

Arthropod Pest Management in Organic Celery and Zucchini

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eJournals: ucanr.edu/strawberries-vegetables and ucanr.edu/pestnews

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Root aphids in organic celery



Rice root aphid, *Rhopalosiphum rufiabdominale*



Photo by Brian Cabrera



Honeysuckle aphid, *Hyadaphis foeniculi*



Photo by A. Jensen, aphid.aphidnet.org

Root aphids in organic celery

Treatments

1. Untreated control
2. Ecotec (rosemary oil 10% and peppermint oil 2%) 19.2 fl oz + Kinetic (silicone and non-ionic surfactants) 12 fl oz
3. AzaGuard (azadirachtin) 6.3 fl oz + OroBoost (alcohol ethoxylate) 20 fl oz
4. Mycotrol-O (*Beauveria bassiana*) 1.5 qrt
5. Mycotrol-O 1.5 qrt + AzaGuard 6.3 fl oz
6. Venerate (*Burkholderia* spp.) 2 gal
7. Grandevo (*Chromobacterium subtsugae*) 2 lb

Application Through drip (250 gal for 40-45 min)

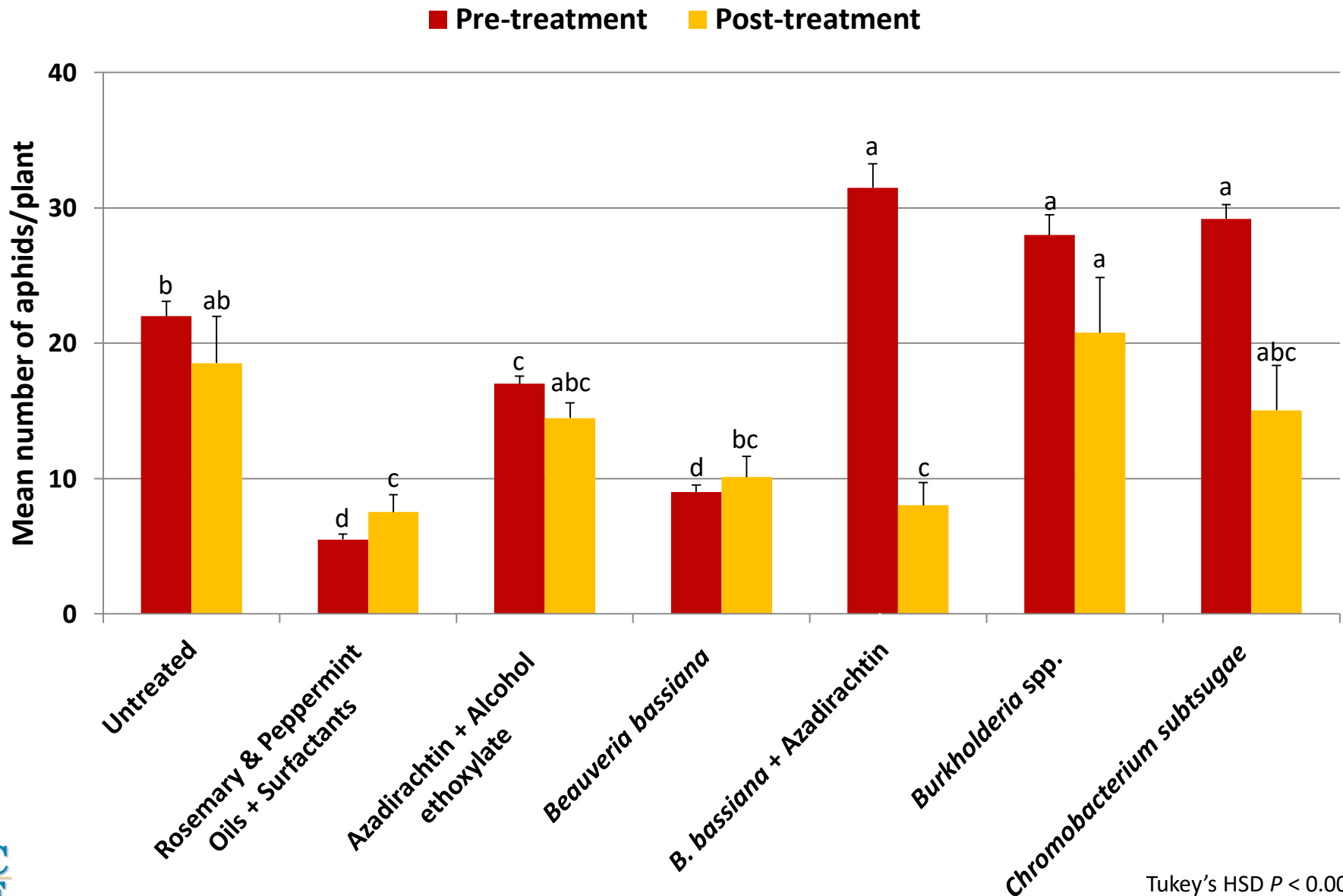
Plot size 4 beds (0.3 acre)

