

REQUIEM:

A new product for control of
thrips, whiteflies, mites and
other sucking pests

Sarah Reiter

October 20, 2009

ABIM, Lucerne

REQUIEM[®]

- New Active Ingredient
 - Extract of *Chenopodium ambrosioides* near *ambrosioides*
- Modes of Action
 - Collapses trachea causing asphyxiation
 - Destroys cuticle layer causing desiccation
 - Anti-feeding properties



*Chenopodium
ambrosioides*

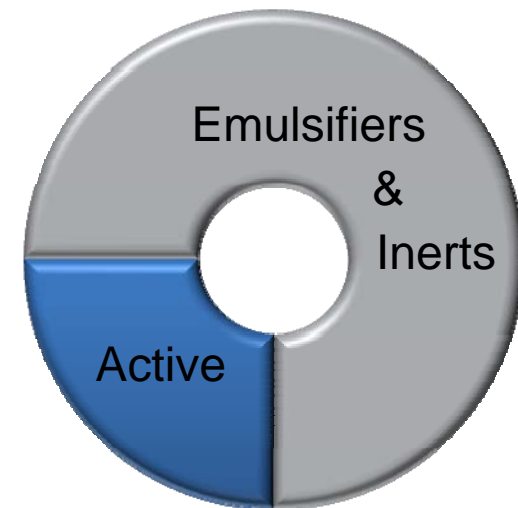
REQUIEM Discovery

- REQUIEM is based on an extract of *Chenopodium ambrosioides* near *ambrosioides*
 - Relative of common lambsquarter
- The active ingredient in REQUIEM was discovered after screening various candidate plants
 - *Chenopodium ambrosioides* produces mixture of plant terpenoids with desired efficacy profile
 - Our *Chenopodium* is a proprietary cultivar with unique profile conducive to developing pesticides



REQUIEM[®]IG

- Formulation has been optimized to deliver the active ingredient most effectively
 - Emulsifiable Concentrate (EC) with 25% active ingredient
 - Also contains emulsifiers and inerts designed to optimize delivery of AI
 - Suspension and flowability
 - Leaf adherence
 - Lipophilicity
- Active Ingredients:
 - Not systemic
 - Not translaminar
 - Contact activity is important



A vertical strip on the left side of the slide contains several small images: a cluster of colorful bell peppers (red, yellow, orange) at the top; a close-up of a blue textured surface, possibly a leaf or fabric; a basket of fresh produce including tomatoes, a yellow squash, and a pumpkin; a close-up of a green leaf with a small insect; a cluster of red tomatoes; and a watermelon at the bottom.

REQUIEM[®]

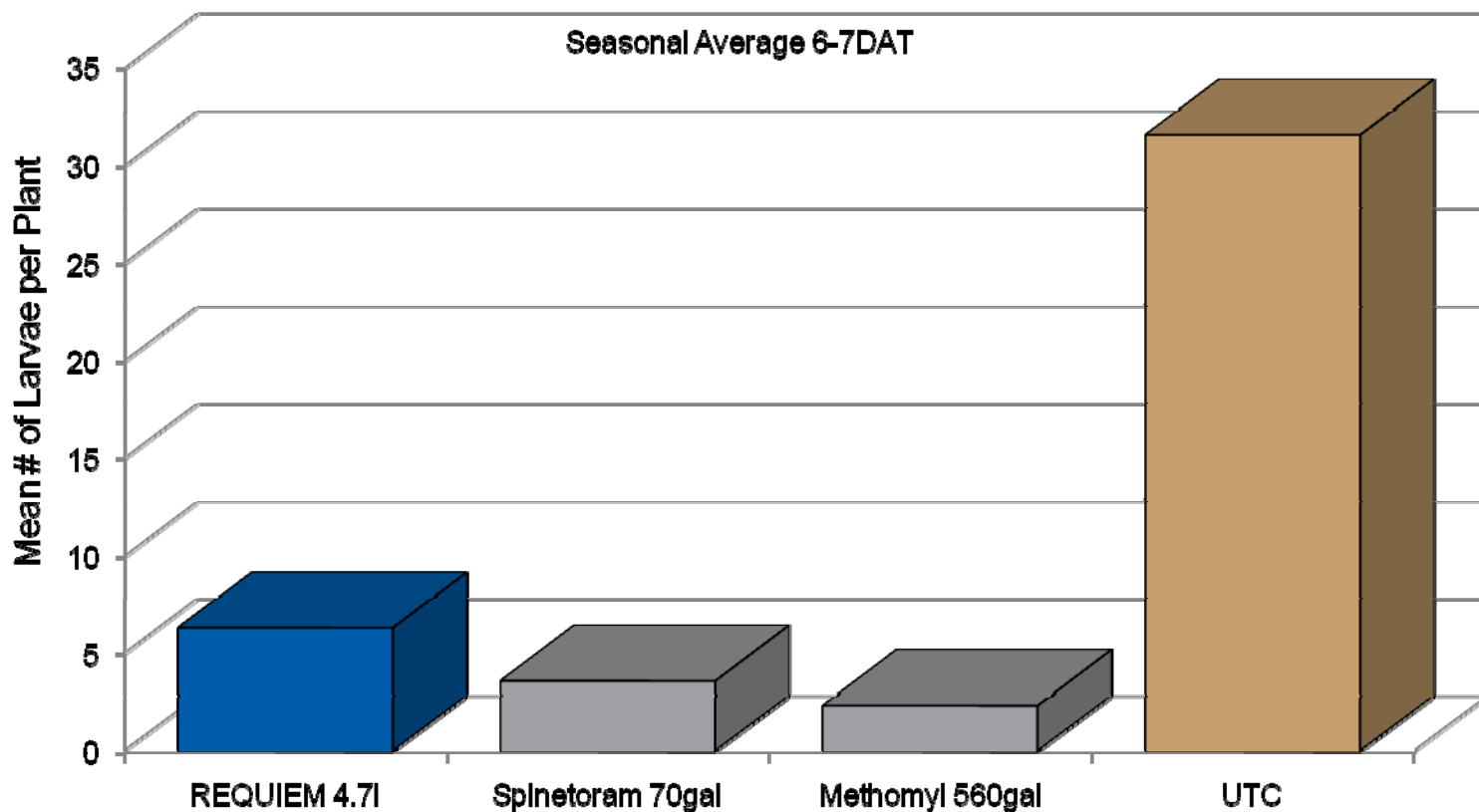
REQUIEM reduces populations of eggs, larvae/juveniles and adults of:

