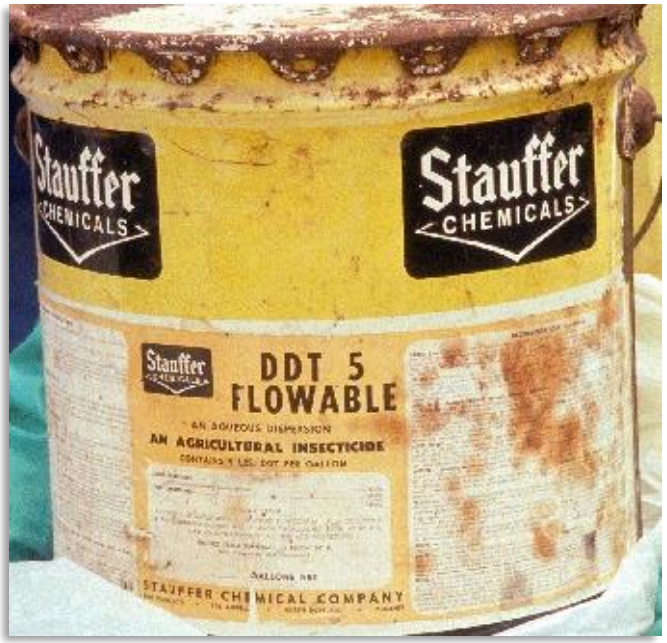
COLLEGE OF AGRICULTURE & LIFE SCIENCES
Arizona
Experiment Station
Yuma Agricultural Center

New Products for Insect Management On Produce and Melons

Early Synthetic Chemical Era

Organochlorines *DDT, Toxaphene*	**1945**
Organophosphates *Parathion, Lorsban*	**1946**
Carbamates *Sevin, Methomyl*	**1956**
Pyrethroids *Ambush, Pounce*	**1972**



Selective Products

B. thuringiensis **(1965)**
Formamidines (1979)
Avermectins (1986)

Broadly Toxic Insecticides

- Neurotoxins
- Contact / Stomach poisons
- Broad spectrum
- Effective at high rates (LAA)
- Persistent in environment

Modern Chemical Era: (*1993-present)*

Neonicotinoids
Admire, Venom

Spinosyns
Success, Radiant

Thiadiazines
Courier

Phenoxyphenols
Knack

Carboxamides
Beleaf, Carbine

Sulfoxamines
Sequoia

Semicarbazone
Alverde

Diacylhydrazines
Intrepid

Diamides
Coragen, Belt

Ketoenols
Movento

Pyrazols
Torac

Carboxylates
Acramite

Pyridines
Fulfill

Benzoylureas
Rimon

Pyridalyl
Tesoro

Oxadiazines
Avaunt

Chlorphenypyr
Alert

Ketoenols
Movento

Butenolides
Sivanto

Phenylpyrazoles
Regent

Reduced-risk Insecticides

- 20 New Chemical Classes
- Unique Modes of Action
- Selective Activity
- Lower toxicity to Beneficials
- Multiple Routes of Activity
- Low Impact on Human Health
- Environmentally Friendly
- Compatible with IPM

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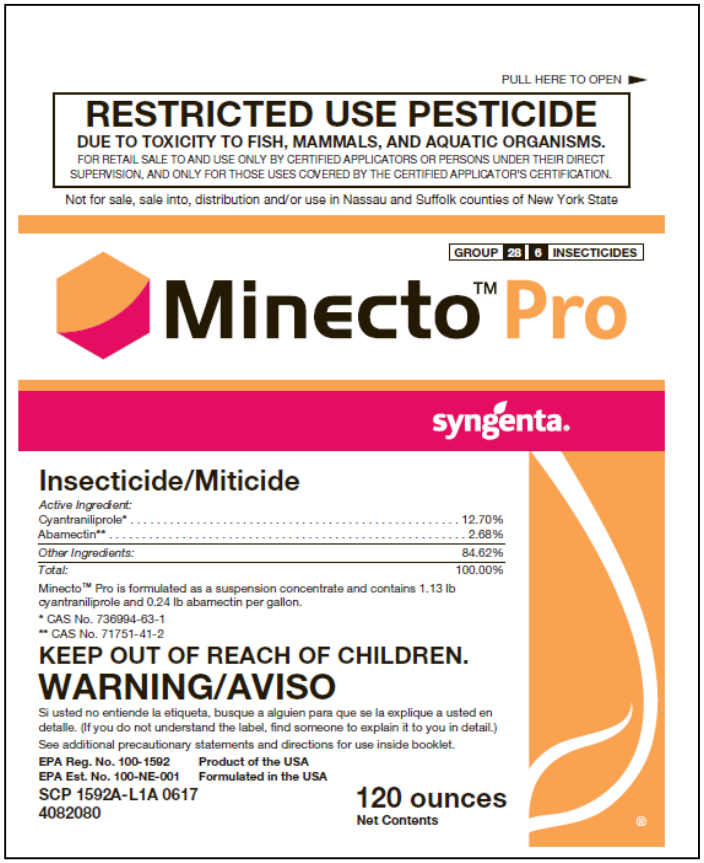
Minecto Pro *cyazapyr + abamectin*


PULL HERE TO OPEN

RESTRICTED USE PESTICIDE

DUE TO TOXICITY TO FISH, MAMMALS, AND AQUATIC ORGANISMS.

FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

Not for sale, sale into, distribution and/or use in Nassau and Suffolk counties of New York State

GROUP 28 6 INSECTICIDES

Minecto™ Pro

syngenta.

Insecticide/Miticide

Active Ingredient:	
Cyantraniliprole*	12.70%
Abamectin**	2.68%
Other Ingredients:	84.62%
Total:	100.00%

Minecto™ Pro is formulated as a suspension concentrate and contains 1.13 lb cyantraniliprole and 0.24 lb abamectin per gallon.

* CAS No. 736994-63-1

** CAS No. 71751-41-2

KEEP OUT OF REACH OF CHILDREN.

WARNING/AVISO

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.)

See additional precautionary statements and directions for use inside booklet.

EPA Reg. No. 100-1592 Product of the USA

EPA Est. No. 100-NE-001 Formulated in the USA

SCP 1592A-L1A 0617

4082080

120 ounces

Net Contents

Suspension concentrate

Chemistry

- **Antranillic Diamide + Avermectin**
- **IRAC group – 28 + 6**

Mode of Action

- **Rynaodine receptor modulator**
- **Chloride channel activator**

Route of Activity

- **Translaminar / ingestion**
- *(neither has much contact activity)*

Effective Spectrum

- **Worms, Whiteflies, Leafminers**

X Rate:

- **10 oz**

Key Crops:

- ***Leafy Vegetables and Melons***

13.5 oz

16 oz/ac

Lepidopterous Larvae in Desert Lettuce

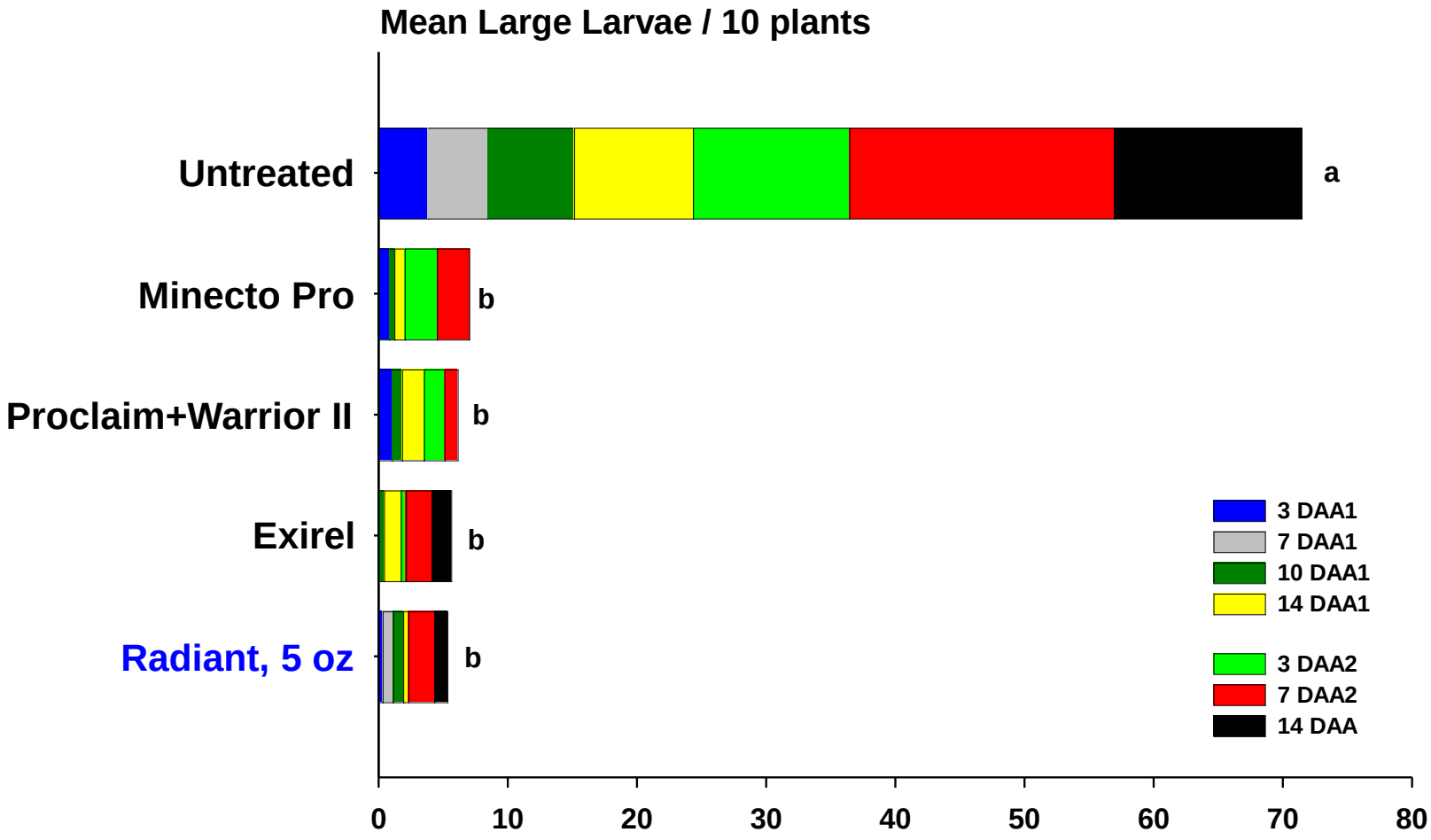
Yuma Ag Center, Fall 2017

Treatment	Rate
Minecto Pro	*10 oz*
Exirel	*13.5 oz*
Proclaim + Warrior	*4.0 + 1.9 oz*
Radiant	*5 oz*
UTC	-

- **2 sprays** (14 d spray intervals)
- Dyne-Amic applied @ 0.125 vol/vol
- 22.5 gpa @ 50 psi
- Assessments: 3, 7, 10, 14 DAA

Lep Larvae in Desert Lettuce

Yuma Ag Center, Fall 2017



Whitefly Adult /CYSDV Efficacy with New Foliar Alternatives

Summer 2017

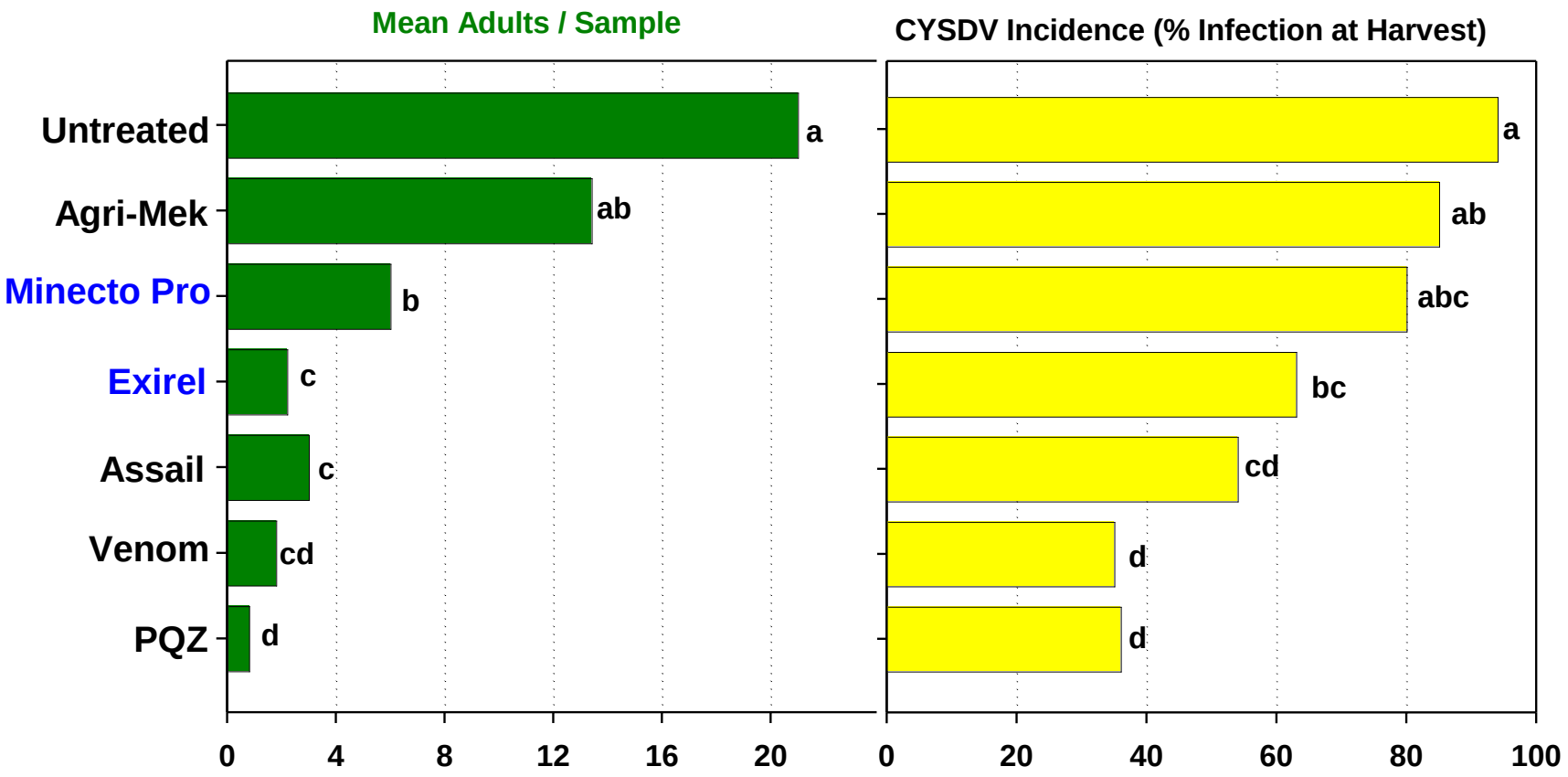
Treatment	Rate
Minecto Pro	10 oz
Agri-Mek SC	3.5 oz
→ Exirel	20 oz
Assail	5.3 oz
Venom	4.0 oz
PQZ	3.2 oz
Untreated	-

- **3 sprays** (7-8 d spray intervals)
- 23.5 gpa @ 50 psi
- Assessments: 1, 3, 7 DAA