Sampling 10 plants from 4 parts of each plot

Treated on December 9 and 23, 2014

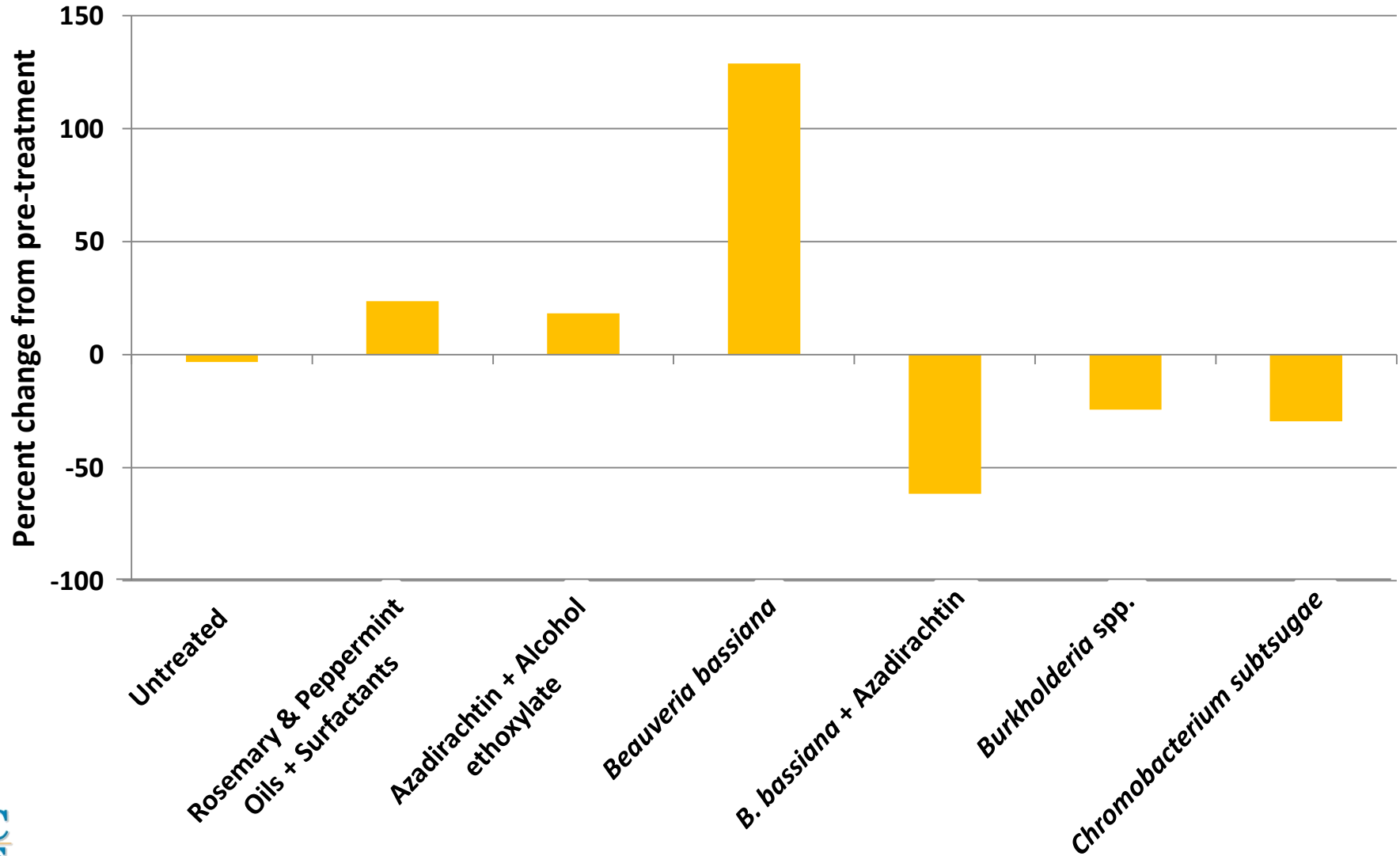


Root aphids before and after treatments



Percent change in root aphid numbers

Change after two applications



Conclusions

Conclusions

- Combination of certain products is more effective than using them alone
- Effective pest control can be achieved with non-chemical control options

Arthropod pests in zucchini



Pacific spider mite, *Tetranychus pacificus*