- Thrips
- Whiteflies
- Mites
- Aphids

REQUIEM also deters feeding and reduces the spread of viruses.

REQUIEM[®]

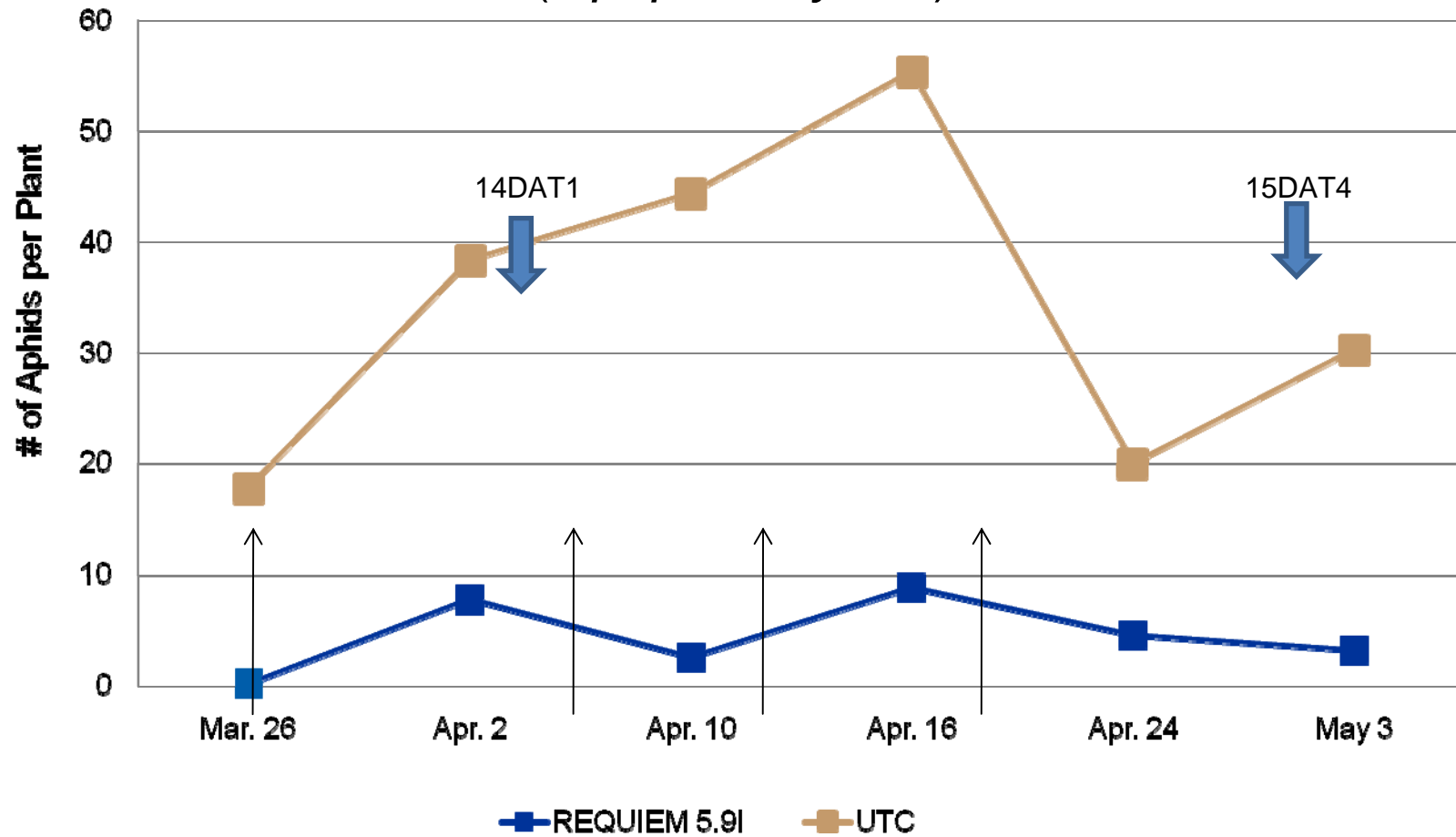
Controls Western Flower Thrips on Onions as well as conventional insecticides
(*Frankliniella occidentalis*)



T. X. Liu, Texas A&M Univ., TX – 2008.
Four applications, 7D intervals.
(80350)

REQUIEM[®]