*** No soil insecticide (Venom or Sivanto) applied**

Whitefly Adult /CYSDV Efficacy with New Foliar Alternatives

Fall 2017



Thrips Control in Spring Romaine

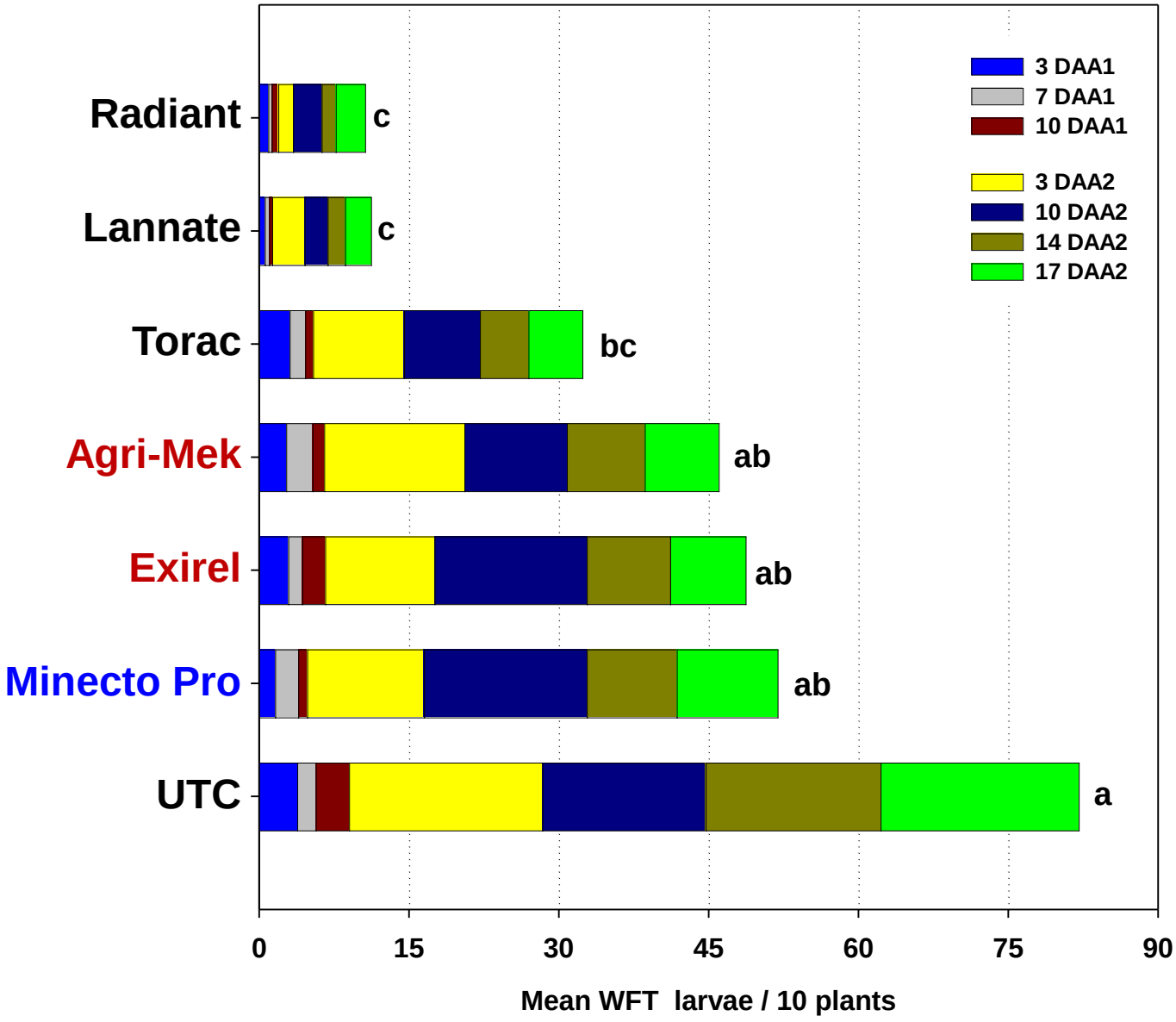
Yuma Ag Center, Fall 2017

Treatment	Rate
Minecto Pro	10 oz
Exirel	13.5 oz
Agri-Mek SC	3.5 oz
Torac	21 oz
Lannate	1 lb
Radiant	7 oz
UTC	-

- **2 sprays** (12 d spray intervals)
- Dyne-Amic applied @ 0.125 vol/vol
- 22.5 gpa @ 50 psi
- Assessments: 3, 7, 10, 14 DAA

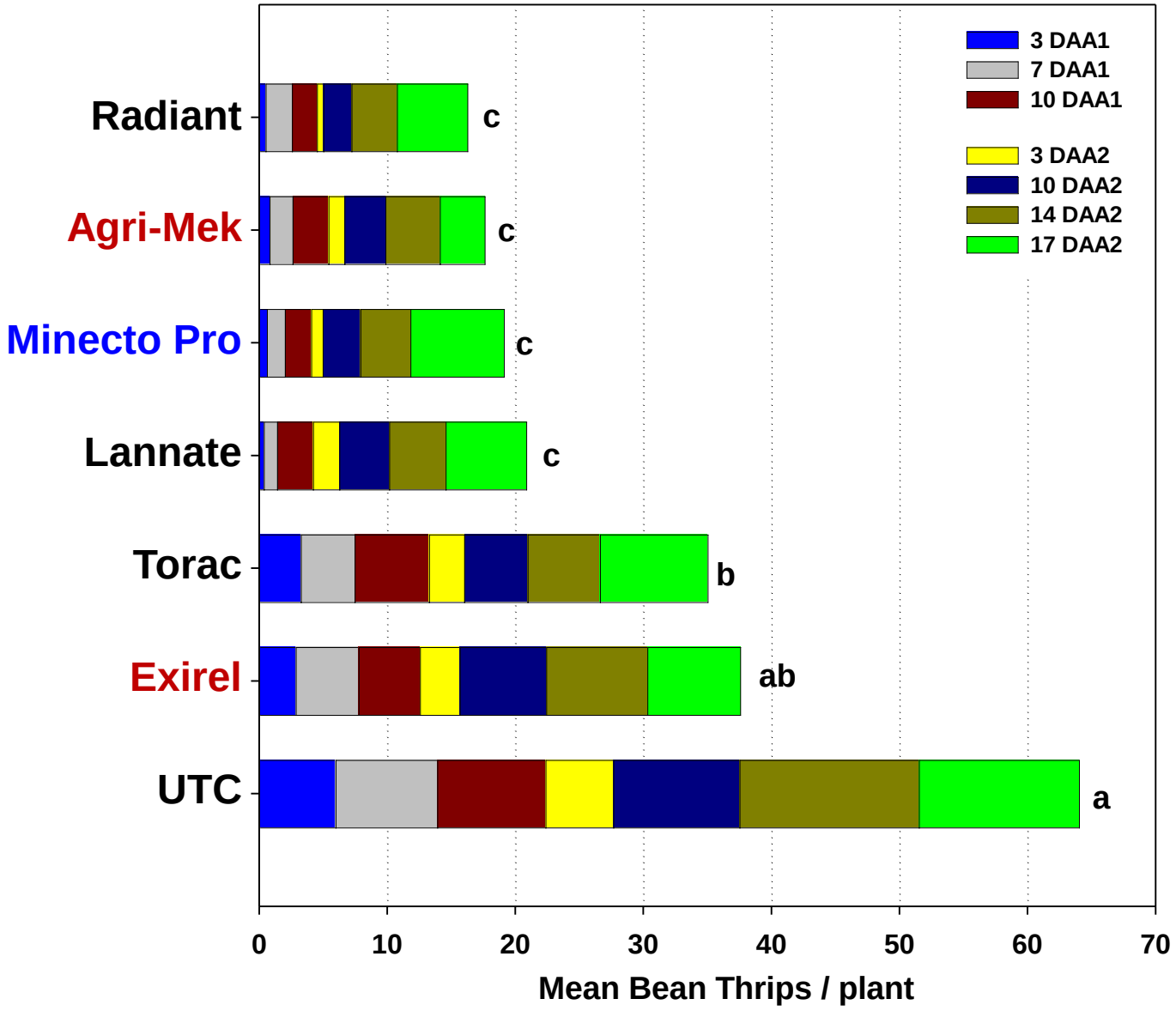
WFT Control in Fall Romaine

Yuma Ag Center, Fall 2017



Bean Thrips Control in Fall Romaine

Yuma Ag Center, Fall 2017



Minecto Pro *cyazapyr + abamectin*

Chewing / Sucking Insects

Pest	IPM Standards	Comparative Efficacy
Worms	Radiant, Coragen	**A**
Whiteflies –Nymphs	Exirel, Movento	**A**
Whiteflies – Adults/ *CYSDV*	Venom, Exirel	**B**
Leafminers	Radiant, Exirel	**A**
Aphids	Movento	**B**
Thrips	Radiant, Lannate	**B**

A	**As good as** the standard
B	**Not as good as** the standard
C	**Not economically effective**

Cormoran *Novaluraon + acetamiprid*

Dispersible concentrate

Chemistry

- **Benzoylurea + Neonicotinoid**
- **IRAC group – 15 + 4A**

Mode of Action

- **Chitin synthesis inhibitor**
- **Nicotinic AchE agonist**

Route of Activity

- **Translaminar / ingestion**
- **Contact** (acetamiprid)

Effective Spectrum

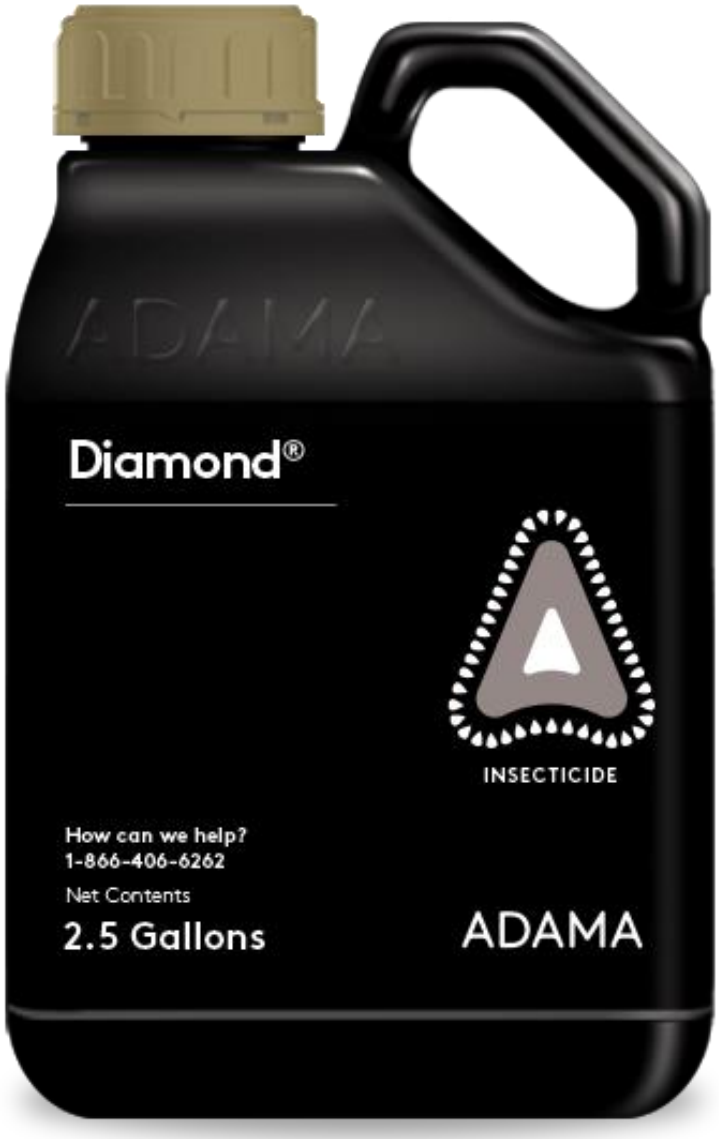
- **Worms, Whiteflies, Lygus**

X Rate:

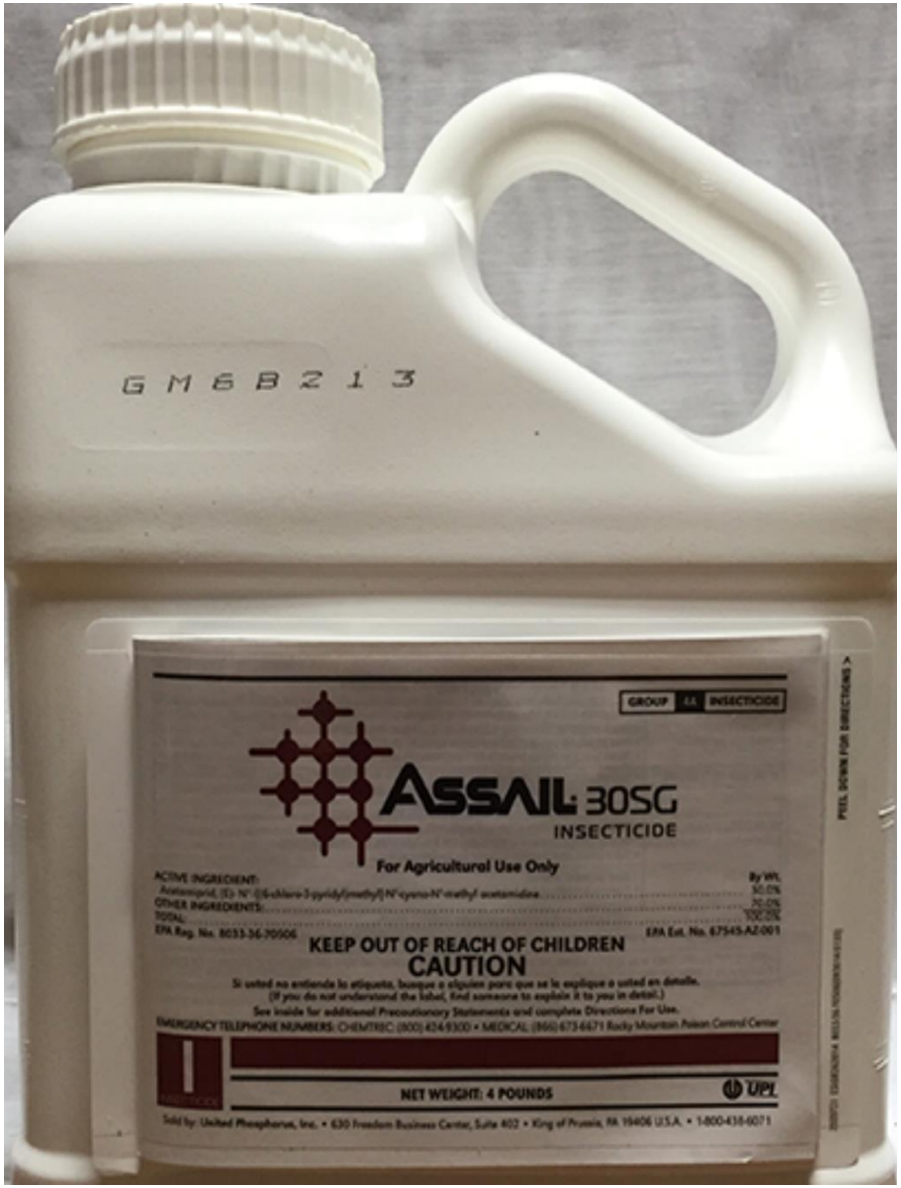
- **12 oz**

Key Crops:

- **Brassica Crops and Melons**



12 oz



3.3 oz

Dispersible concentrate

Insecticide Efficacy I - DBM in Broccoli

October 2017

Yuma Ag Center

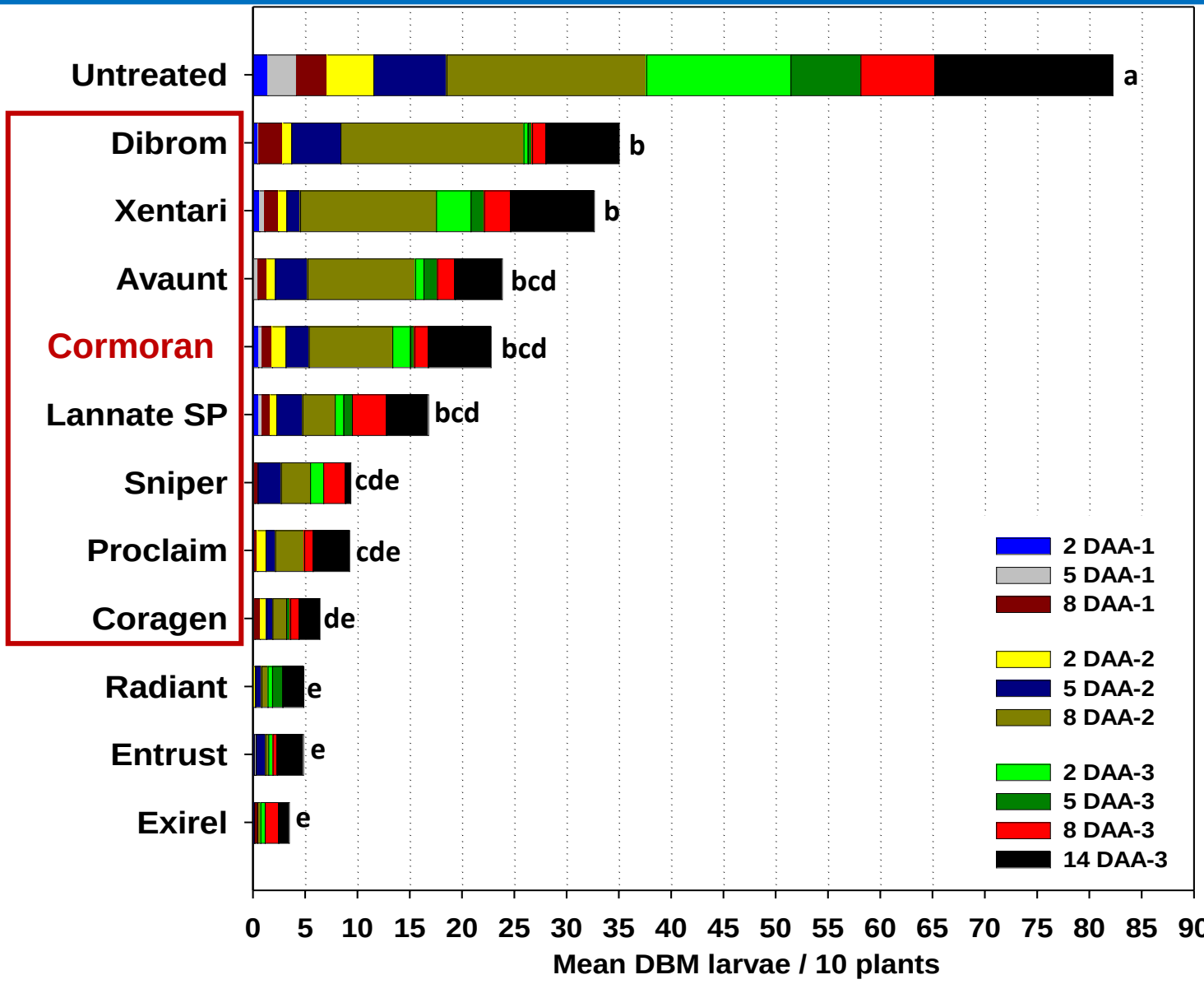
- **3 applications**
- **10 day spray interval**
- **23.5 gpa@50 psi**
- **Sampled: 2, 5 and 8 DAA**

Treatment	Rate/ac
Radiant	5 oz
Proclaim	4.8 oz
Lannate SP	1 lb
Sniper	5 oz
Coragen	5 oz
Exirel	15.0 oz
Avaunt	3.5 oz
Dibrom	1.5 pt
Cormoran	12 oz
Entrust	5 oz
Xentari	1.5 lb
Check	-

Insecticide Efficacy DBM in Broccoli

October 2017

Yuma Ag Center



Cross-Spectrum Activity in Broccoli

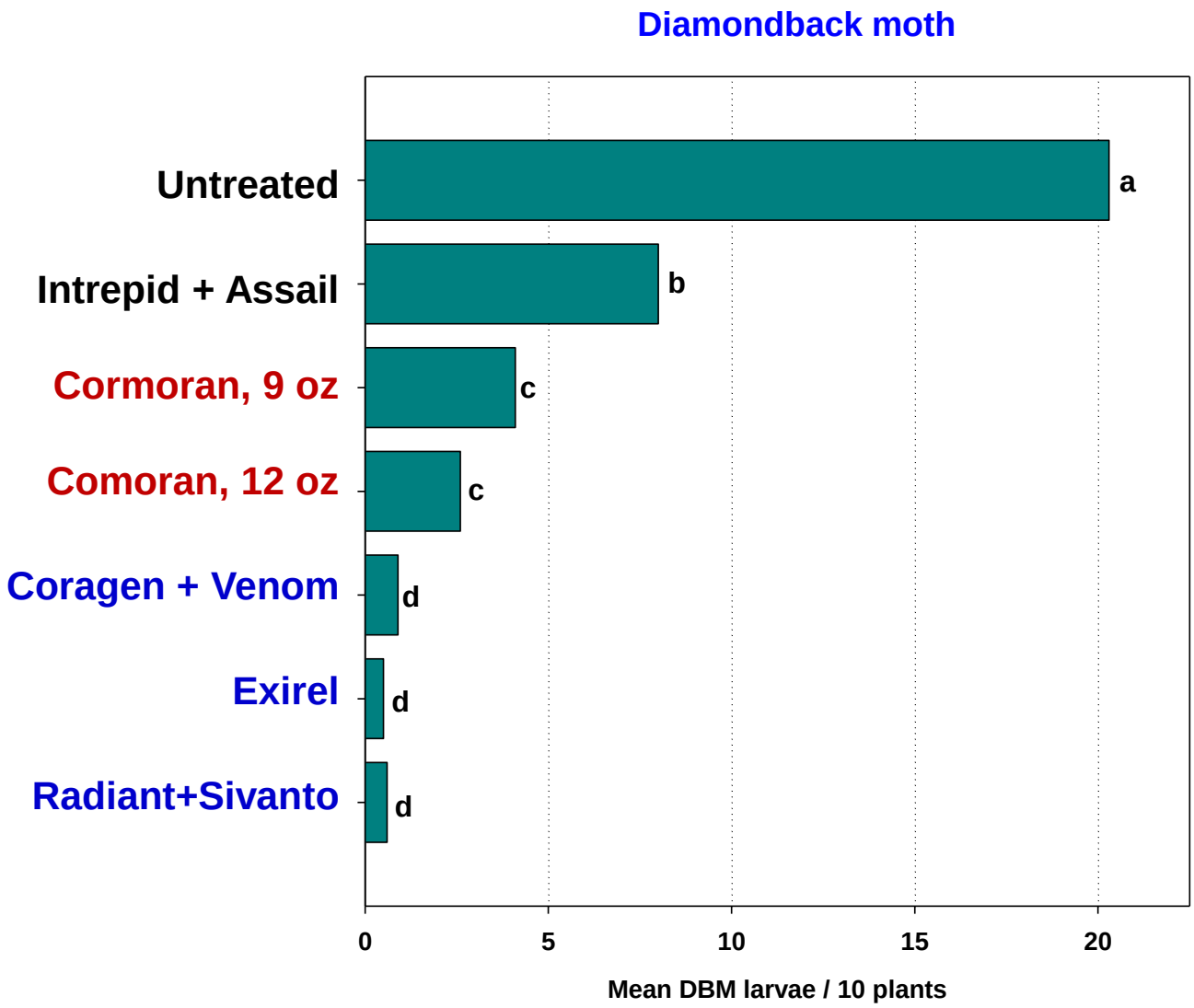
Yuma Ag Center, Fall 2017

Treatment	Rate/ac
Cormoran	12 oz
Cormoran	9 oz
Intrepid + Assail	16 oz + 4 oz
Radiant + Sivanto	5 + 10.5 oz
Coragen + Venom	5 + 4 oz
Exirel	16 oz
Untreated	-

- 2 applications
- 10 day spray interval
- 23.5 gpa@50 psi
- Sampled: 3,7 and 14 DAA

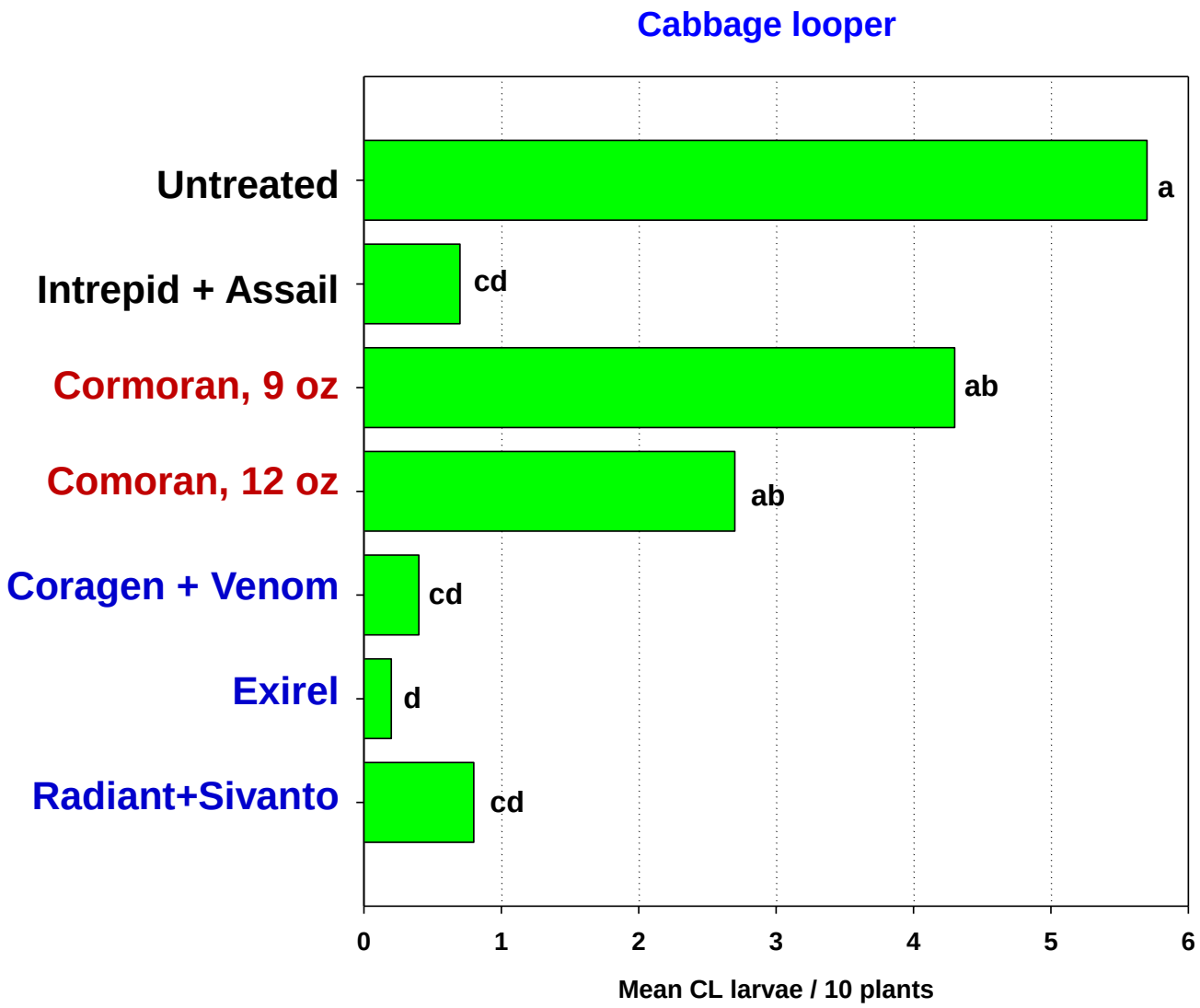
Cross-Spectrum Activity in Broccoli

Yuma Ag Center, Fall 2017



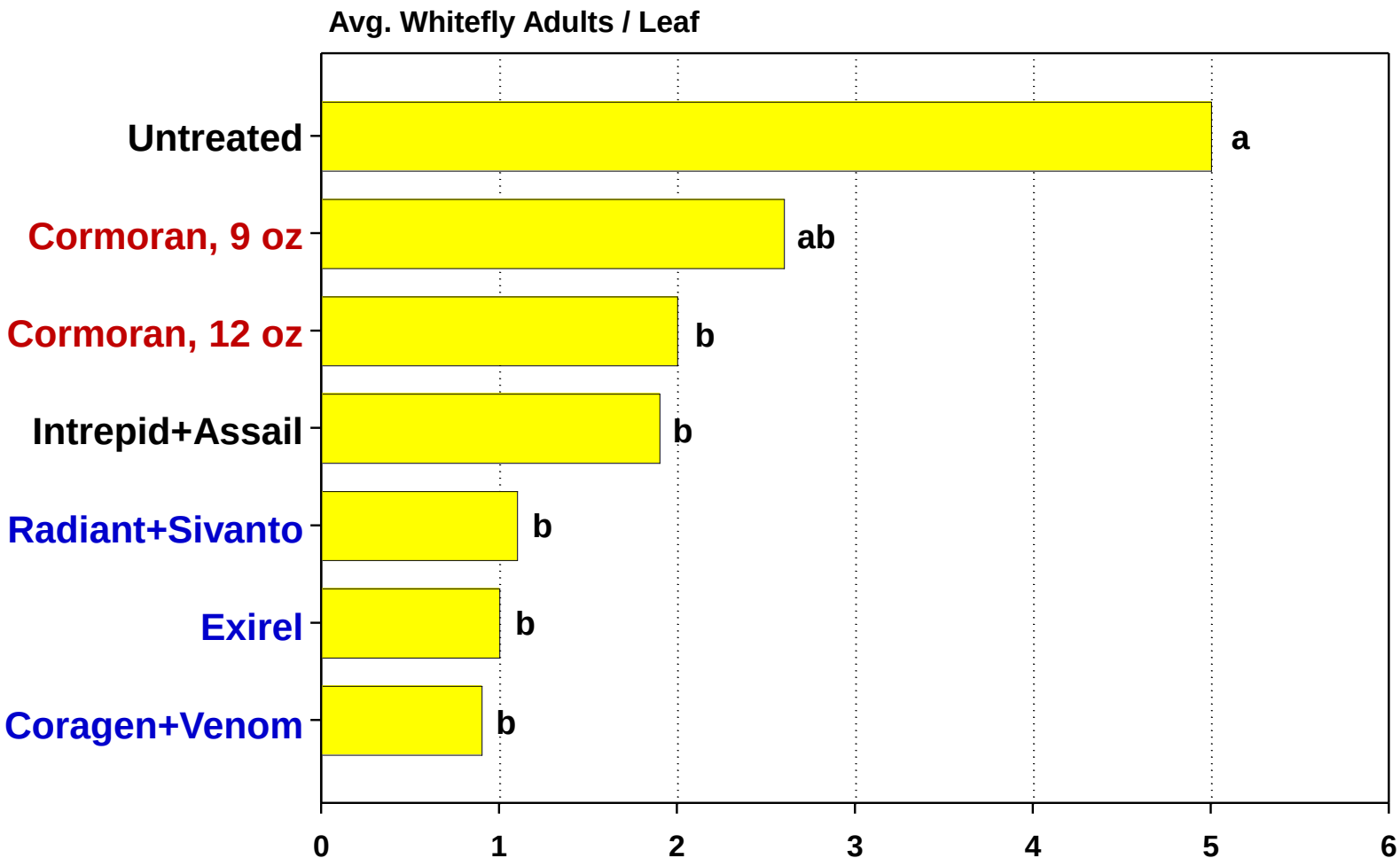
Cross-Spectrum Activity in Broccoli

Yuma Ag Center, Fall 2017



Cross-Spectrum Activity in Broccoli

Yuma Ag Center, Fall 2017



Whitefly Efficacy with Cormoran on Cantaloupes

Spring 2018

Treatment	IRAC group	Rate/ac
Cormoran	*15*	12 oz
Assail	*4A*	5.3 oz
PQZ	*9B*	3.2 oz
Exirel	*28*	20.0 oz
Venom	*4A*	4 oz
Non-treated	-	-