Western flower thrips, *Frankliniella occidentalis*



Aphids



Arthropod pests in zucchini

Silverleaf whitefly, *Bemisia tabaci*



Zucchini pest management

- 1 Untreated control
- 2 Sivanto 200 SL 14 fl oz
- 3 Sequoia 2.5 fl oz
- 4 Venerate XC 4 qrt
- 5 PFR-97 20% WDG 2 lb
- 6 I1800A 10.3 fl oz
- 7 I1800A 12.7 fl oz
- 8 I1800A 17.1 fl oz
- 9 I1800A 20.5 fl oz
- 10 VST-00634LC 25%

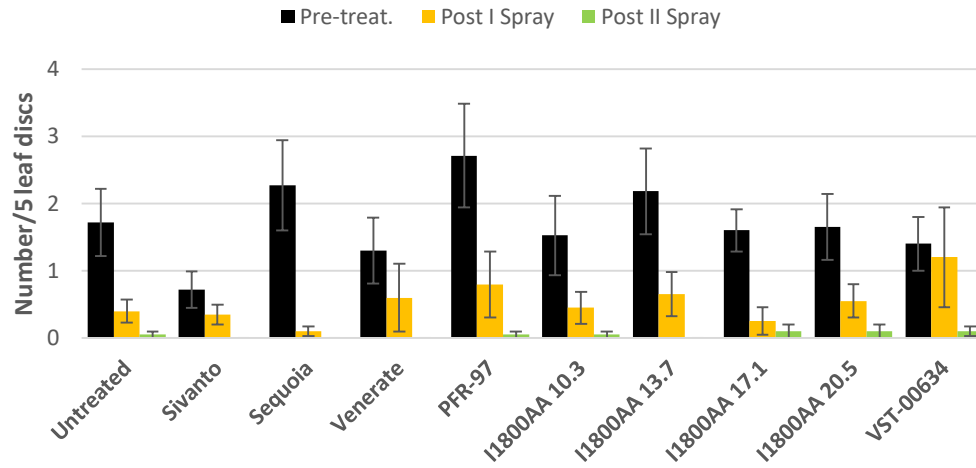
IV	5	9	1	2	8	10	3	7	6	4	75'
III	2	10	1	3	5	4	7	6	8	9	75'
II	4	8	7	9	6	3	10	2	5	1	75'
I	9	4	10	6	8	5	1	7	2	3	75'

