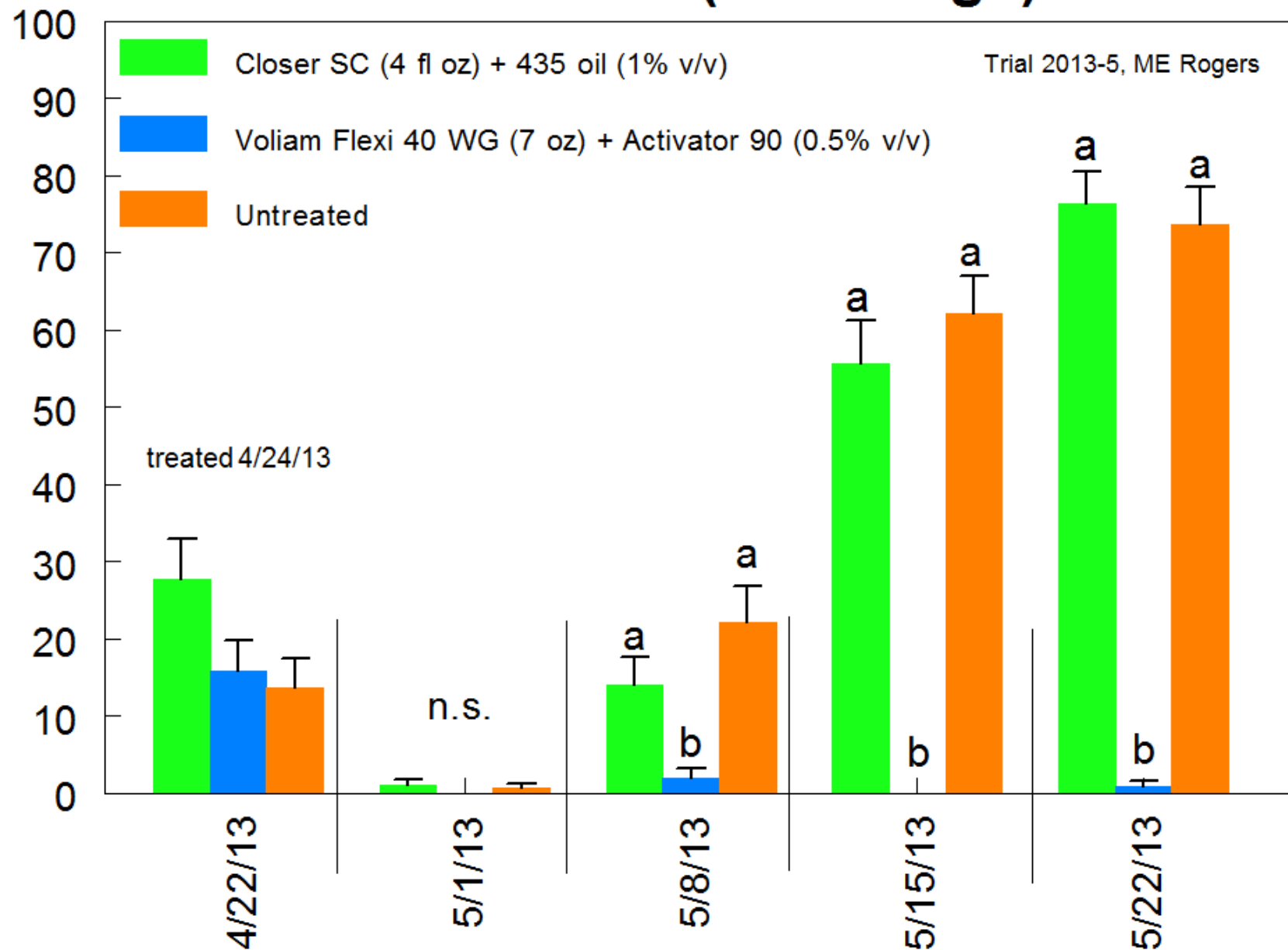


Diaphorina citri (nymphs)



Citrus Leafminer (% damage)

Mean (\pm SE) percent leaf damage per 10 flushes



Exirel (cyazypyr)

- **Group 28 insecticide**
 - Only other insecticide with same MOA designation is Voliam Flexi which contains chlorantraniliprole
 - PHI: 1 day
 - REI: 12 hours
 - Citrus leafminer, Asian citrus psyllid
 - Controls populations of both psyllid adults and nymphs

DUPONT

DuPont™ Exirel™
INSECT CONTROL
WITH THE ACTIVE INGREDIENT CYAZYPYR®

GROUP	28	INSECTICIDE
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For foliar applications to brassica, bulb, cucumber, fruiting, and leafy vegetables; commercially grown greenhouse eggplant, pepper and tomato; bushberries; citrus, pome, and stone fruits; and tree nuts for pest management of sucking and chewing insects, suppression of certain insect vectored diseases and optimization of the crop's potential.