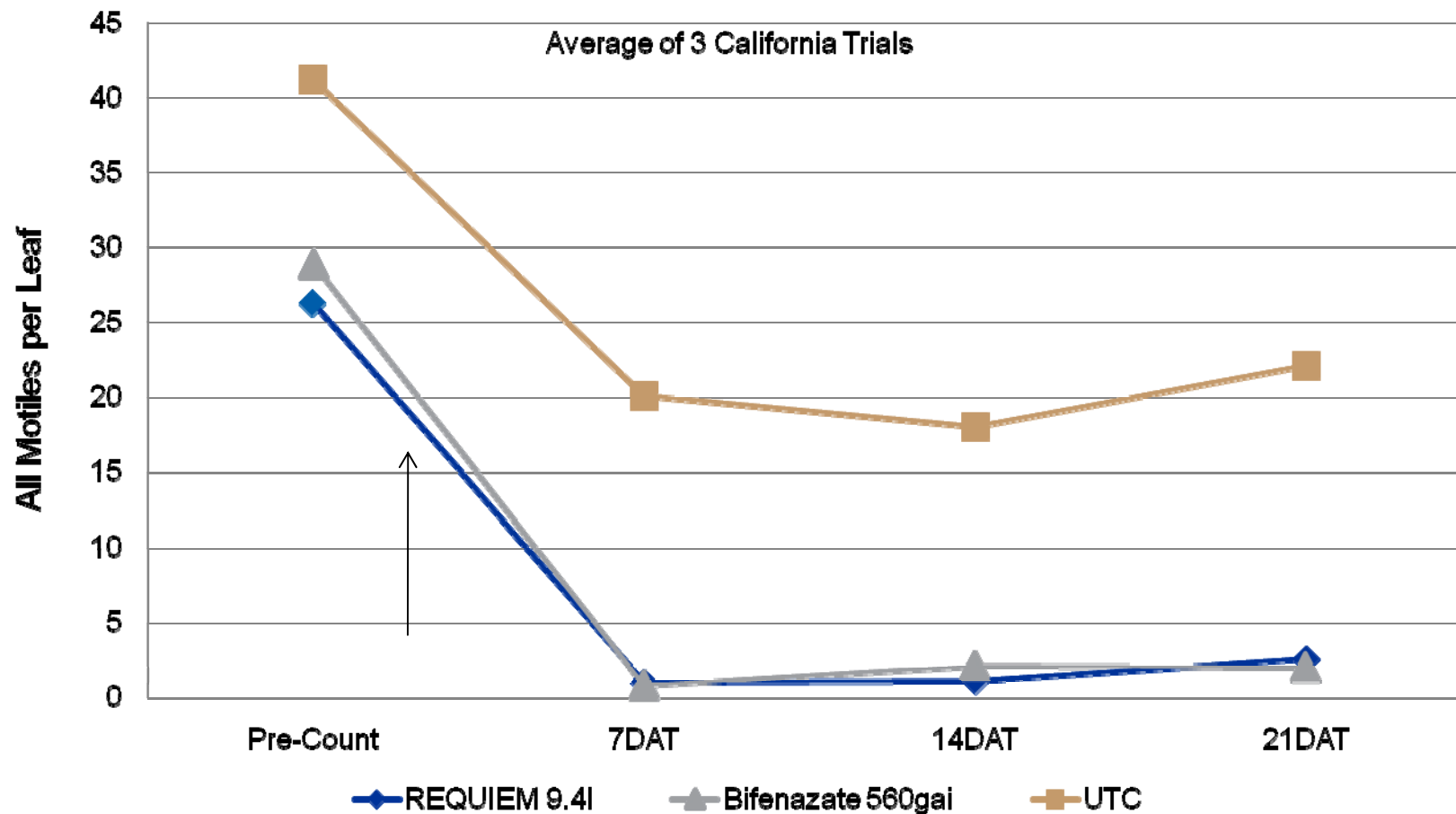
Controls Turnip Aphids on Cabbage (*Lipaphis erysimi*)



T. X. Liu, Texas A&M Univ., TX – 2007.. Applications
1= Mar. 20; 2= Apr. 3; 3= Apr. 11; 4= Apr. 18.
(70456)

REQUIEM[®]