2 beds 2 beds 2 beds 2 beds 2 beds 2 beds 2 beds 2 beds 2 beds 2 beds

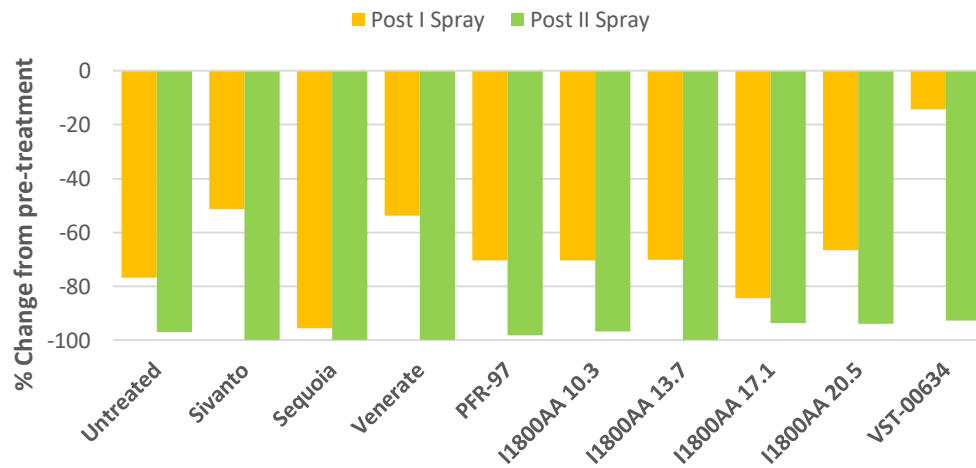
- Spray volume 50 gpa (25 gpa for treatment 10)
- Treatments were applied on 8/28 and 9/4/17 Using a tractor-mounted sprayer with 3 Teejet 8003vs flat spray nozzles
- Pest counts were made on 8/28, 9/1, and 9/8/17 from a 2 square inch disc from each of 5 leaves/plot