Active Ingredient	By Weight
Cyantraniliprole	
3-bromo-1-(3-chloro-2-pyridinyl)-N-[4-cyano-2-methyl-6-[(methylamino)carbonyl]phenyl]-1H-pyrazole-5-carboxamide	10.20%
Other Ingredients	89.80%
TOTAL	100.00%

EXIREL™ is a suspoemulsion (oil in water emulsion). SHAKE WELL BEFORE USING.
Contains 0.83 lb. active ingredient per gallon.
EPA Reg. No. 352-859
Nonrefillable Container
Net: _____
OR
Refillable Container
Net: _____
E. I. du Pont de Nemours and Company
1007 Market Street
Wilmington, Delaware 19898
Phone: 1-800-441-7515 (Toll Free)

EPA Est. No. _____

KEEP OUT OF REACH OF CHILDREN
CAUTION
Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

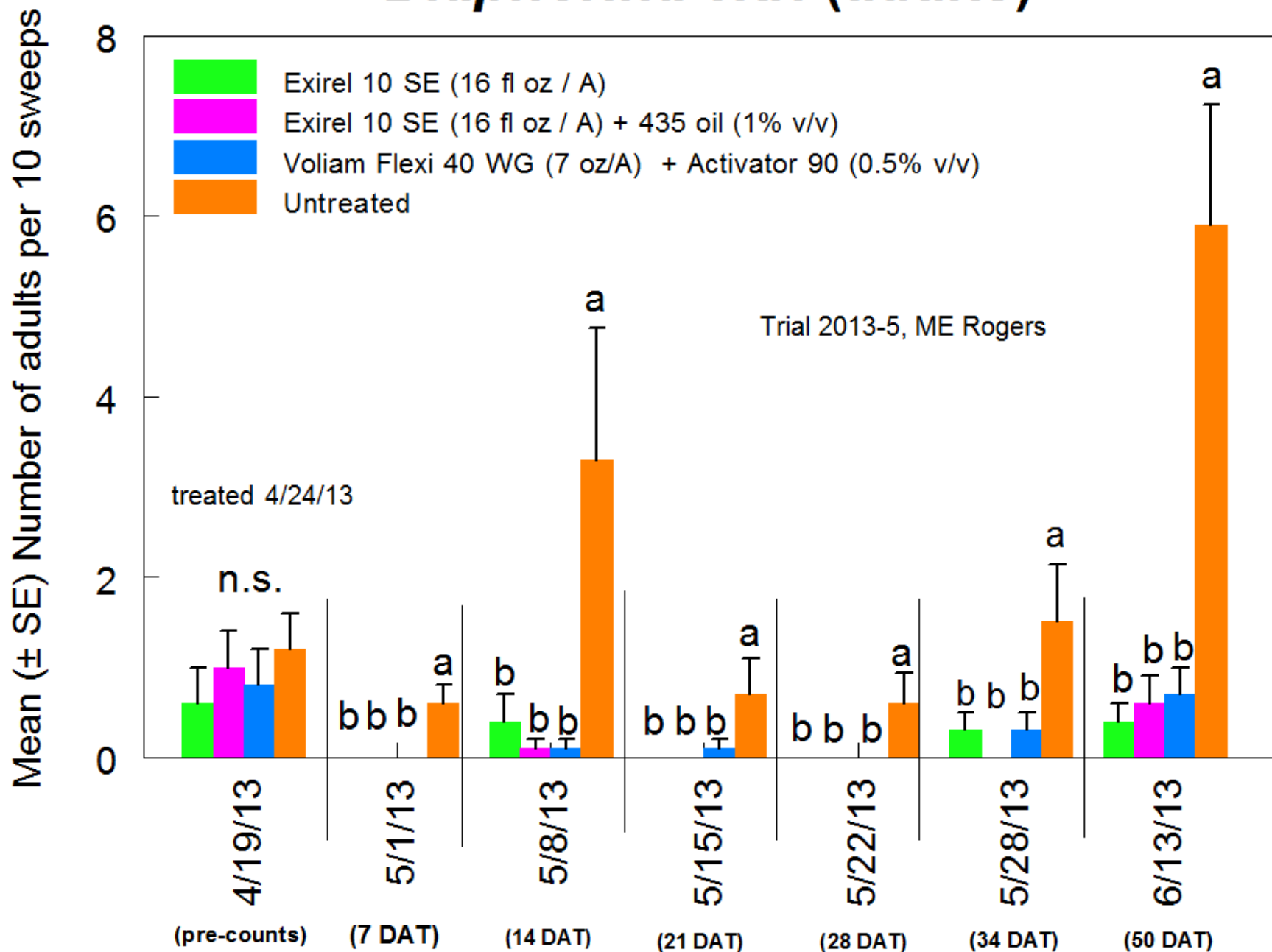
FIRST AID
IF ON SKIN: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.
For questions regarding emergency medical treatment, you may contact 1-800-441-3637 for information.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION! Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

PERSONAL PROTECTIVE EQUIPMENT
Applicators and other handlers must wear:
Long-sleeved shirt and long pants.
Chemical resistant gloves Category A (such as butyl rubber, natural rubber, neoprene rubber, or nitrile rubber), all > 14 mils.
Shoes plus socks.