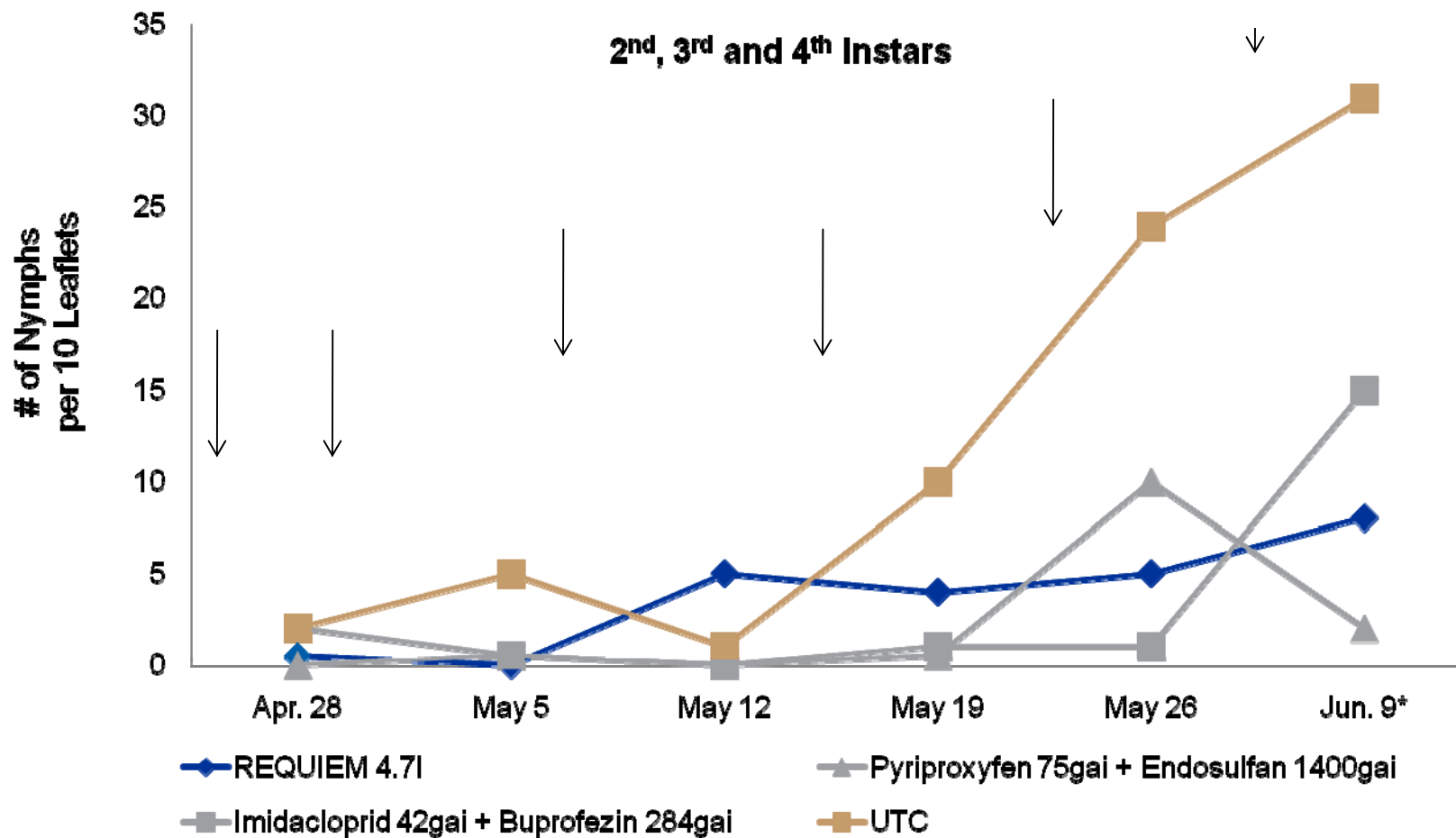
Delivers control of motile (juvenile + adult) Spider Mites* equivalent to standard on Grapes up to 21 days



**Tetranychus pacificus*
(70152, 80120, 80121)

REQUIEM[®]

Controls Whitefly nymphs on Tomatoes as well as conventional insecticide tankmixes



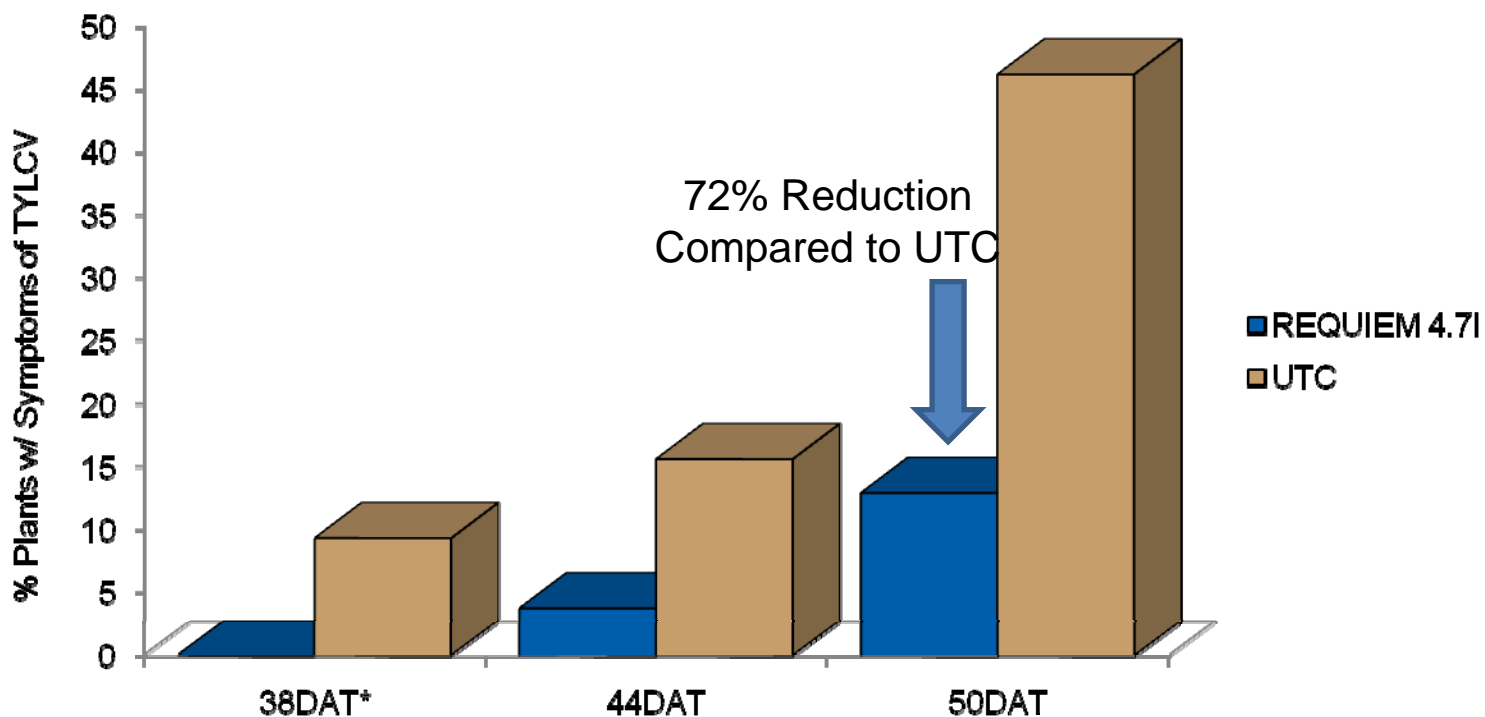
D. Schuster, Univ. of Florida, FL – 2008.
(80321)