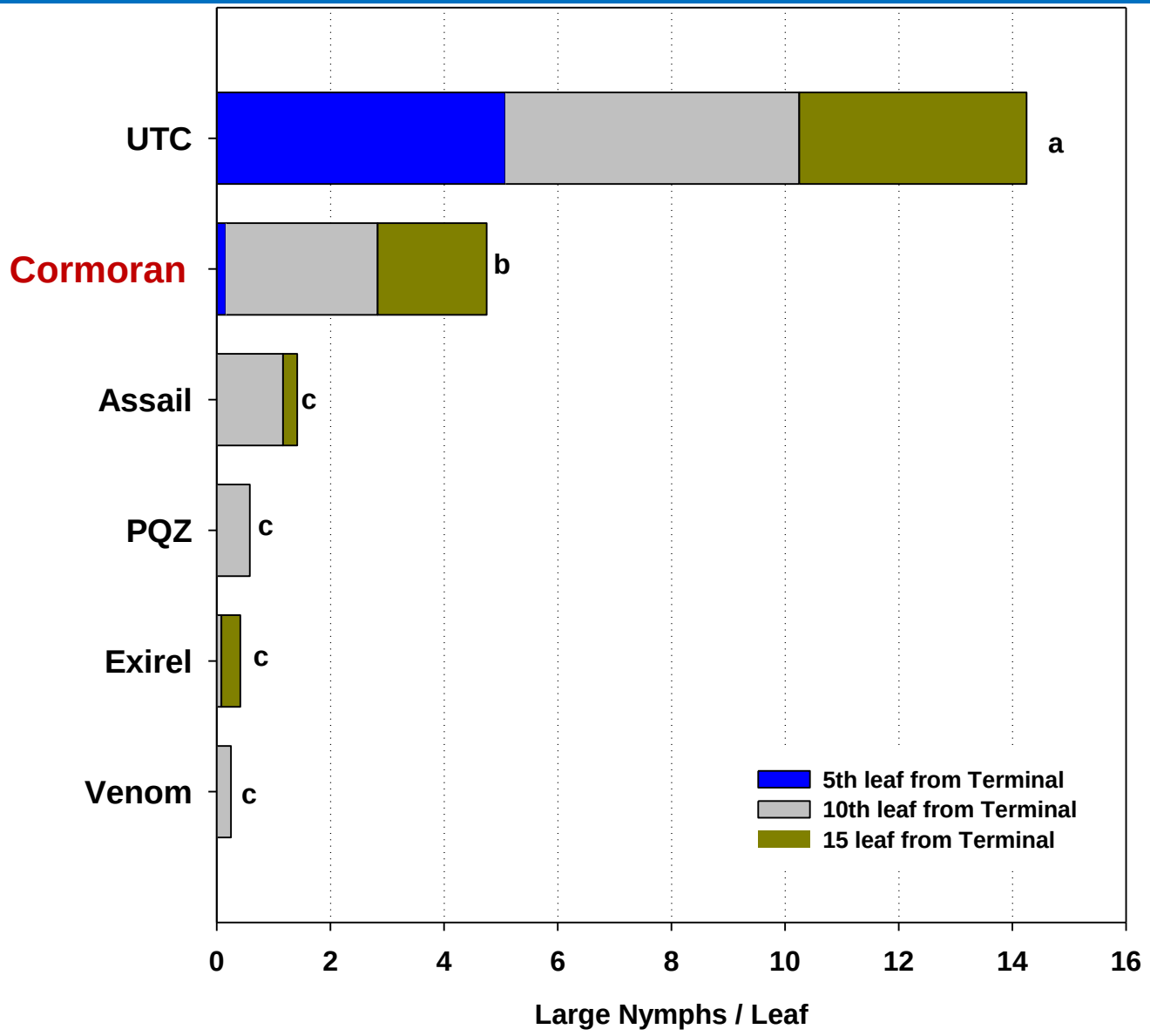
- 3 applications
- 7-8 day spray interval
- 23.5 gpa@50 psi

*** No soil insecticide (Venom or Sivanto) applied**

Whitefly Efficacy with Cormoran on Cantaloupes

Spring 2018

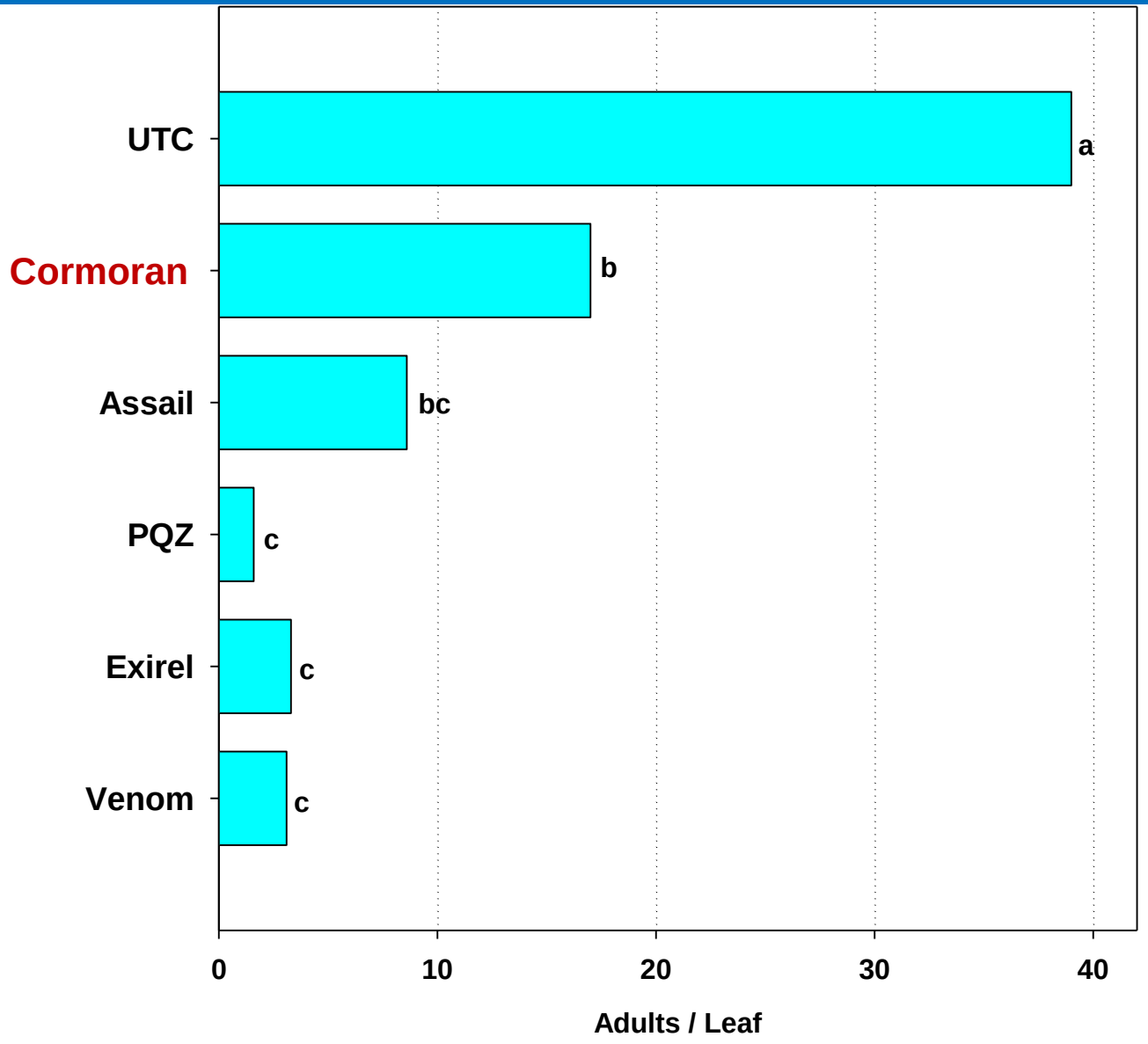
14 DAA-3



Whitefly Efficacy with Cormoran on Cantaloupes

Spring 2018

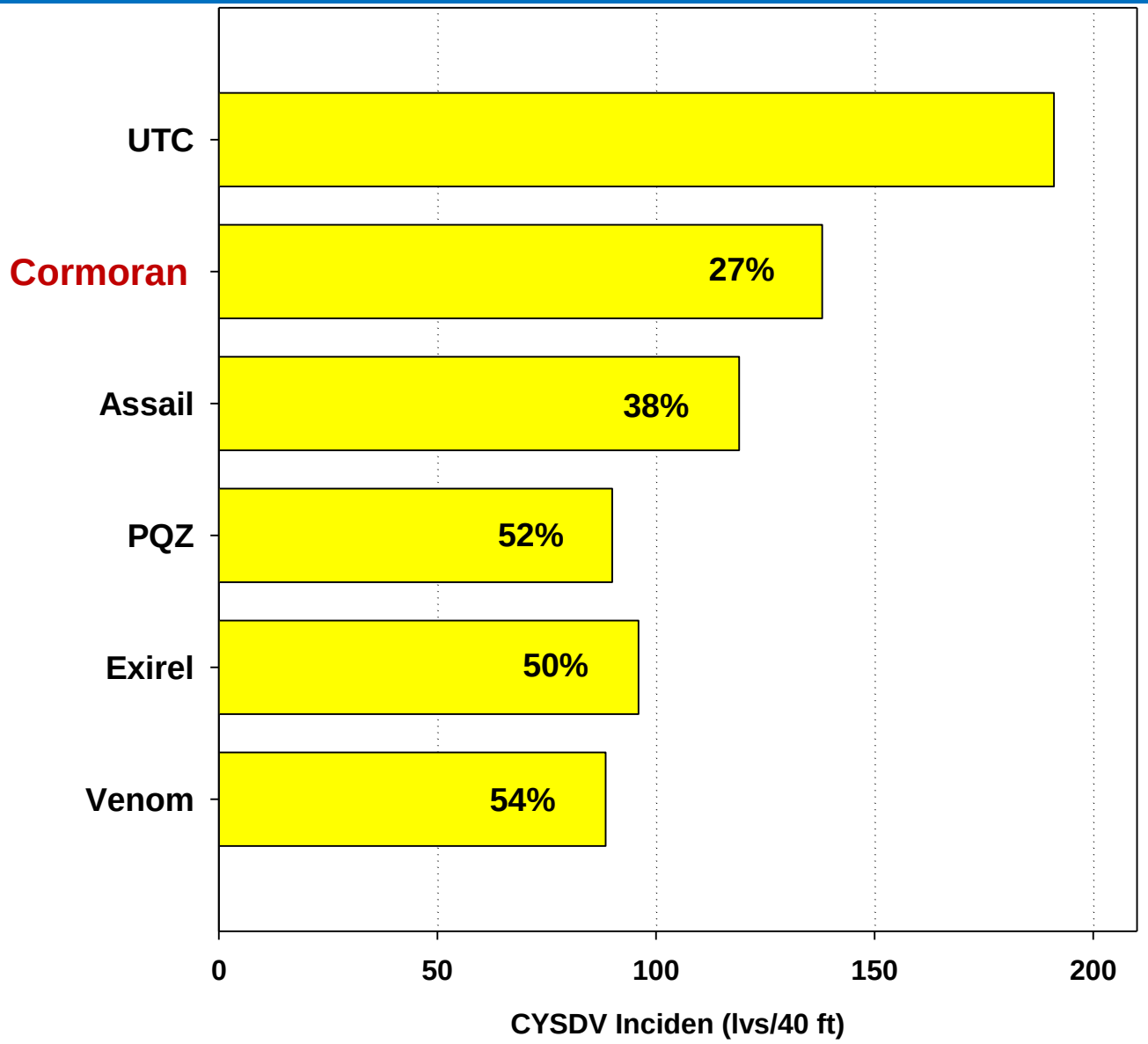
Trial Avg.



Whitefly Efficacy with Cormoran on Cantaloupes

Spring 2018

14 DAA-3



Cormoran *Novaluraon + acetamiprid*

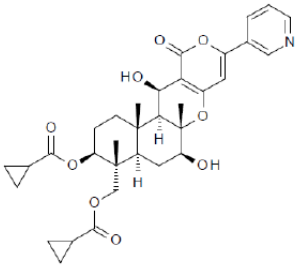
Sucking Insects

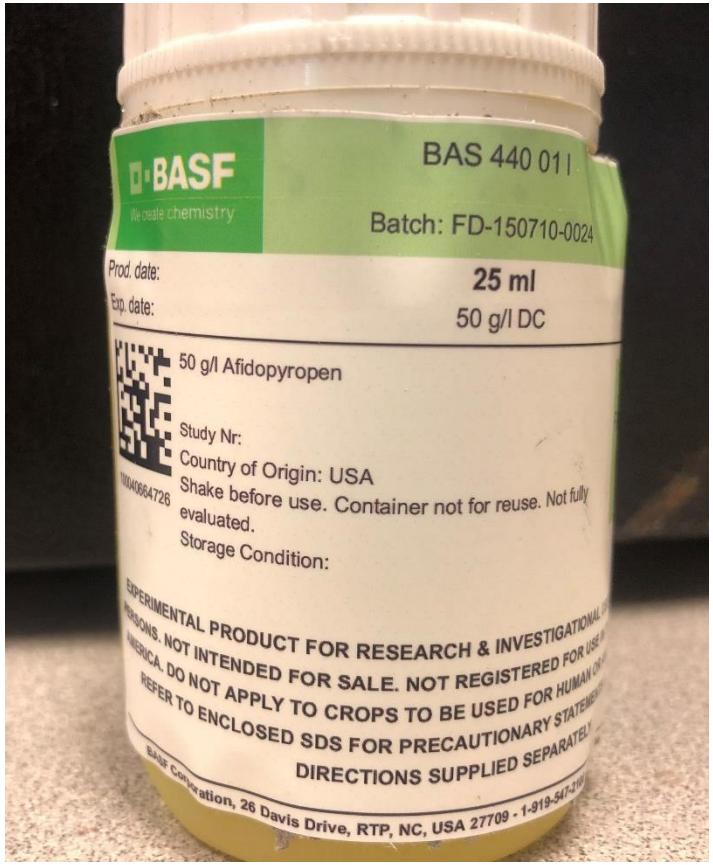
Pest	IPM Standards	Comparative Efficacy
Whiteflies –Nymphs	Exirel, Movento	**B**
Whiteflies – Adults/ *CYSDV*	Venom, Exirel	**B**
Worms	Radiant, Exirel	**B**
Lygus	Beleaf, Sequoia	**?**

A	**As good as** the standard
B	**Not as good as** the standard
C	**Not economically effective**

Versys, Sefina

Inscalis, *afidopyropen, BAS440*





*** New effective MOA for Sucking Insects**

Chemistry

- **Pyropenes**
- **IRAC group – 9D**

Mode of Action

- **Chordotonal TRPV channel modulator** *(disrupts feeding behavior)*

Route of Activity

- **Translaminar / ingestion**

Effective Spectrum

- **Aphids, whitefly**

X Rate:

- **Versys**: *1.5 oz*
- **Sefina**: *7 oz*

Key Crops:

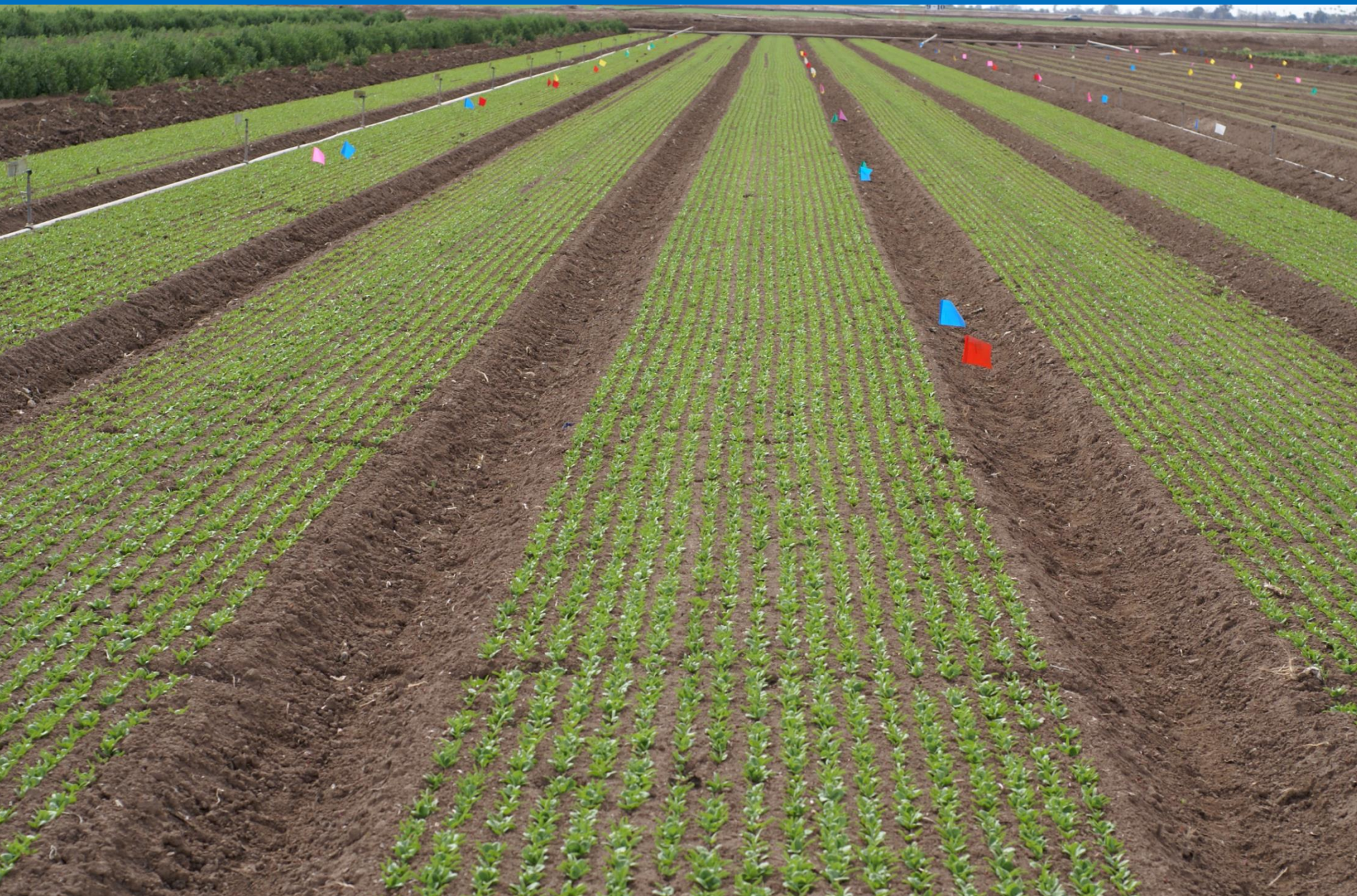
- **Versys**: *Leafy and Brassica Veg*
- **Sefina**: *Melons, Cotton*

Versys, Sefina

Inscalis, *afidopyropen, BAS440*

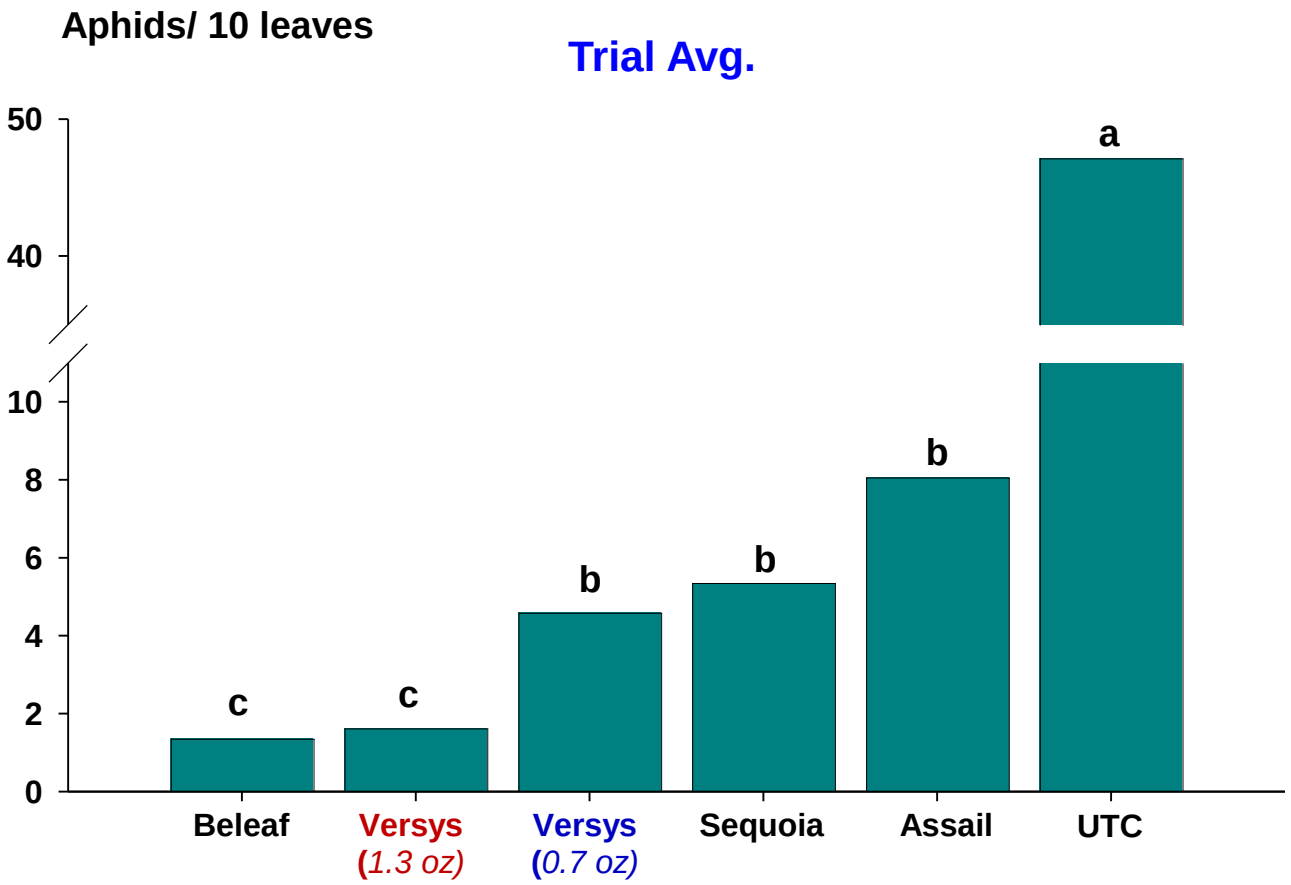
0.83 and 1.67 lb AI/gal Dispersible Concentrate

Green Peach Aphid in Baby Spinach



Green Peach Aphid Control in Baby Spinach: Versys

Yuma Ag Center, Spring 2015



- 2 applications
- 14 day spray interval
- 25 gpa@50 psi
- *No adjuvants used*

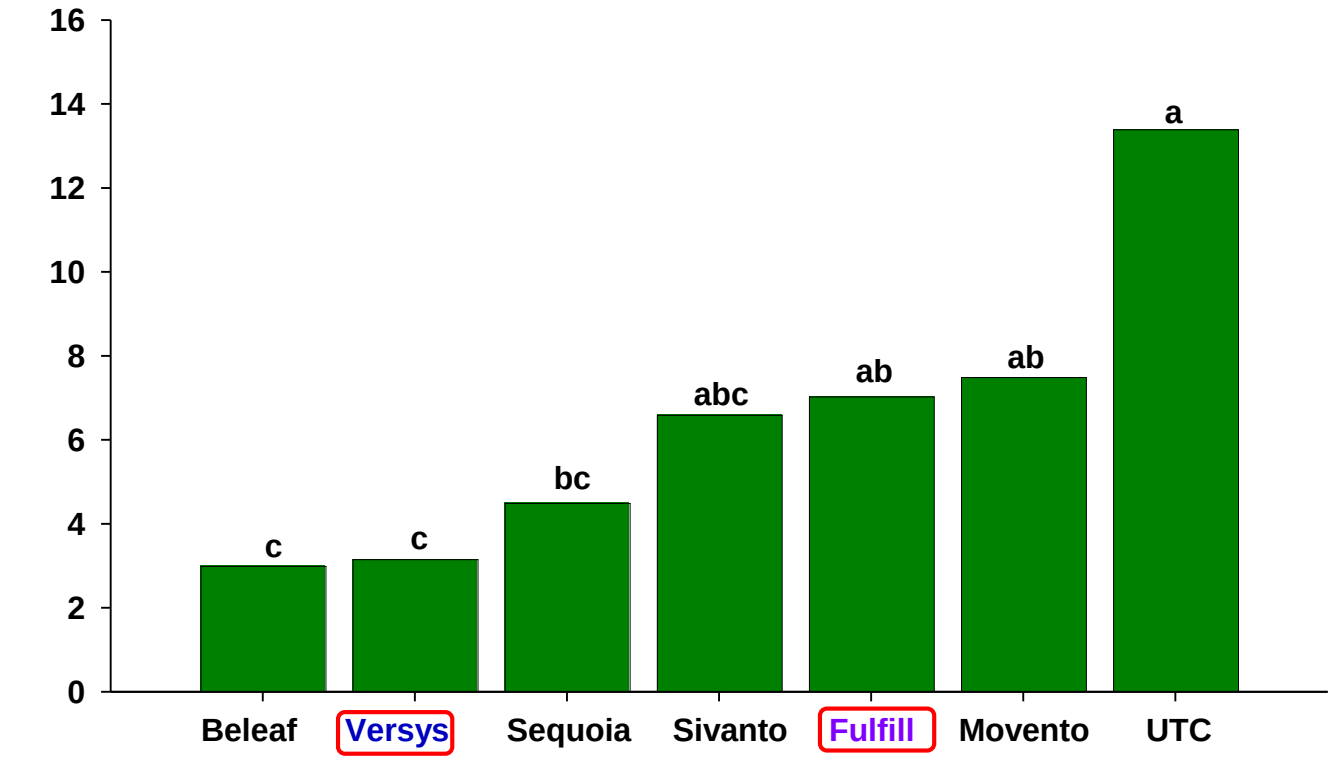
Green Peach Aphid Control in Baby Spinach: Versys