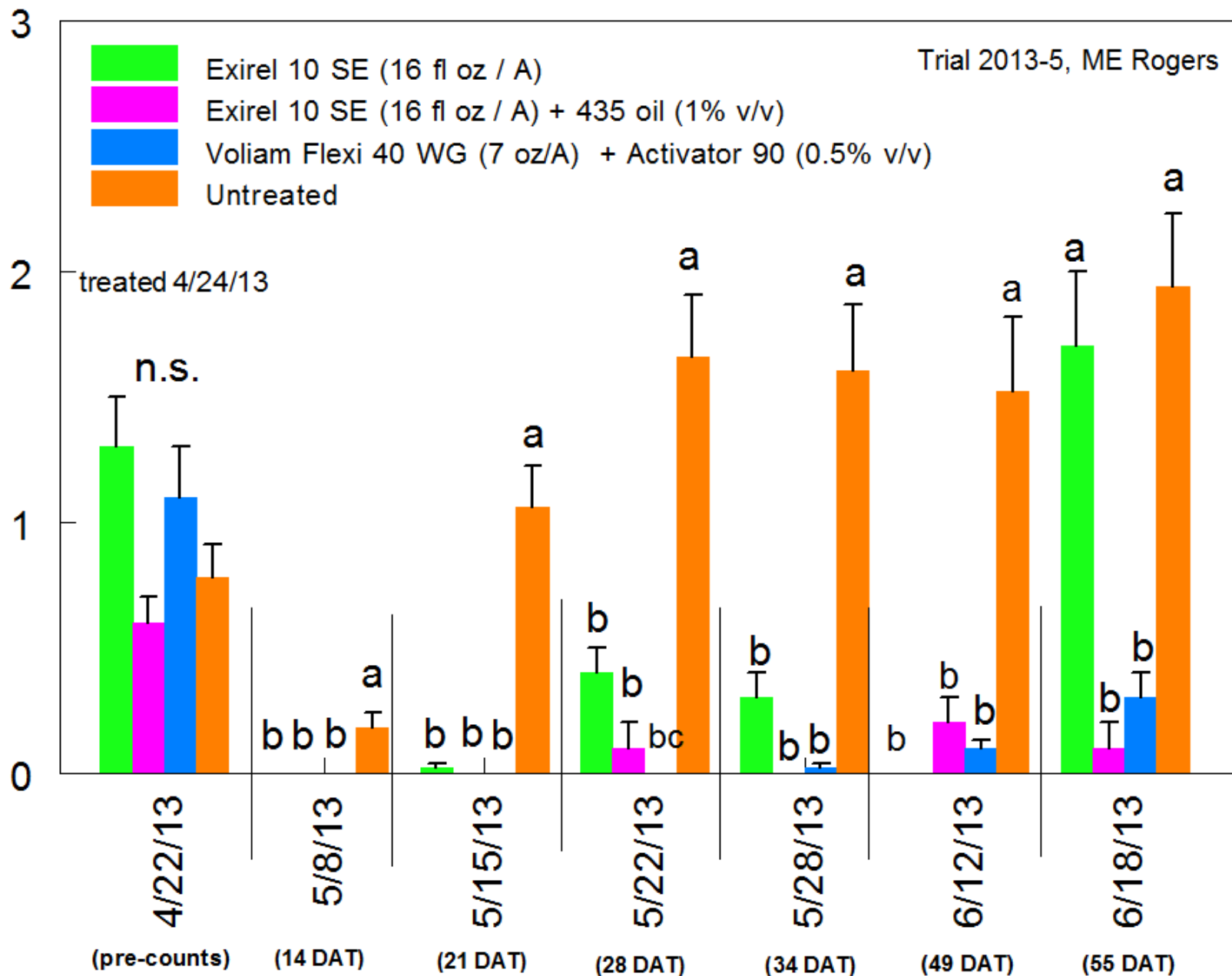
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Diaphorina citri (adults)



Diaphorina citri (nymphs)

Mean (\pm SE) psyllid nymph rating per 10 flushes



Leafminer Damage

Mean (\pm SE) percent leaf damage per 10 flushes

Trial 2013-5, ME Rogers

- Exirel 10 SE (16 fl oz / A)
- Exirel 10 SE (16 fl oz / A) + 435 oil (1% v/v)
- Voliam Flexi 40 WG (7 oz/A) + Activator 90 (0.5% v/v)
- Untreated

treated 4/24/13

n.s.

n.s.

4/22/13
(pre-counts)

5/1/13
(7 DAT)