Zucchini pest management

Aphids



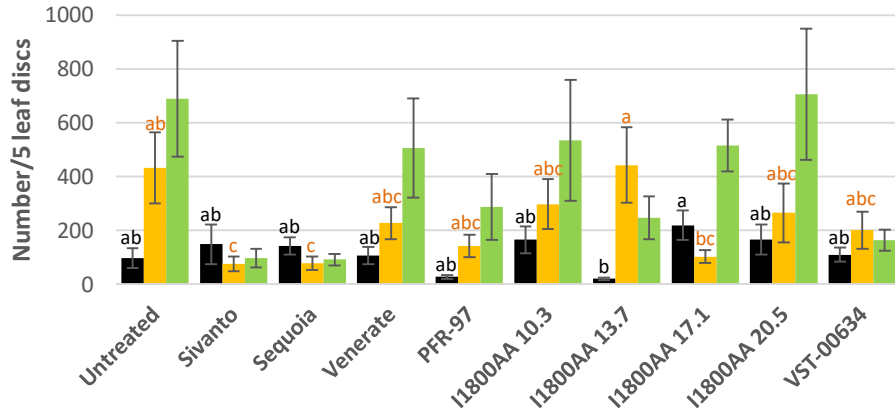
Aphids



Zucchini pest management

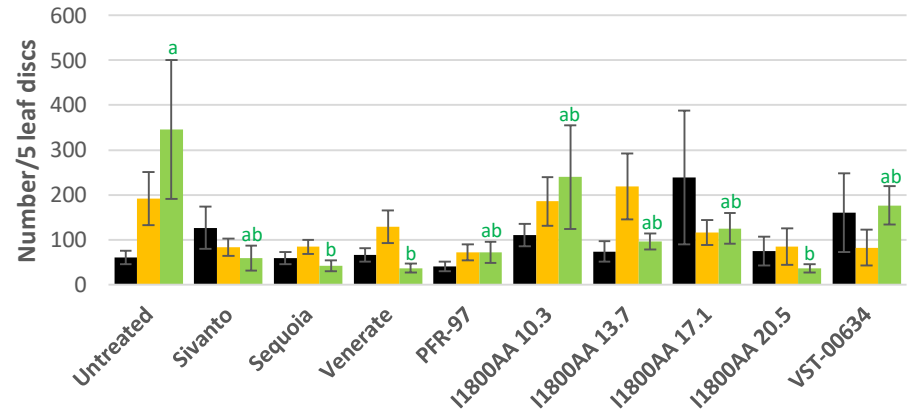
Silverleaf whitefly eggs

■ Pre-treat. ■ Post I Spray ■ Post II Spray



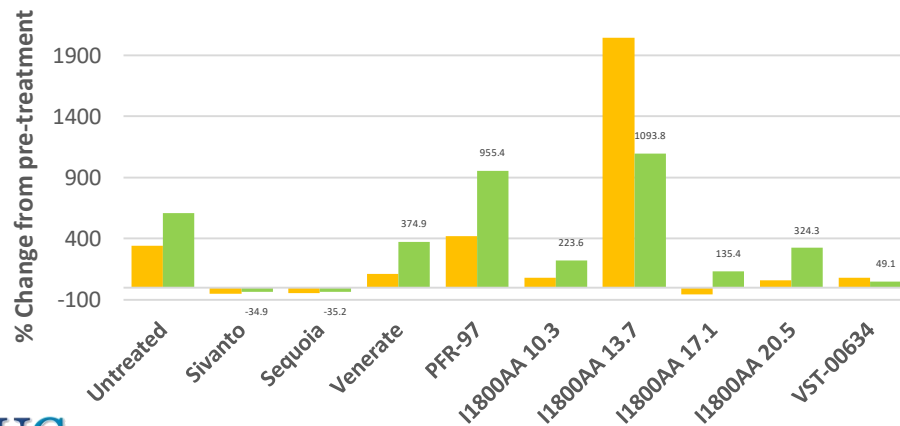
Silverleaf whitefly nymphs

■ Pre-treat. ■ Post I Spray ■ Post II Spray