Tomato Yellow Leaf Curl Virus
Gemini virus
Present in Israel for >40 years
Early 90's, Cuba, Jamaica, & Dominican
Republic
Now problem in GA/FL USA

REQUIEM[®]

Controls Whiteflies, helping to reduce virus incidence on Tomatoes



D. Schuster, Univ. of Florida, FL – 2007. *DAT = Days after transplanting. REQUIEM applied every 7 days (70467)

REQUIEM[®]

Reduces TYLC Virus incidence



Untreated Check



REQUIEM 4.7I on 7-day interval

D. Schuster, Univ. of Florida – 2007. Pictures taken approximately 50 days after transplant. Arrows point to TYLC infected plants. (70467)

REQUIEM[®]

Reduces Watermelon Vine Decline

WVD = Squash Vein Yellowing Virus
Potyvirus
New problem in GA/FL USA



REQUIEM 4.7I alone
2 - 9



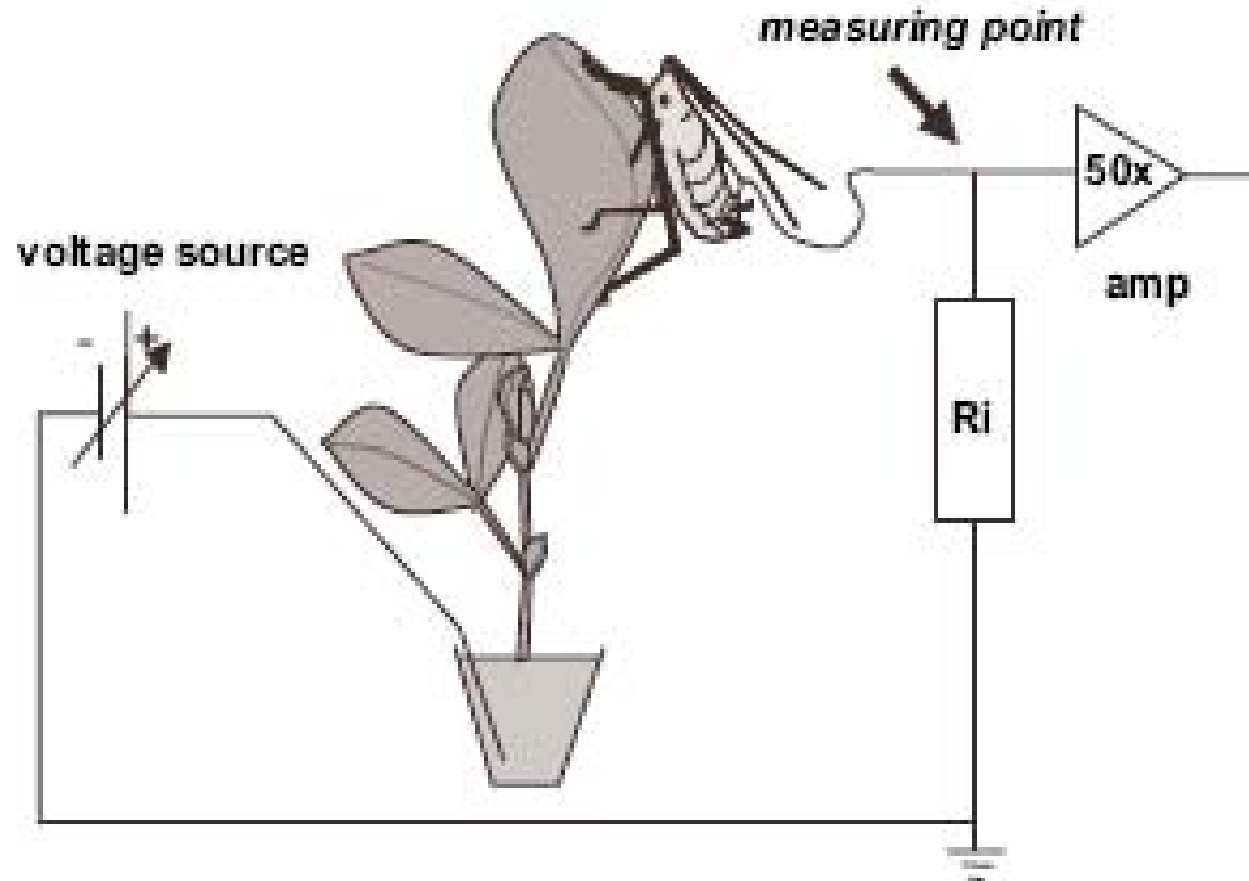
**Imidacloprid soil +
Pymetrazine 2,3
Endosulfan 4,5,8
Spiromesifen 6,7
Pyriproxyfen 9**