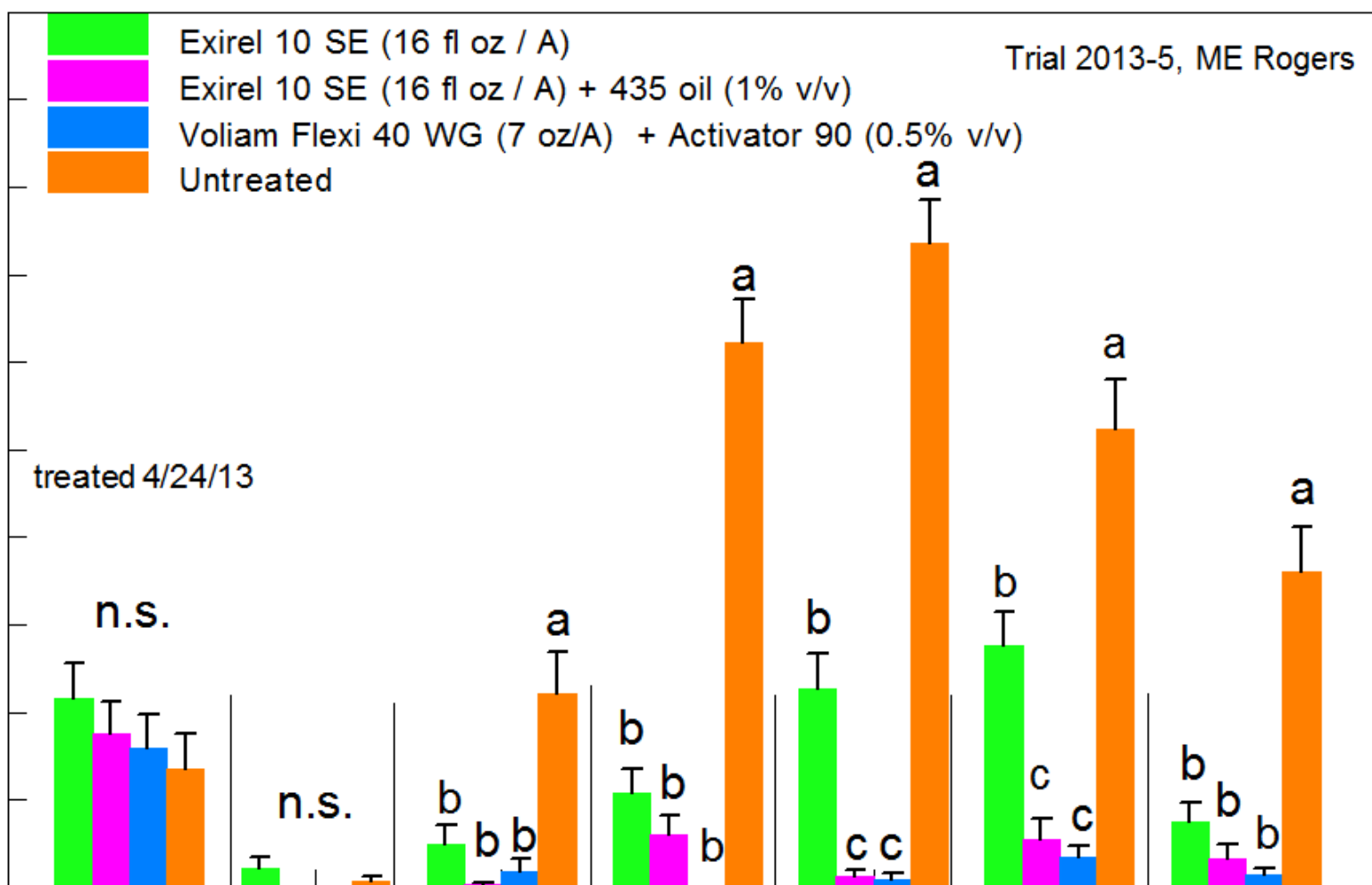
5/8/13
(14 DAT)

5/15/13
(21 DAT)

5/22/13
(28 DAT)

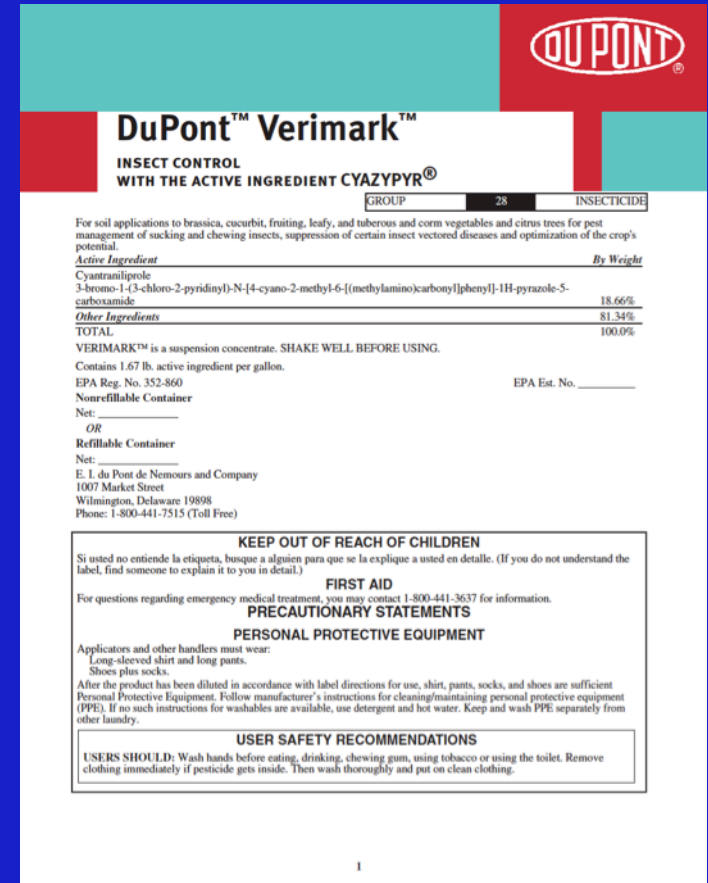
5/28/13
(34 DAT)

6/12/13
(49 DAT)



Verimark (cyazypyr)

- **Group 28 insecticide**
 - Soil-applied product
 - PHI: 1 day
 - REI: 12 hours
 - Citrus leafminer, Asian citrus psyllid
 - Controls populations of both psyllid adults and nymphs
 - **Slow acting; will not prevent pathogen transmission via feeding disruption**



The image shows a label for DuPont Verimark insecticide. The label features the DuPont logo in a red oval at the top right. Below it, the product name "DuPont™ Verimark™" is prominently displayed, followed by "INSECT CONTROL WITH THE ACTIVE INGREDIENT CYAZYPYR®". A small box indicates "GROUP 28 INSECTICIDE". The label contains detailed information about the active ingredient, other ingredients, and usage instructions. It also includes safety warnings such as "KEEP OUT OF REACH OF CHILDREN" and "FIRST AID" instructions. The label is designed with a white background and red and blue accents.