Yuma Ag Center, Spring 2016

- 2 applications
- 14 day spray interval
- 25 gpa@50 psi
- *No adjuvants used*

Aphids/ 10 leaves

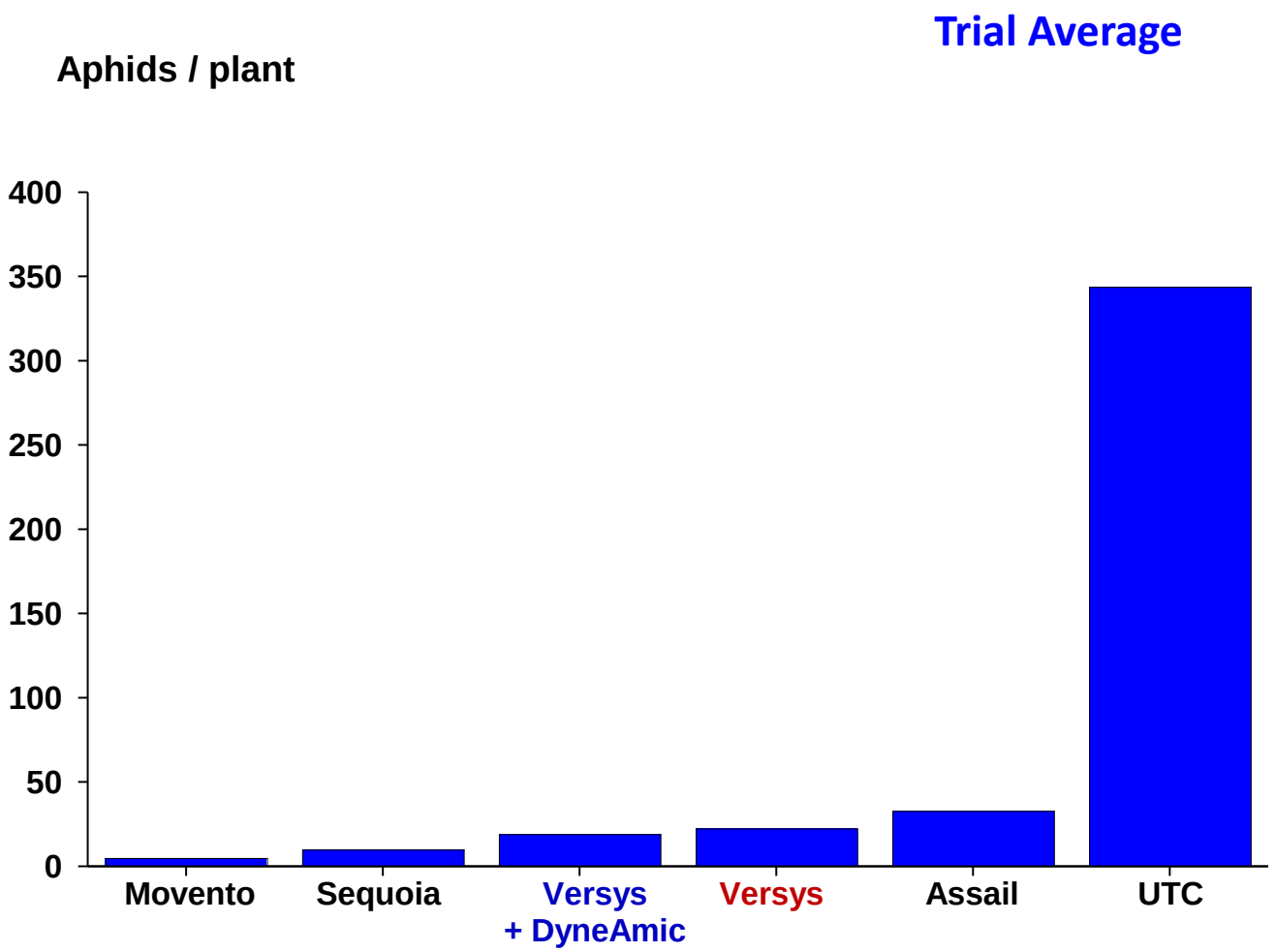
Trial Average



Green Peach Aphid in Cabbage

Versys Aphid Activity in Cabbage

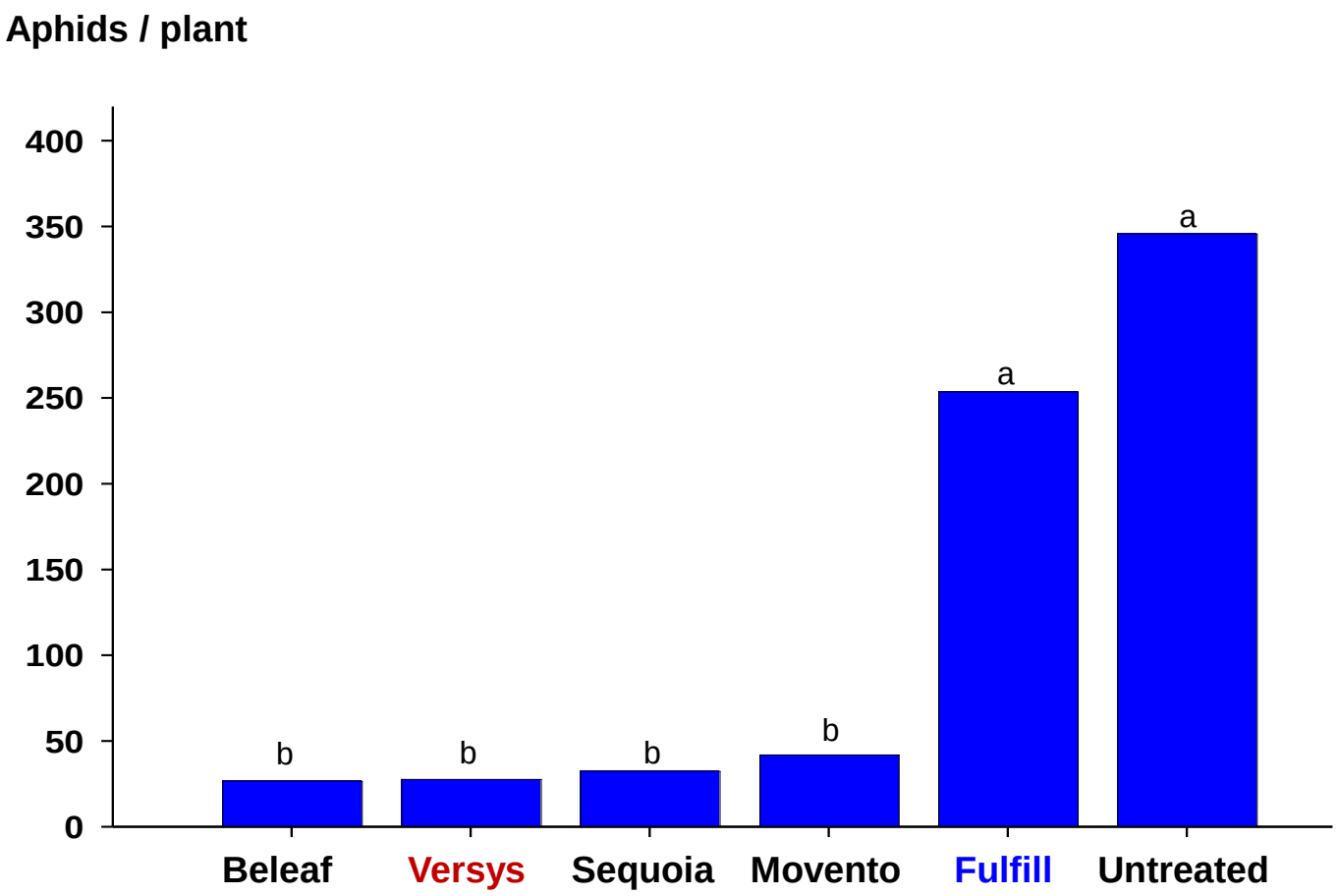
Yuma Ag Center, Spring 2013



- 2 applications
- 14 day spray interval
- 22.5 gpa@50 psi
- *Dyne-Amic @ 1 pt / 100 gal*

Versys Aphid Activity in Cabbage

Yuma Ag Center, Spring 2018



- 2 applications
- 14 day spray interval
- 22.5 gpa@50 psi
- *Dyne-Amic @ 1 pt / 100 gal*

Green Peach Aphid in Head Lettuce

Versys - Aphid Activity in Head Lettuce

Yuma Ag Center, Spring 2018

Treatment	Rate/ac
Versys	1.5 oz
Sequoia	2.0 oz
Beleaf	2.85 oz
Fulfill	2.8 oz
Movento	5.0 oz
Untreated	10.0

Dyne-Amic added to all sprays at 0.125% v/v

Trial I

- Wet date: 17 Nov
- 1 spray (24 Jan)
- 21.0 gpa @40 psi

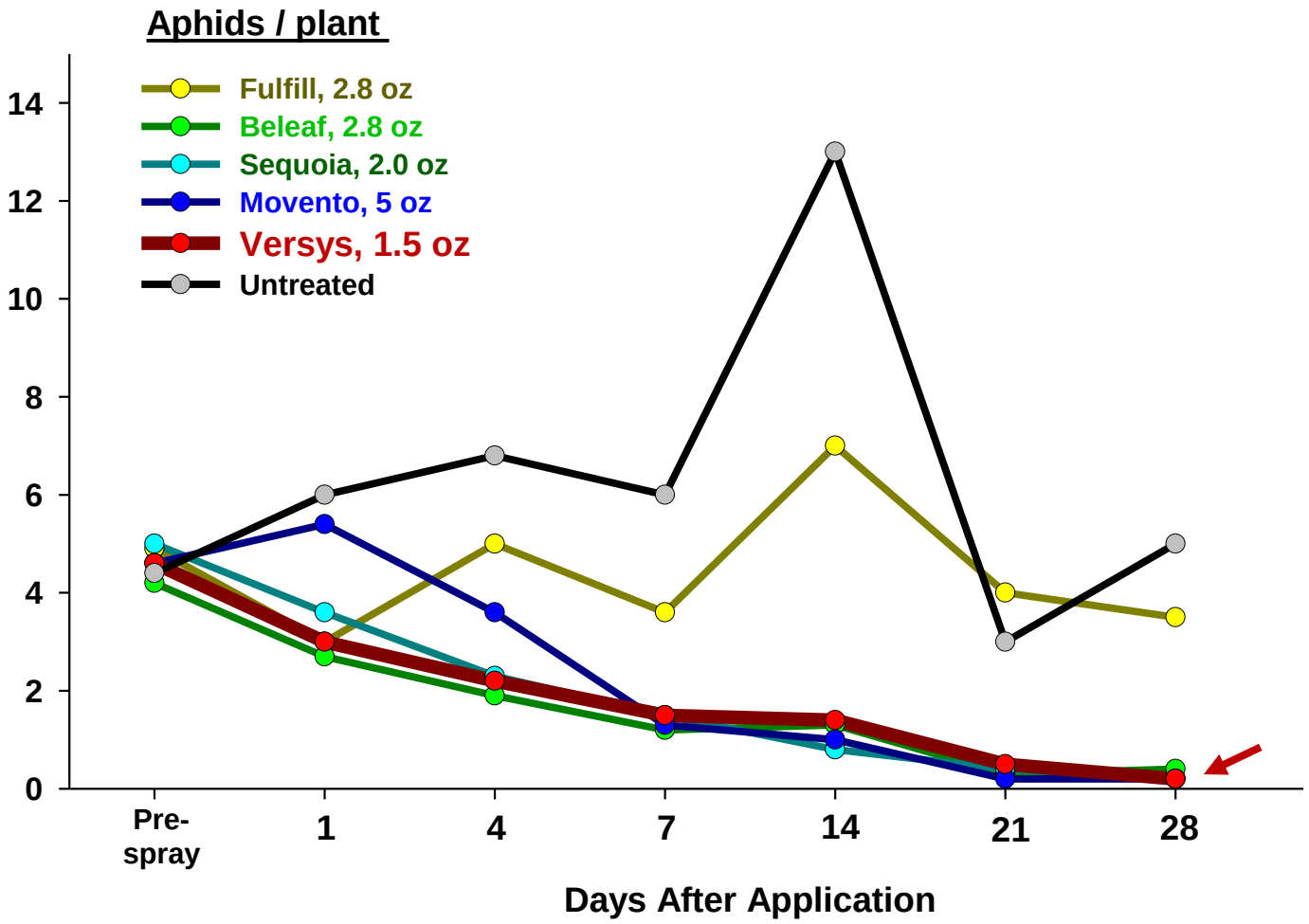
Trial II

- Wet date: 15 Dec
- 1 spray (5 Feb)
- 21.0 gpa @40 psi

Versys - Aphid Activity in Head Lettuce

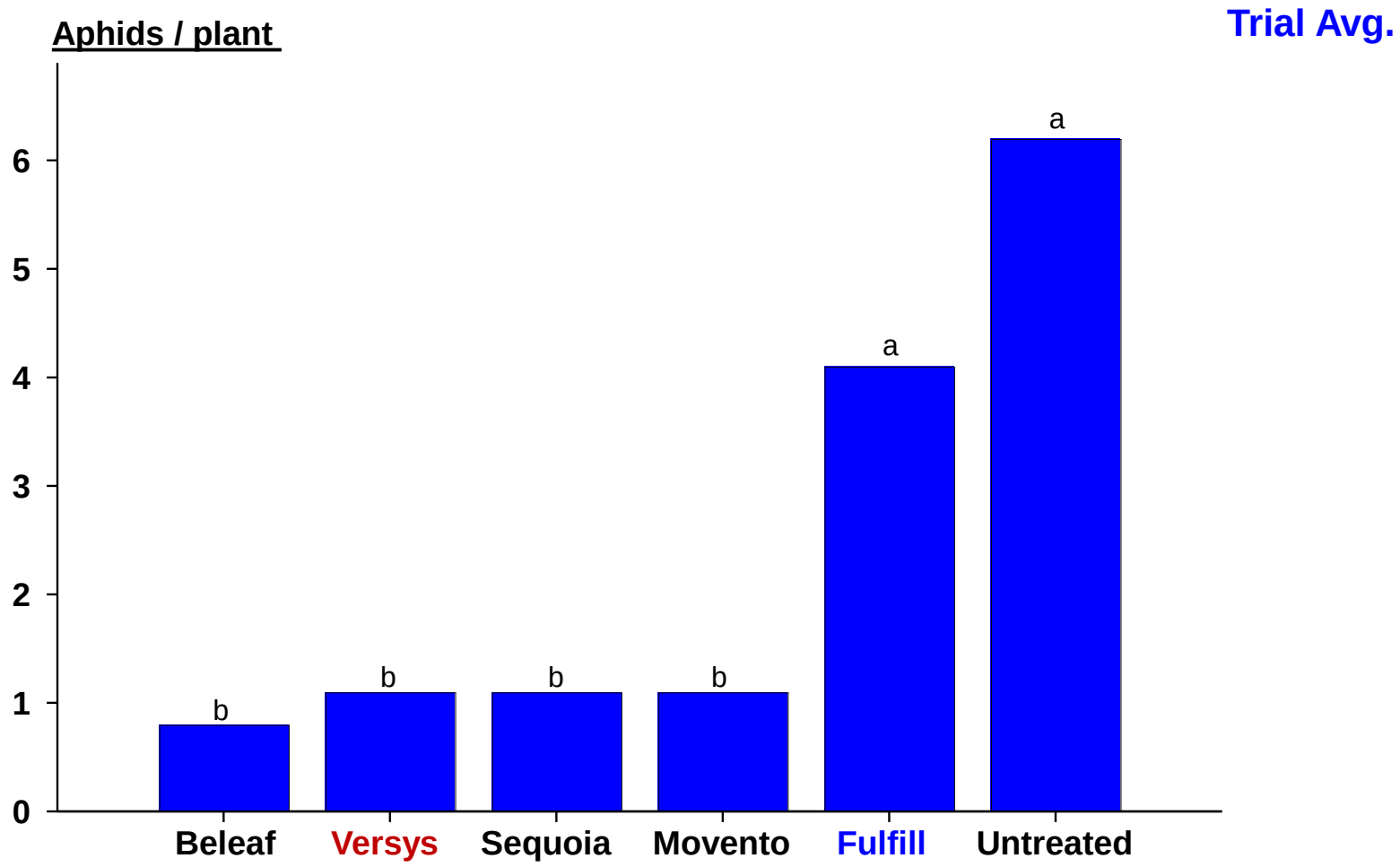
Yuma Ag Center, Spring 2018

Trial I



Versys - Aphid Activity in Head Lettuce

Yuma Ag Center, Spring 2018



Sweetpotato Whitefly in Cantaloupes

Sefina - Whitefly Efficacy on Fall Melons

Yuma Ag Center, Fall 2014

Treatment	Rate/ac
Sefina	**6.9 oz**
Exirel	20 oz
Pyrifluquinazon	3.2 oz
Assail	4.0 oz
Venom	4.0 oz
Untreated	-