UTC

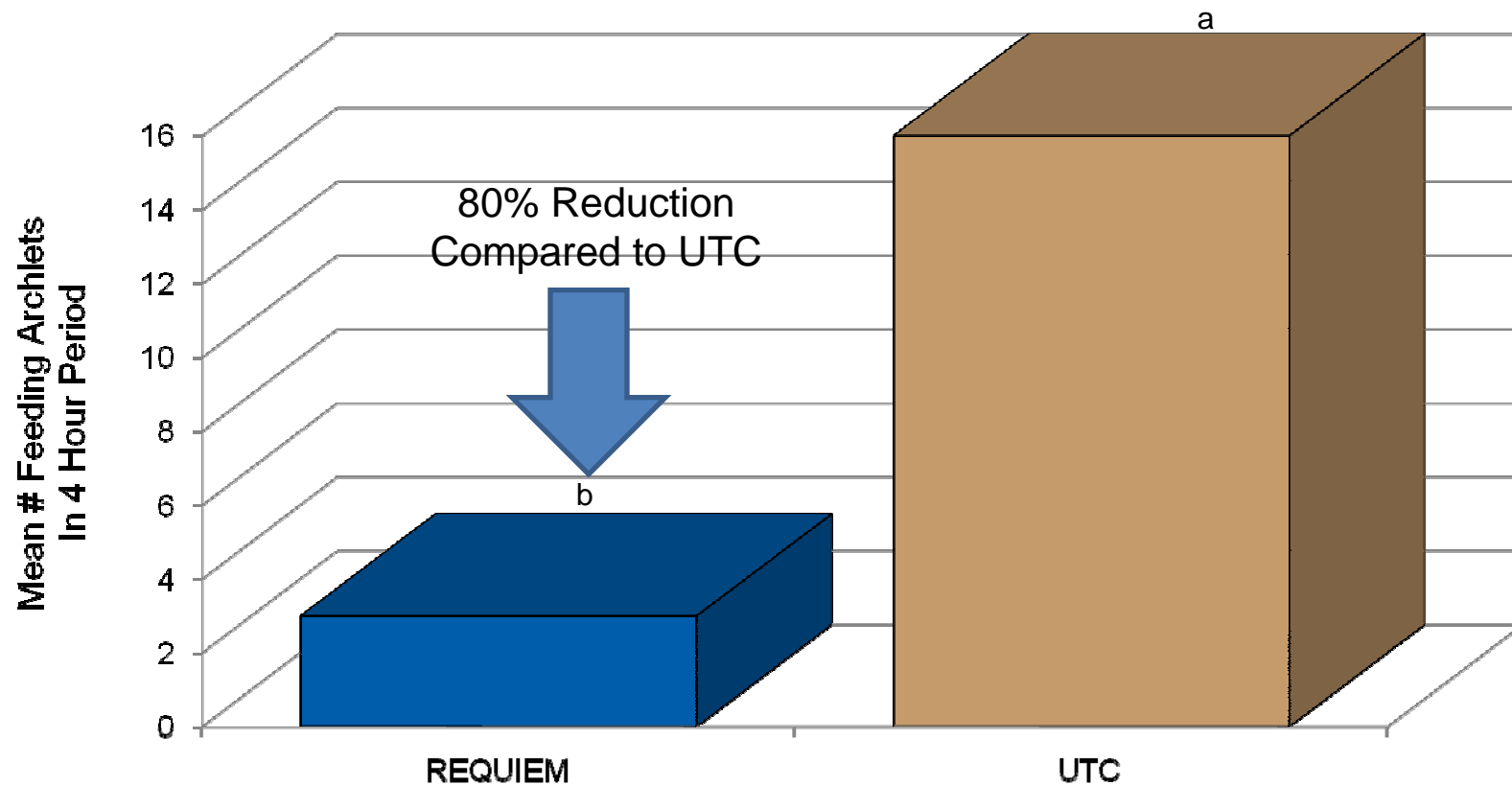
P. Roberts/P. Stansly, Univ. of Florida –
2008. Pictures taken approximately 60
days after transplanting.
(80431)

Aphid Feeding Diagram



REQUIEM[®]

Reduces Feeding Probes in
Myzus persicae and *Aphis gossypii*



Jeff Davis, LSU – 2008. EPG lab trials, both aphid species data combined. 24 Hours after application, aphids placed on leaf (80428)



REQUIEM[®]

Fits IPM programs because it has negligible effect on beneficials:

Field trials and lab studies confirm safety on:

- Bees (*Apis mellifera*)
- Predatory mites (*Amblyseius fallacis*)
- Lady Beetle (*Stethorus punctum*)
- Mite predators (*Zetzellia mali*, *Neoseiulus fallacis*, *Typhlodromus pyri*)
- Syrphid Flies
- Minute Pirate Bug (*Orius insidiosus*)
- Aphid Midge
- Parasitic wasps (*Encarsia*, *Eretmocerus spp*)