DUPONT

DuPont™ Verimark™
INSECT CONTROL
WITH THE ACTIVE INGREDIENT CYAZYPYR®

GROUP 28 INSECTICIDE

For soil applications to brassica, cucurbit, fruiting, leafy, and tuberous and corm vegetables and citrus trees for pest management of sucking and chewing insects, suppression of certain insect vectored diseases and optimization of the crop's potential.

Active Ingredient	By Weight
Cyazypyr	18.66%
3-bromo-1-(3-chloro-2-pyridinyl)-N-[4-cyano-2-methyl-6-[(methylamino)carbonyl]phenyl]-1H-pyrazole-5-carboxamide	81.34%
Other Ingredients	100.0%

TOTAL

VERIMARK™ is a suspension concentrate. SHAKE WELL BEFORE USING.
Contains 1.67 lb. active ingredient per gallon.
EPA Reg. No. 352-860
Nonrefillable Container
Net: _____ EPA Est. No. _____

OR

Refillable Container
Net: _____
E. I. du Pont de Nemours and Company
1007 Market Street
Wilmington, Delaware 19898
Phone: 1-800-441-7515 (Toll Free)

KEEP OUT OF REACH OF CHILDREN
Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID
For questions regarding emergency medical treatment, you may contact 1-800-441-3637 for information.

PRECAUTIONARY STATEMENTS

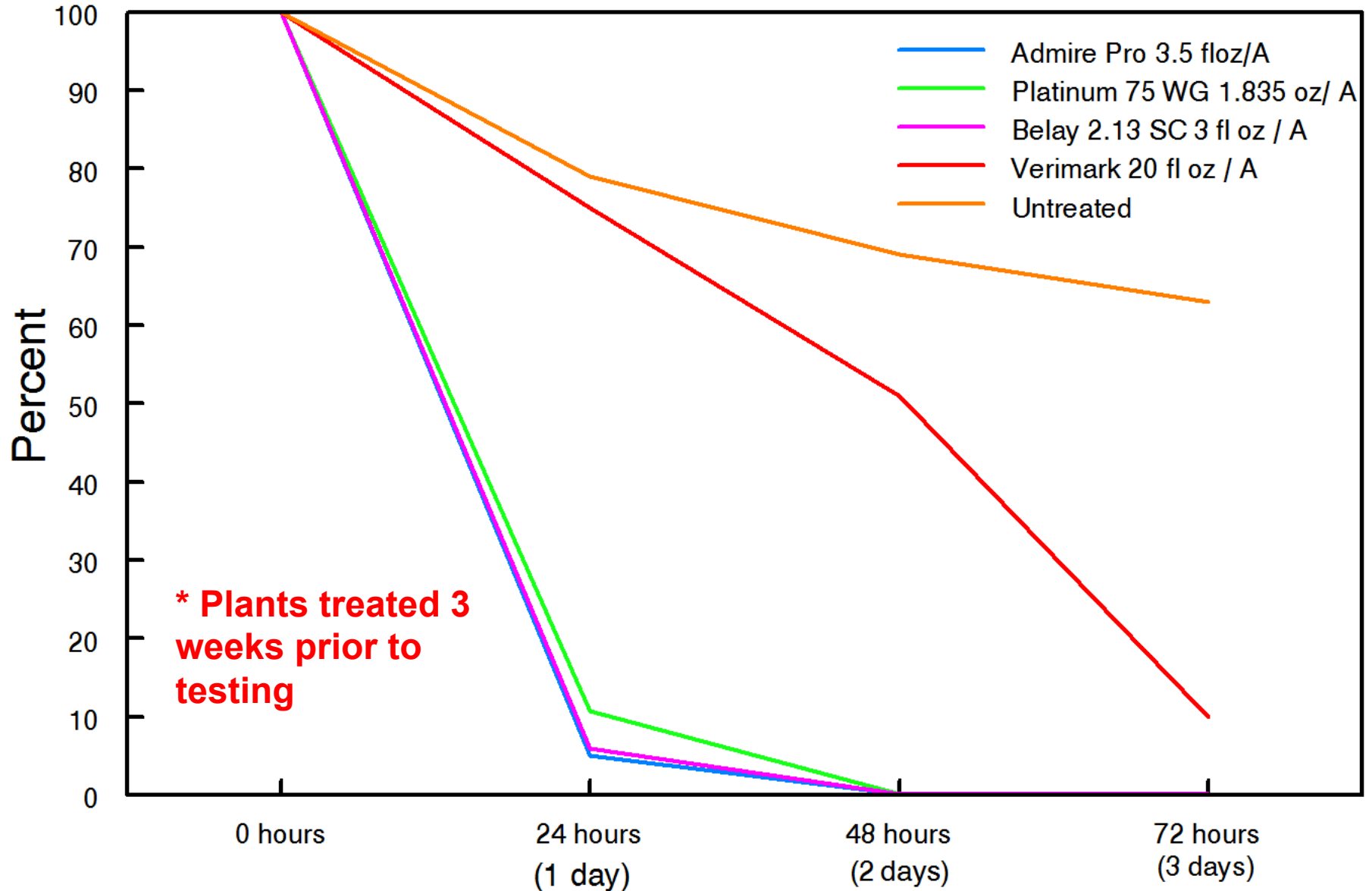
PERSONAL PROTECTIVE EQUIPMENT
Applicators and other handlers must wear:
Long-sleeved shirt and long pants.
Shoes plus socks.
After the product has been diluted in accordance with label directions for use, shirt, pants, socks, and shoes are sufficient Personal Protective Equipment. Follow manufacturer's instructions for cleaning/maintaining personal protective equipment (PPE). If no such instructions for washables are available, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS
USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