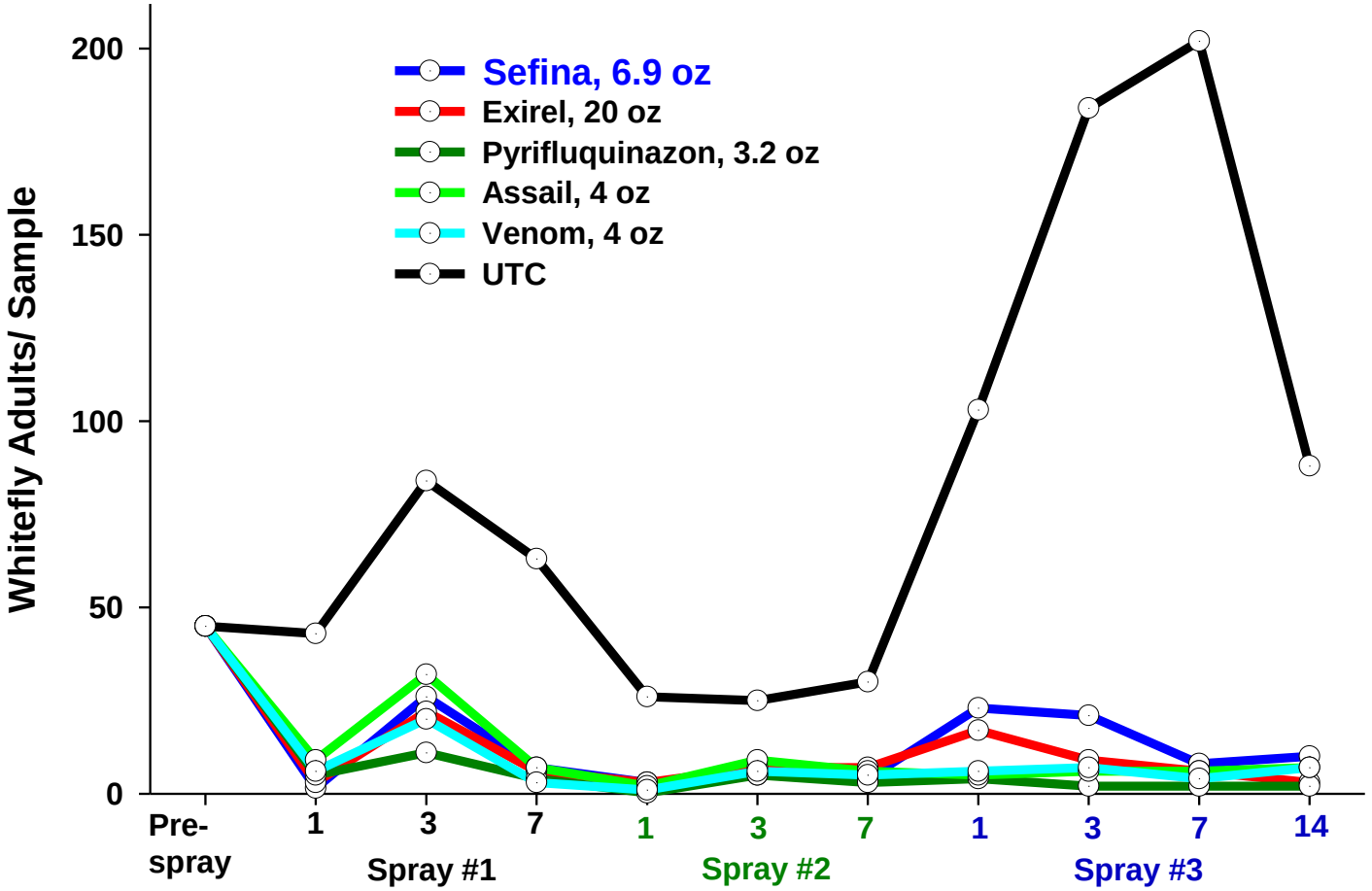
**Dyne-amic added at 0.125% v/v*

- 3 applications
- 7-14 day spray intervals
- Assessments @ 1, 3, 7 & 14 DAA

- ***Venom (6 oz) applied at plant to all plots except UTC***

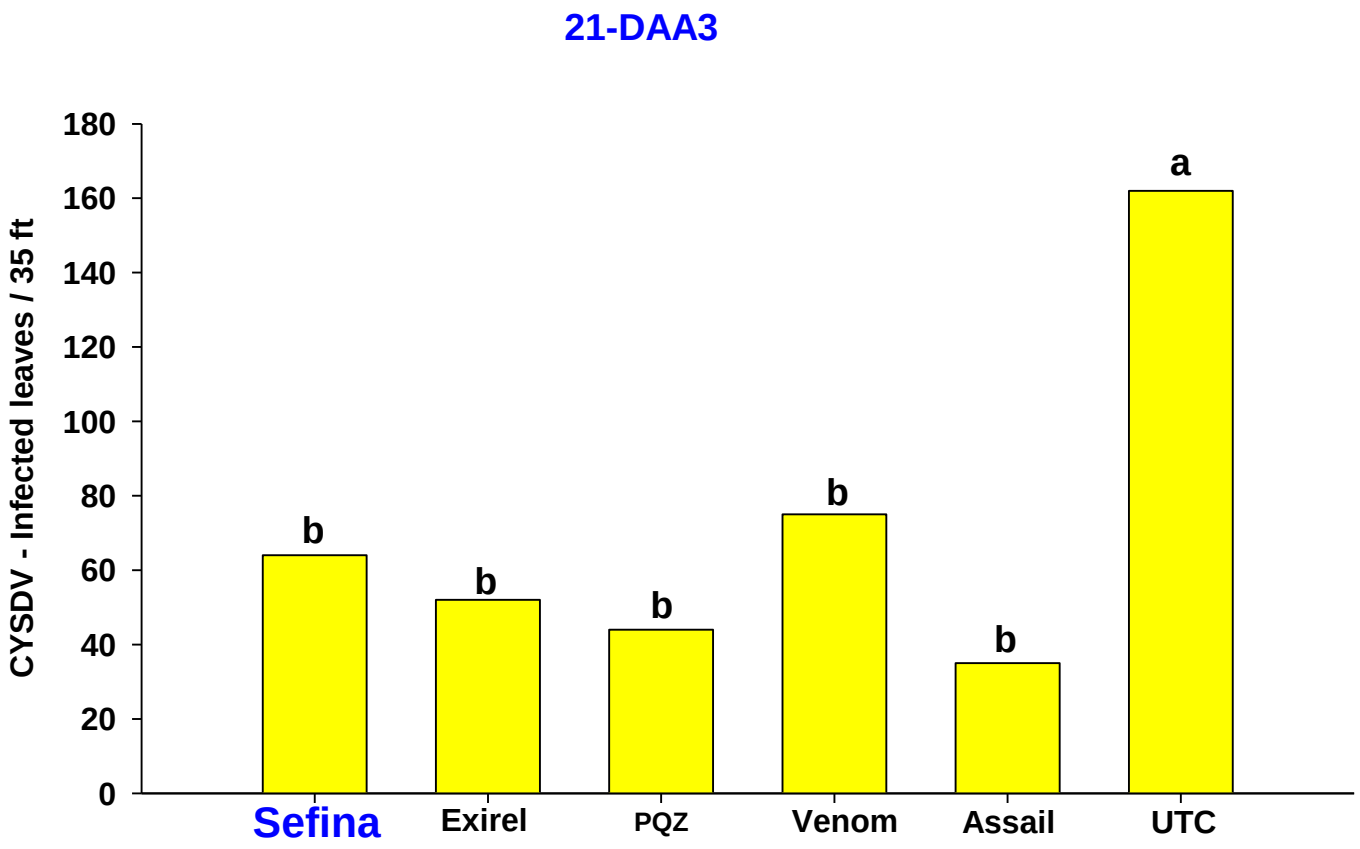
Sefina - Whitefly Efficacy on Fall Melons

Yuma Ag Center, Fall 2014



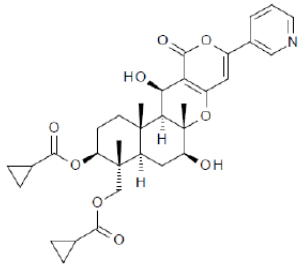
Sefina - Whitefly Efficacy on Fall Melons

Yuma Ag Center, Fall 2014



Versys, Sefina

Inscalis, *afidopyropen, BAS440*

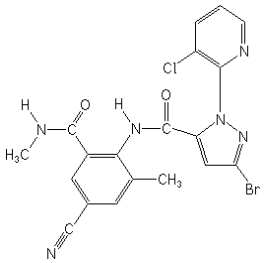


Sucking Insects

Pest	IPM Standards	Comparative Efficacy
Whiteflies –Nymphs	Exirel, Movento	**B**
Whiteflies – Adults/ *CYSDV*	Venom, Exirel	**A**
Aphids (GPA)	Movento, Sequoia	**A**

A	**As good as** the standard
B	**Not as good as** the standard
C	**Not economically effective**

PQZ *Pyrifluquinazon* (Labs 140, NNI-0101)



Chemistry

- **Quinazolinone**
- **IRAC group - 9**

Mode of Action

- **Chordotonal TRPV channel modulator**
  (disrupts feeding behavior)

Route of Activity

- **Foliar translaminar**
- **Contact / ingestion**

Effective Spectrum

- **Whiteflies, Aphids, Citrus thrips**

Effective Rates

- **Foliar: 3.2 oz**

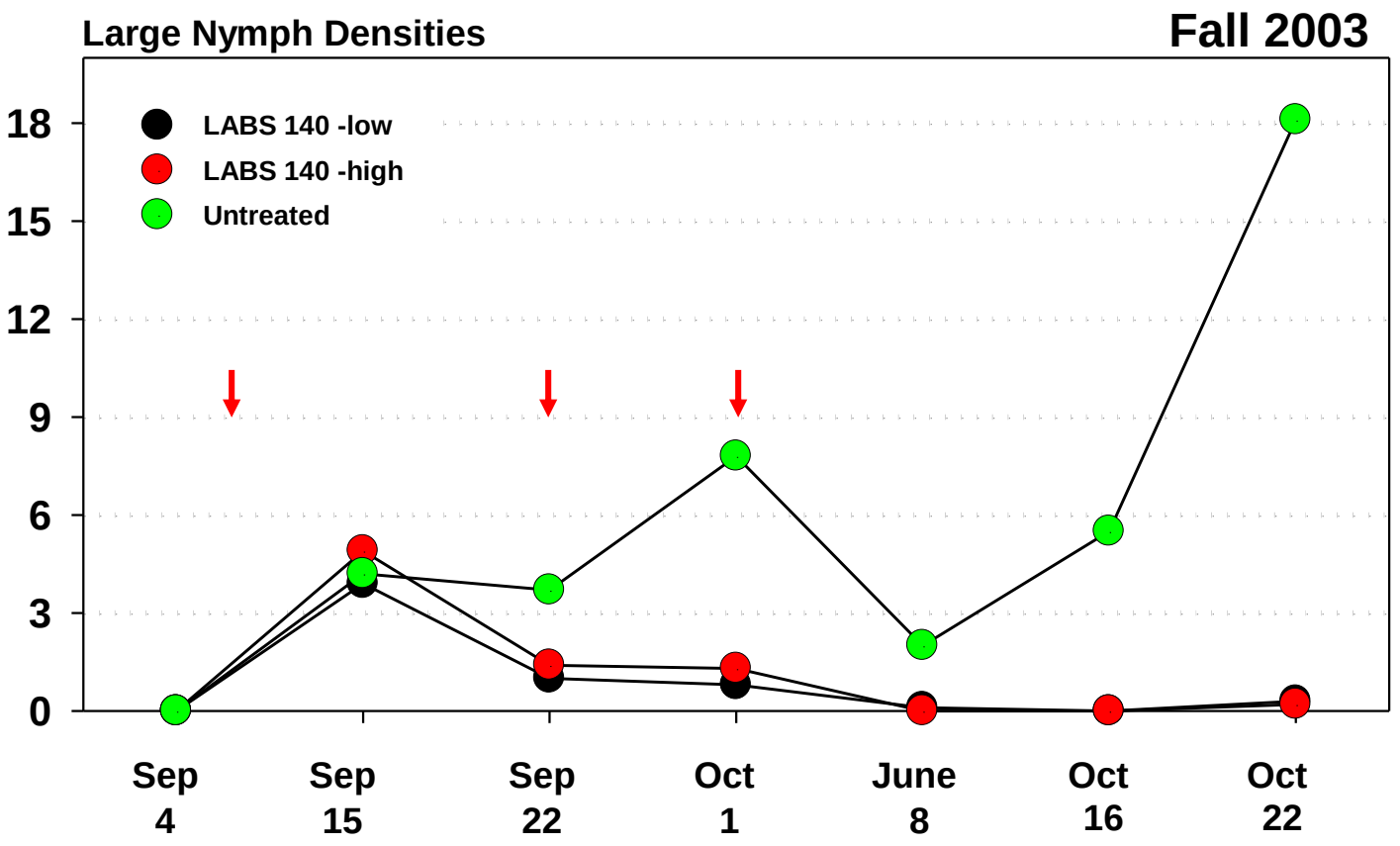
Key Crops:

- ***Leafy Vegetables, Brassica and Melons***

PQZ 20 SC

LABS 140

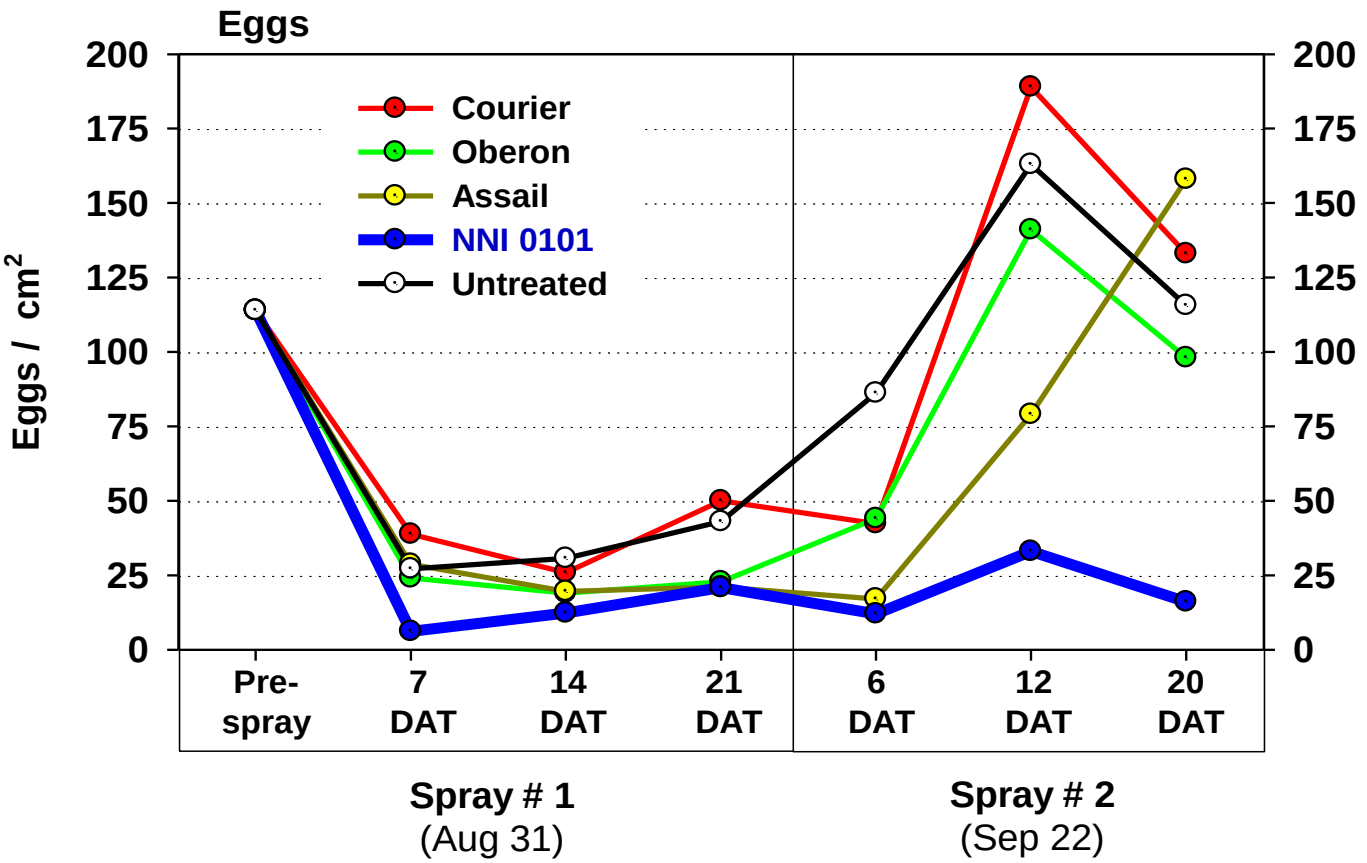
- Unknown Chemistry
- Unique MOA
- Feeding Paralysis




Fall 2003
Labs 140 (High)
Untreated Check
Labs 140 (Low)