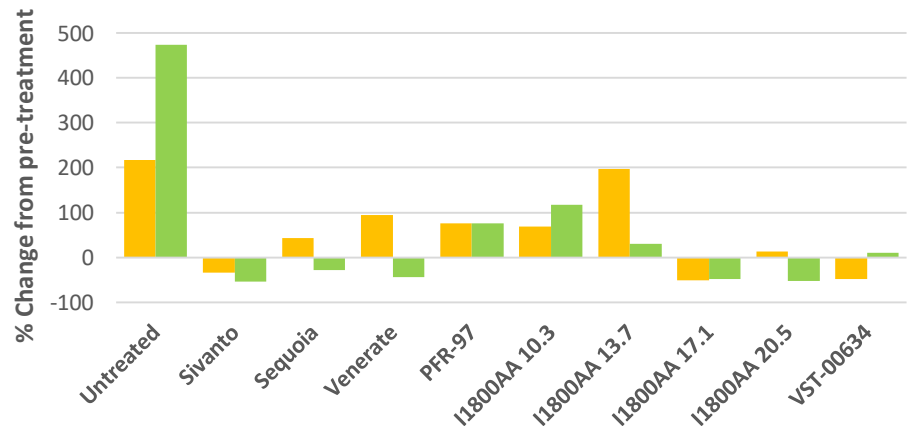
Silverleaf whitefly eggs

■ Post I Spray ■ Post II Spray



Silverleaf whitefly nymphs

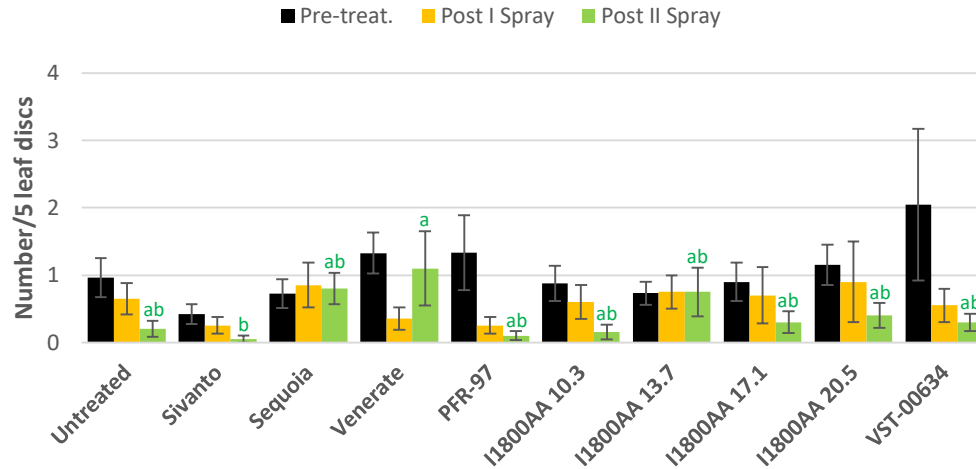
■ Post I Spray ■ Post II Spray



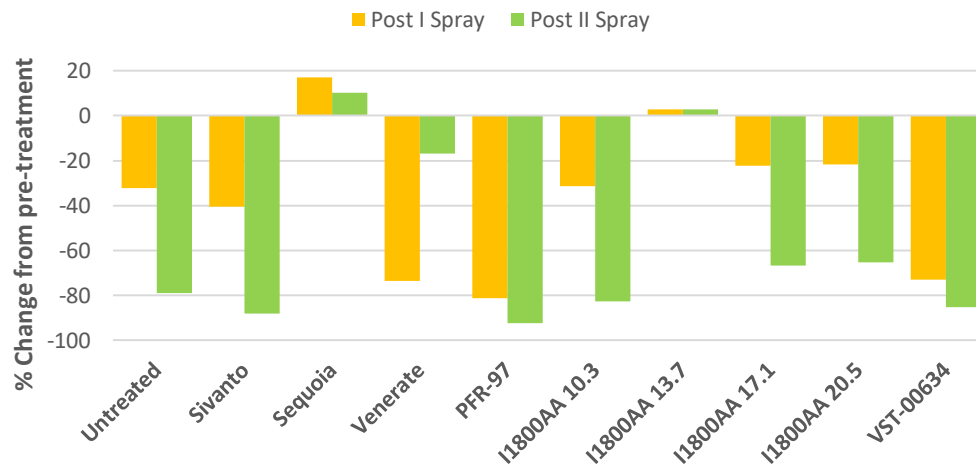
Tukey's HSD $P \leq 0.05$

Zucchini pest management

Western flower thrips nymphs



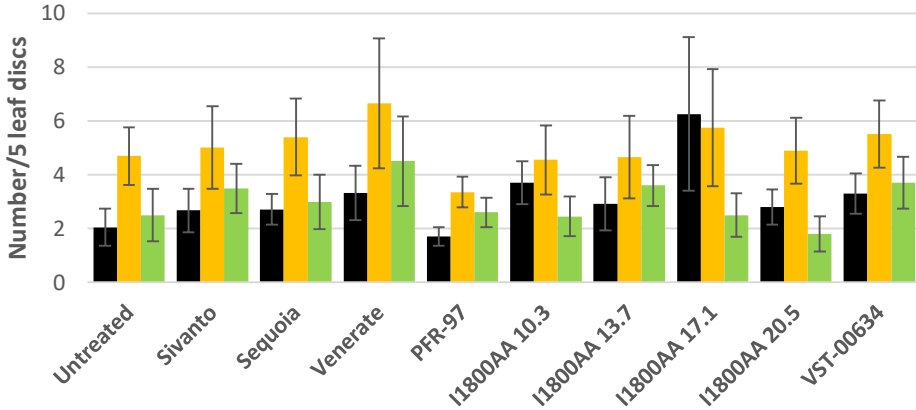