1

Adult Asian Citrus Psyllids

Percent Survival Following Treatment

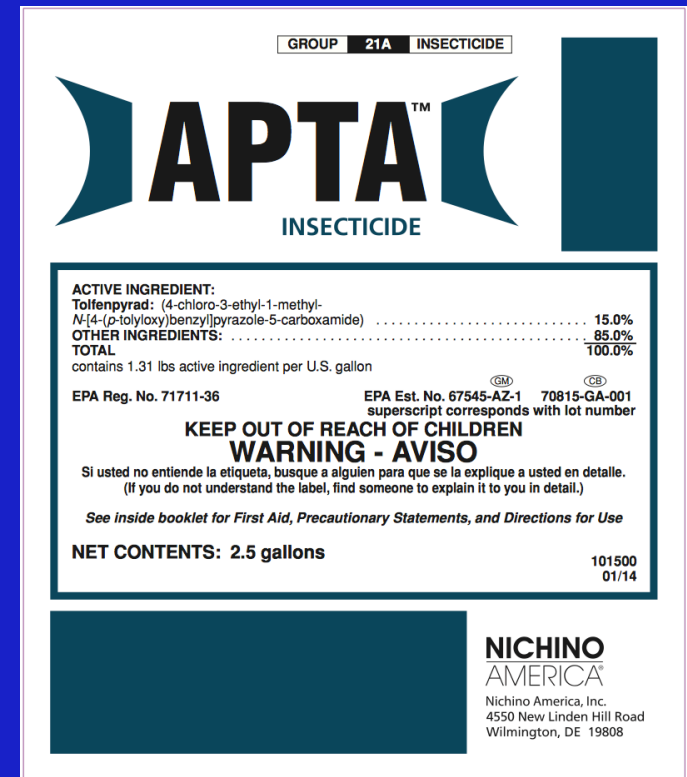


EPG Studies with Cyazypyr

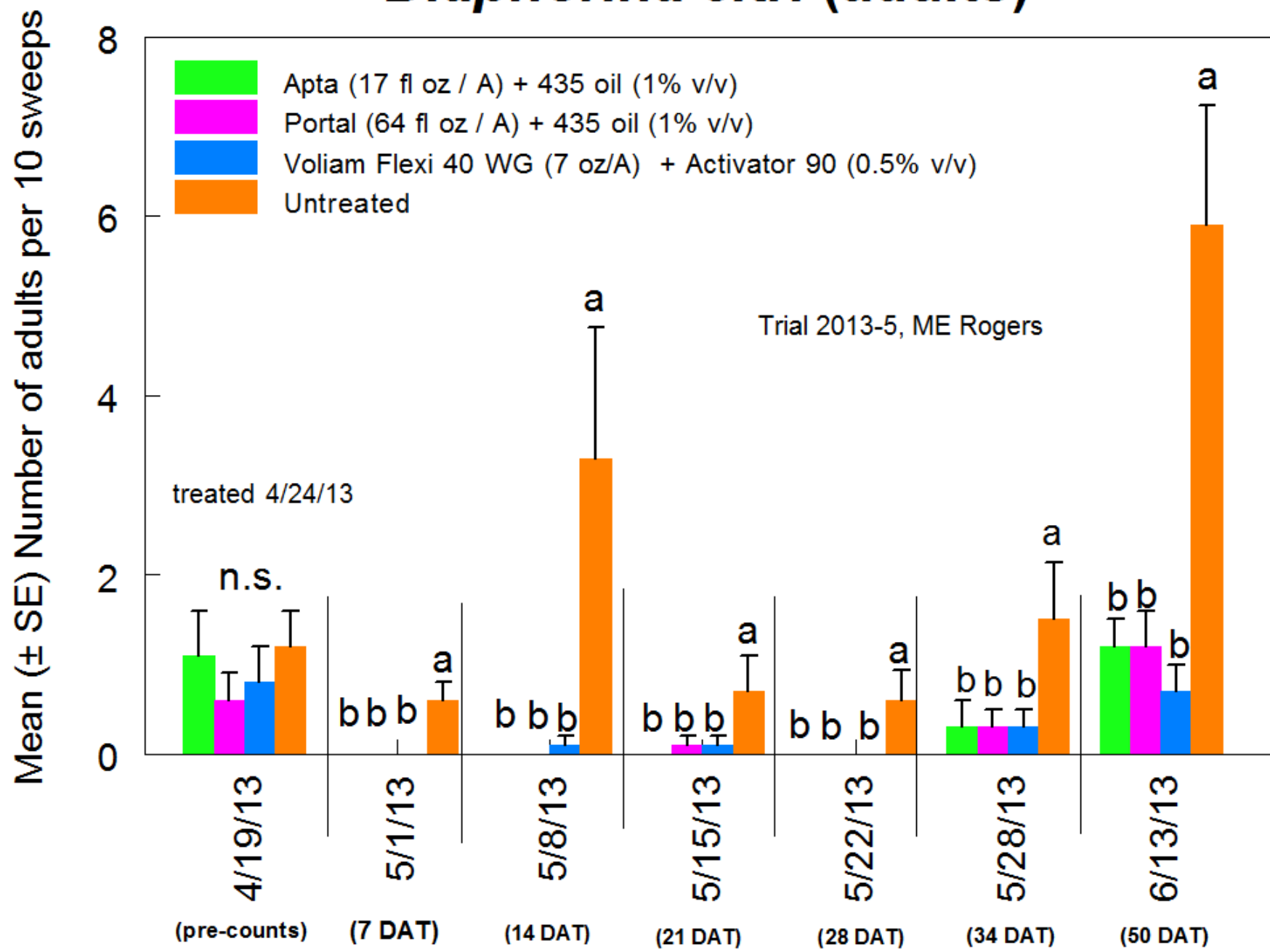
- **Foliar (Exirel) and soil (Verimark) applications of cyazypyr failed to prevent psyllid phloem feeding behaviors**
 - Independent studies by DuPont and UF/IFAS
- **Psyllids were still able to feed on phloem and potentially infect a tree prior to death from exposure to cyazypyr**
- **Verimark should not be used as a replacement for a soil application of neonicotinoids to young trees**
 - Imidacloprid, thiamethoxam, clothianidin