NNI-0101 Performance in Fall Melons

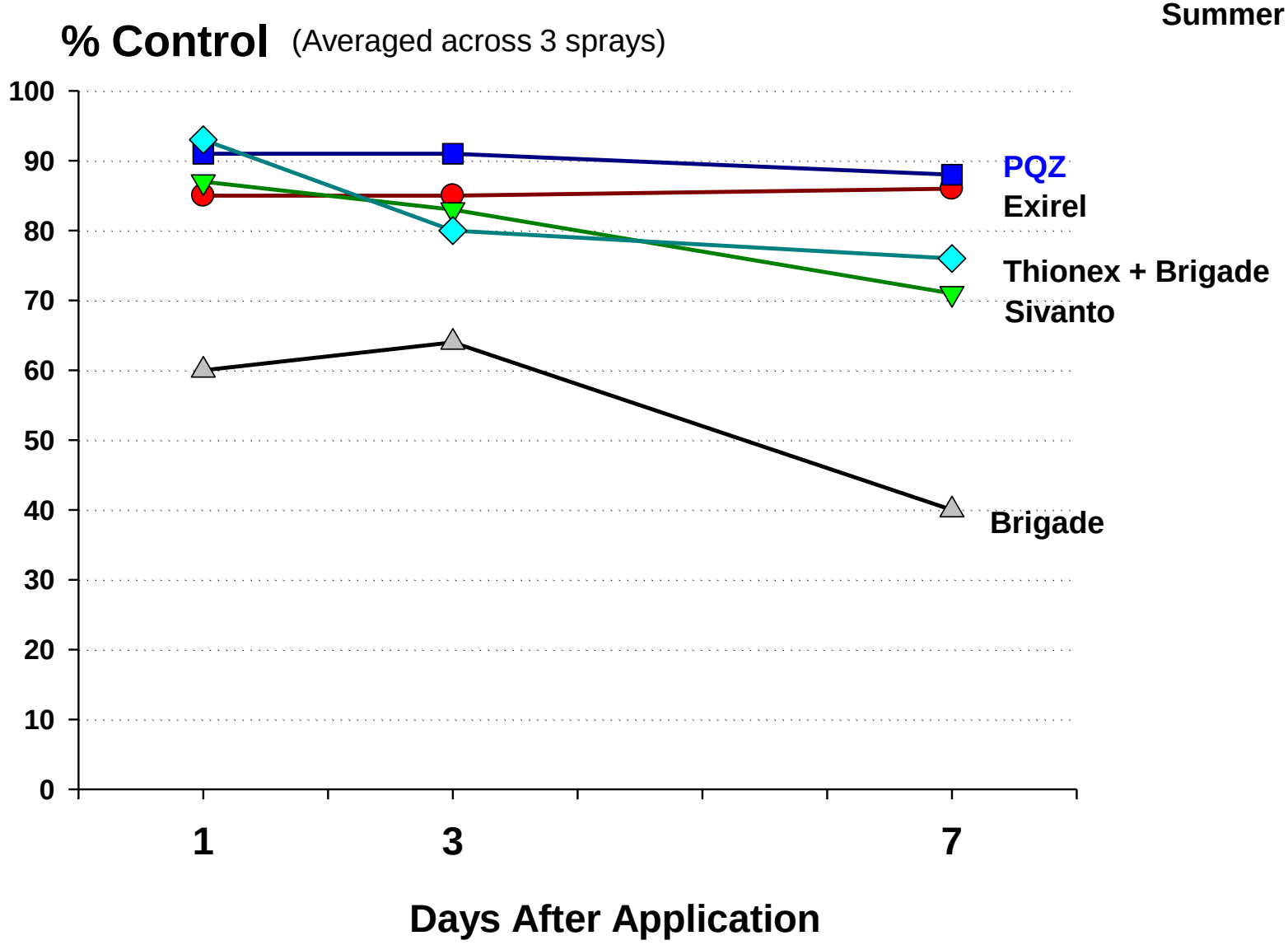
Yuma Agricultural Center, 2005



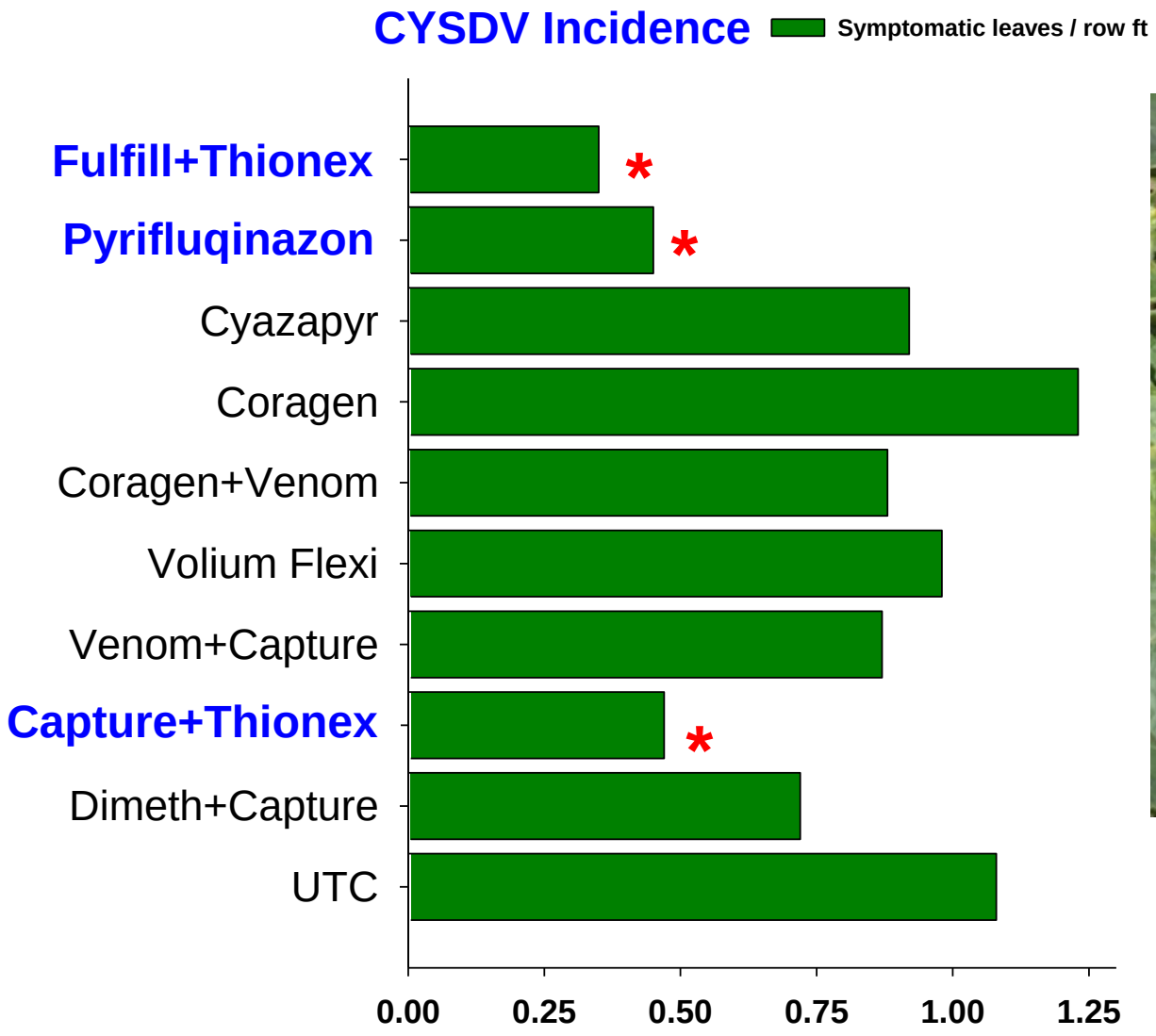

Fall 2005
NNI - 0101
Assail
Untreated

Experimental Insecticides for Whitefly Adult / CYSDV

Summer 2008



Foliar Insecticides on Whitefly Adults – Summer Trial -2009



July 1

* Significant reduction

~ 60-65%

2013

PQZ

Assail

Untreated check


2013
Venom
PQZ
Endigo
Non-treated

PQZ Performance

2008-2017

Product	Trials	Sprays
Capture + Thiodan	3	9
Assail	11	33
Exirel	17	46
Venom	17	48
PQZ	**21**	**60**

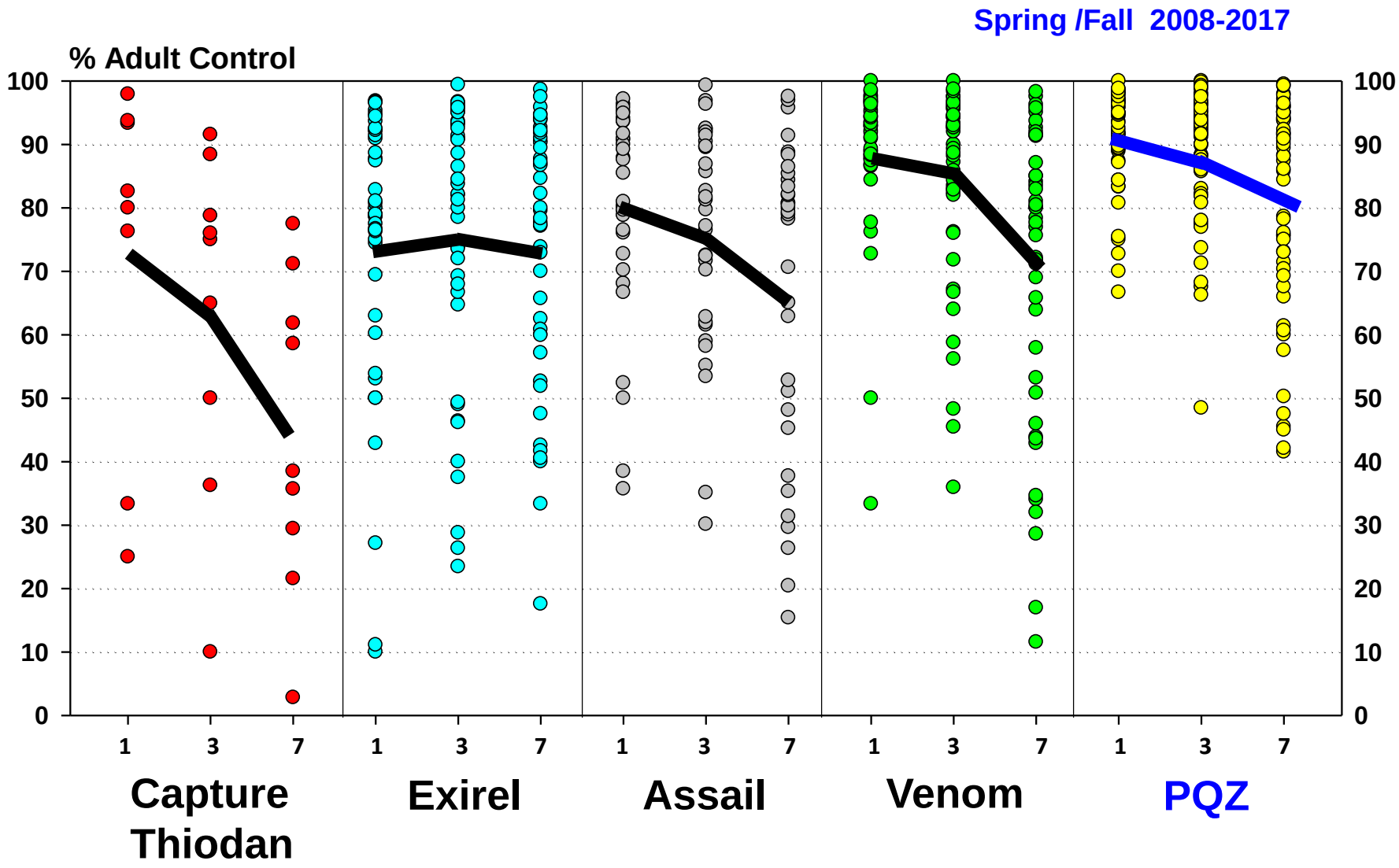
Experimetal Design

- Replicated plots: 1 bed * 45 ft
- Foliar sprays: 20 - 25.5 gpa / 50 psi

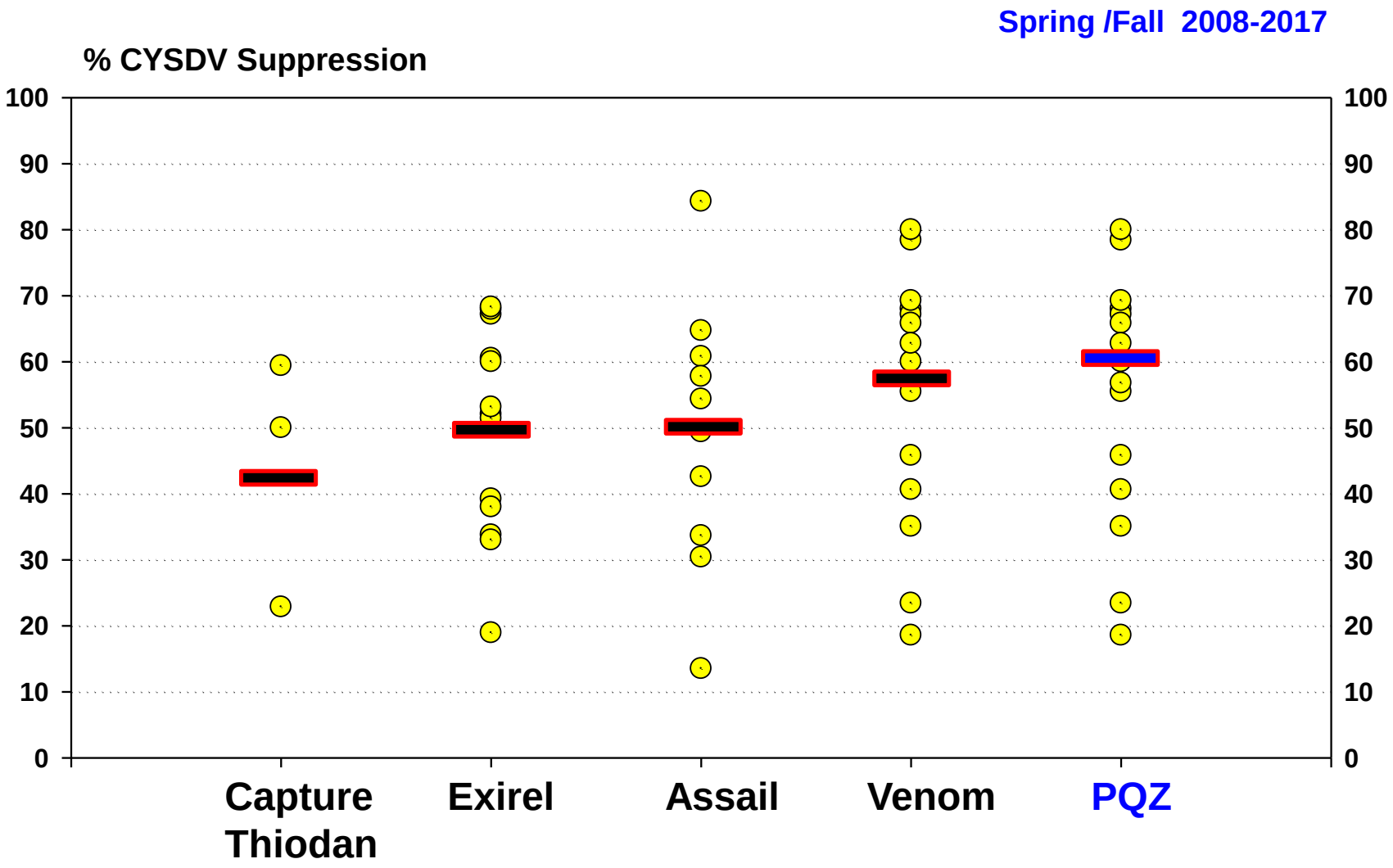
Assessments

- Adult whitefly abundance
- 1, 3 and 7 DAA
- Vacuum sample
- CYSDV Incidence

PQZ Adult Whitefly Control



PQZ CYSDV suppression



WF /CYSDV Management Program

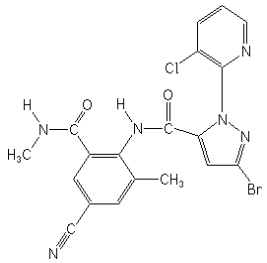
Soil, systemic insecticides

- *Venom /Scorpion*
- *Sivanto*

Aggressive foliar regime

- *Assail*
- *Venom / Scorpion*
- *Exirel*
- *PQZ*
- *Sefina*

PQZ *Pyrifluquinazon* (Labs 140, NNI-0101)



Insect efficacy in small plot trials
Yuma Ag Center, 2003-2017

Sucking Insects

Pest	IPM Standards	Comparative Efficacy
Whiteflies – Adults / Nymphs	Exirel, Movento	**A**
Whiteflies – *CYSDV*	Venom, Exirel	**A**
Aphids	Movento	**A**
Citrus thrips	Delegate	**A**

A	**As good as** the standard
B	**Not as good as** the standard
C	**Not economically effective**


ARIZONA
VEGETABLES