Western flower thrips nymphs



Zucchini pest management

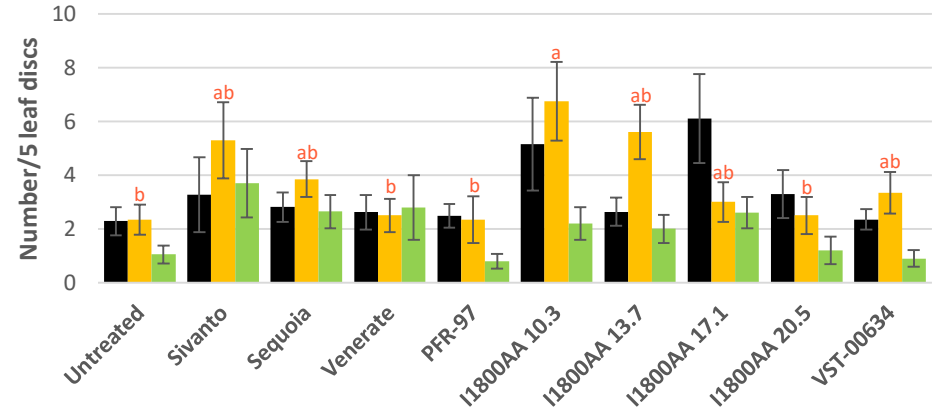
Pacific spider mite eggs

■ Pre-treat. ■ Post I Spray ■ Post II Spray



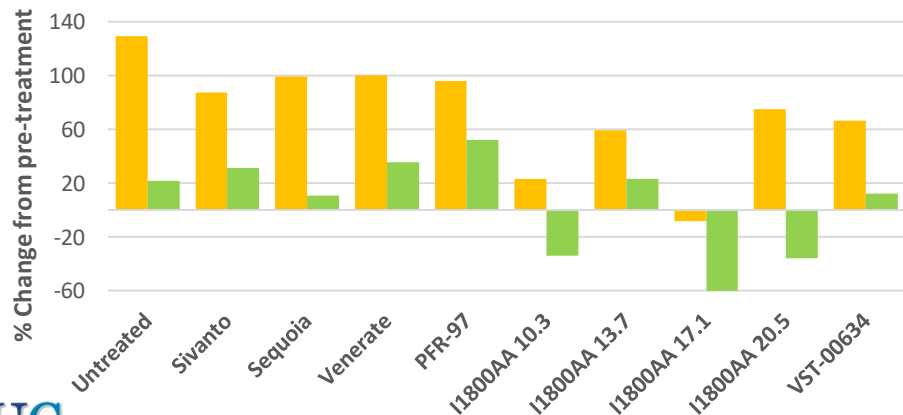
Pacific spider mite mobile stages

■ Pre-treat. ■ Post I Spray ■ Post II Spray



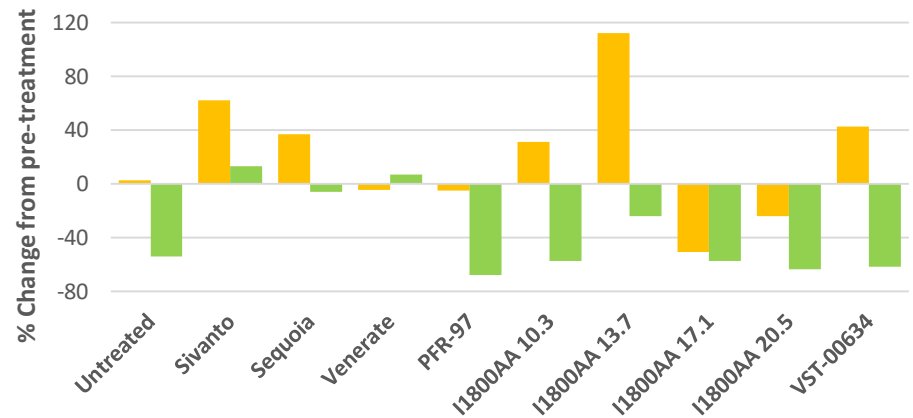
Pacific spider mite eggs