Apta Insecticide (Tolfenpyrad)

- **Group 21a insecticide**
 - Same MOA as Portal (fenpyroximate)
- **PHI: 14 days**
- **REI: 12 hours**
- **Target Pests:**
 - Asian citrus psyllid
 - Citrus rust mites?
 - Leafminer?

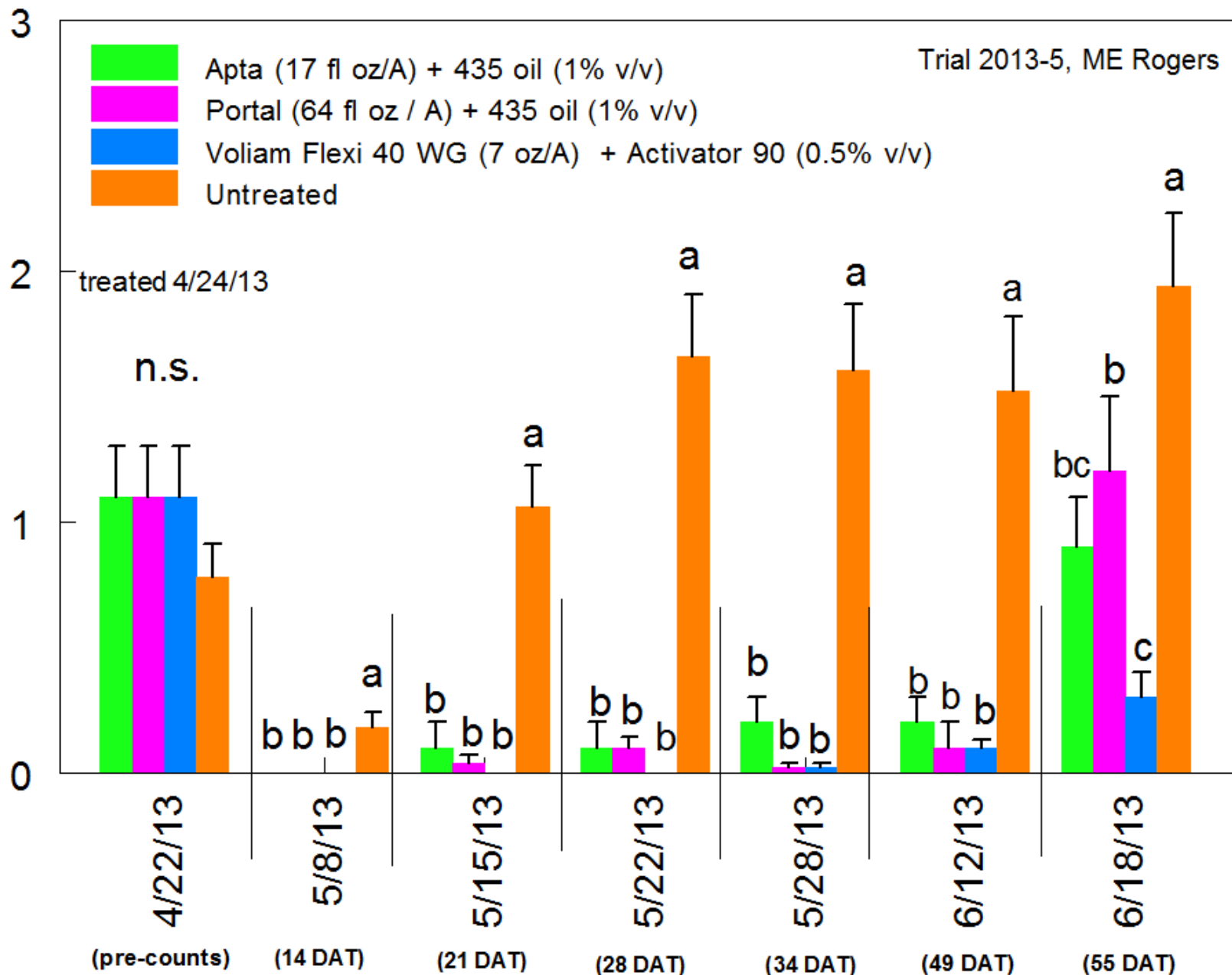


Diaphorina citri (adults)