REQUIEM[®]

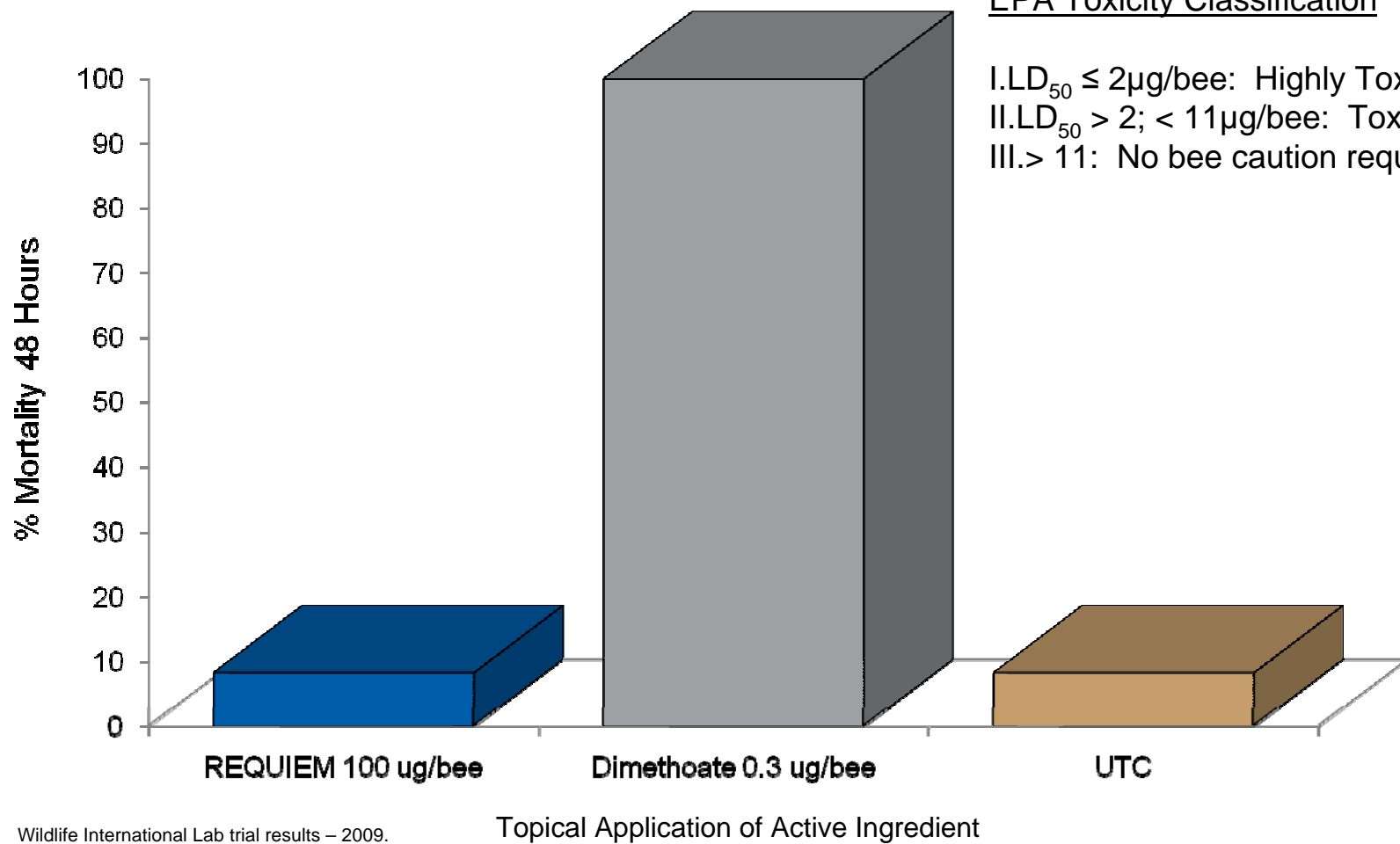
Safe on Honey Bees

EPA Toxicity Classification

I. $LD_{50} \leq 2\mu\text{g}/\text{bee}$: Highly Toxic

II. $LD_{50} > 2; < 11\mu\text{g}/\text{bee}$: Toxic

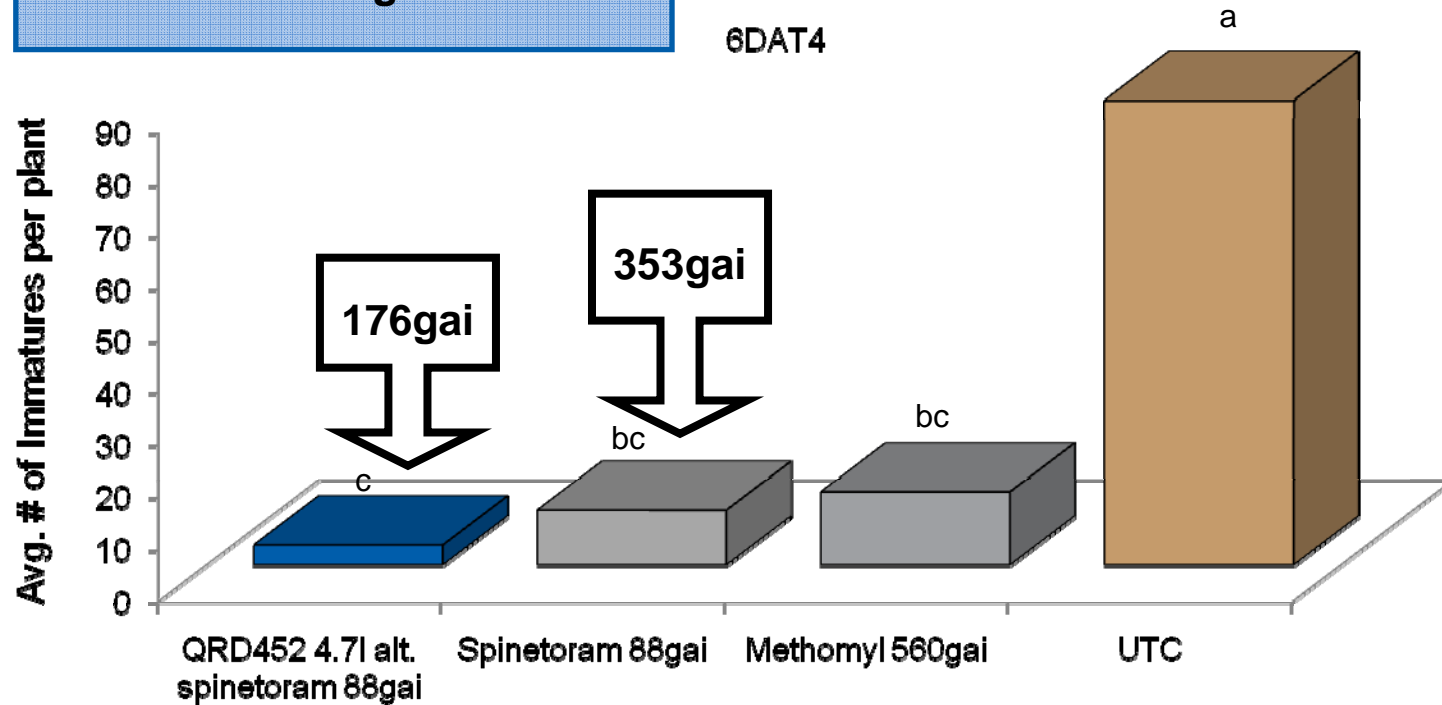
III. > 11 : No bee caution required



REQUIEM[®]

Reduces chemical load while delivering same control

Viable option to reduce chemical load and help with resistance management



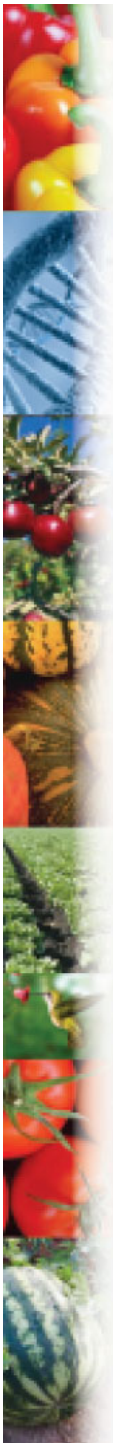
C. Collins, Collins Ag Consultants, OR – 2008. Means followed by same letter NSD. H₂O volume: 20GPA. **Frankliniella occidentalis* (80294)

A vertical strip of images on the left side of the slide, showing various agricultural products and a person working in a field. From top to bottom: a close-up of colorful bell peppers (red, yellow, green), a close-up of a blue textured surface (possibly a leaf or fabric), a basket of fresh produce including tomatoes, cucumbers, and leafy greens, a person in a field, and a watermelon.

REQUIEM[®]IG

Summary:

- Increases farmer productivity:
 - Controls thrips, whiteflies, mites, aphids
 - Direct mortality
 - Feeding deterrent and virus reduction
 - Novel modes of action to deter the development of resistance
- Provides clean, low residue food:
 - Exempt from requirement for tolerances, MRL
 - Replace harsher chemistries
 - Performs well in programs for lower chemical load