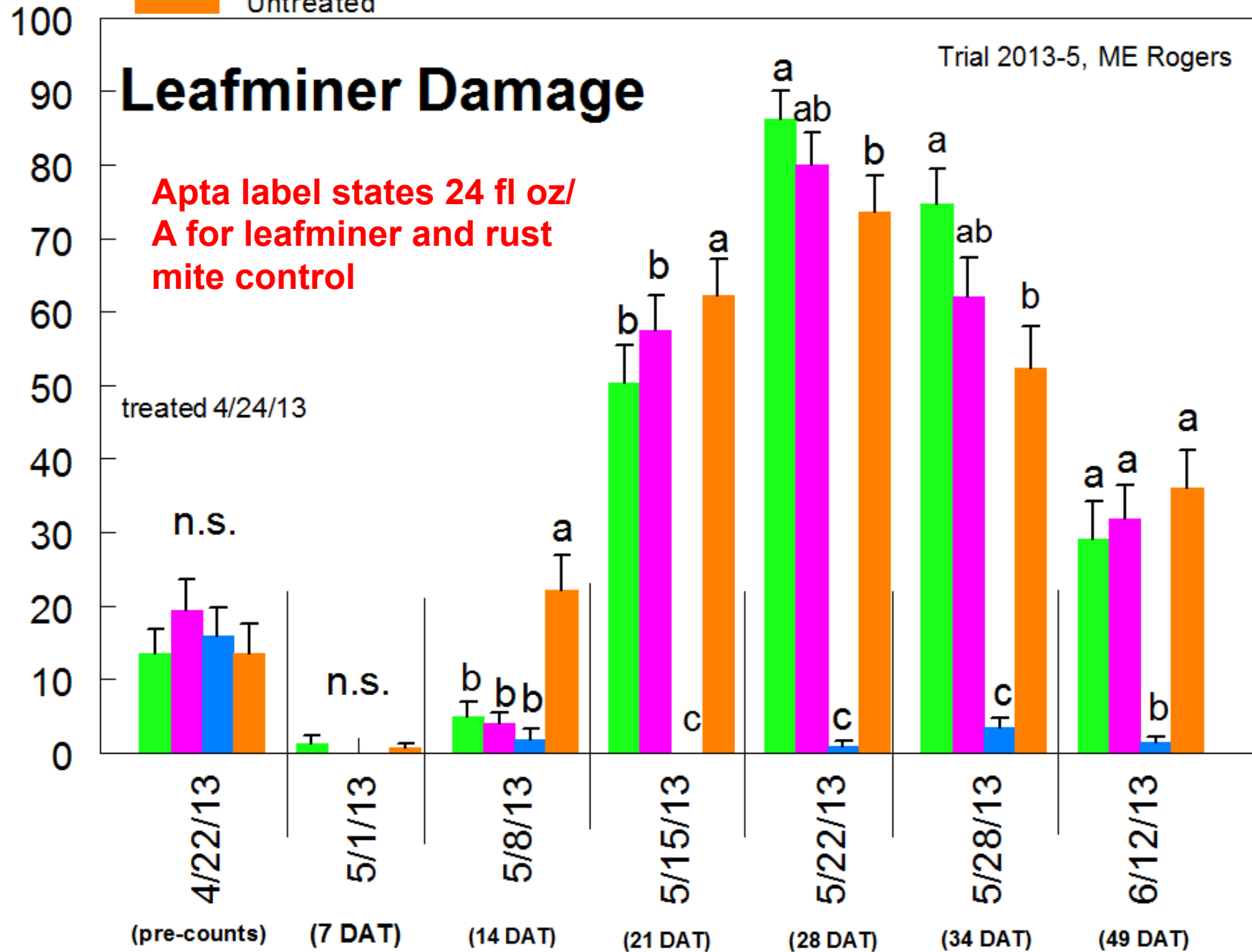
Diaphorina citri (nymphs)

Mean (\pm SE) psyllid nymph rating per 10 flushes



- Apta (17 fl oz / A) + 435 oil (1% v/v)
- Portal (64 fl oz / A) + 435 oil (1% v/v)
- Voliam Flexi 40 WG (7 oz/A) + Activator 90 (0.5% v/v)
- Untreated

Mean (\pm SE) percent leaf damage per 10 flushes



A close-up photograph of an orange tree branch. Several bright orange, round oranges are visible, some in sharp focus and others slightly blurred. The oranges are surrounded by lush green leaves. To the right, there are several white, five-petaled flowers with yellow centers, likely orange blossoms. The background is a soft-focus green, suggesting more foliage. A black rectangular box with the word "Questions?" in white text is centered over the middle of the image.

Questions?