- Improves the environment:
 - Safe on all key beneficials and bees
 - 0 day PHI, 4 hour REI, etc



SERENADE[®]
MAX

SERENADE[®]
ASO

SONATA[®]

BALLAD[®]
PLUS

BARITONE[®]

RHAPSODY[®]

REQUIEM[®]

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The SERENADE and RHAPSODY products are protected by U.S. Patent Nos. 6060051, 6103228, 6291426, 6417163, and 6638910. In addition, these products are protected by patents in numerous other countries.

The SONATA and BALLAD products are covered by U.S. Patent Nos. 6245551, 6586231, and 6635245 and by patents in numerous other countries. BARITONE™ is a trademark of AgraQuest, Inc.

The BARITONE product is manufactured and distributed subject to EPA Reg. No. 62637-5-69592.

BARITONE Bio-Insecticide is currently registered for use in the following states: Arizona, California, Colorado, Florida, Georgia, Idaho, Maryland, Michigan, Nevada, North Carolina, Oregon, South Carolina, Virginia and Washington

Products comprising the *Muscodor* fungus are protected by U.S. Patent No. 6,911,338 and are the subject of numerous pending patent applications worldwide.

AgraQuest owns the following product registrations: SERENADE MAX - EPA Reg. No. 69592-11; SERENADE ASO - EPA Reg. No. 69592-12; SONATA - EPA Reg. No. 69592-13. These products are also registered in numerous other countries worldwide.