■ Post I Spray ■ Post II Spray



Pacific spider mite mobile stages

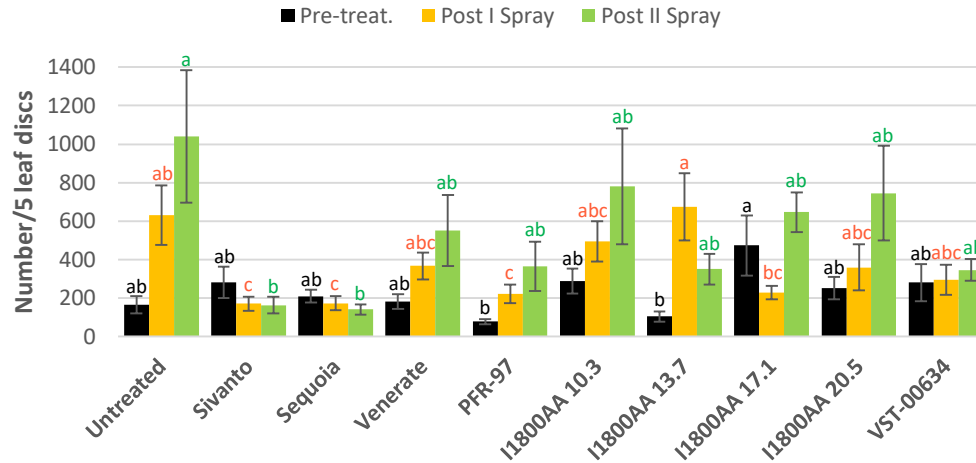
■ Post I Spray ■ Post II Spray



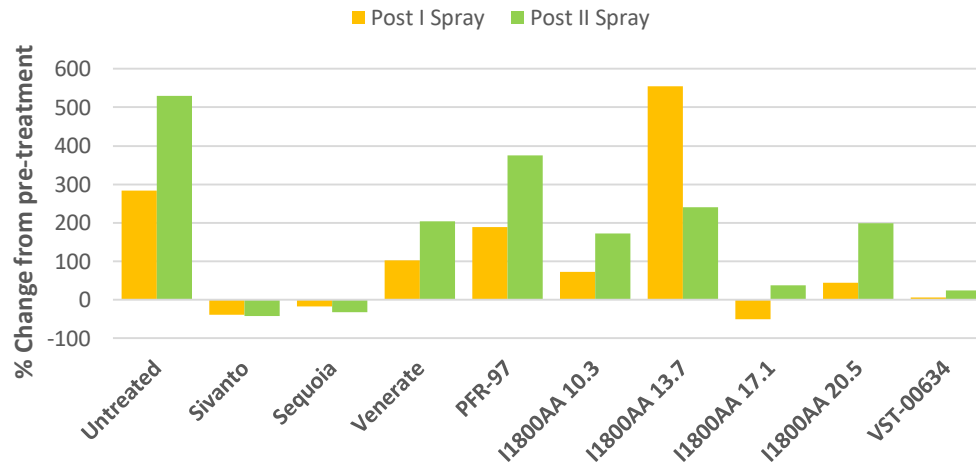
Tukey's HSD $P \leq 0.05$

Zucchini pest management

All arthropod pests



All arthropod pests



Conclusions

- Aphid, thrips, and mite numbers declined and whitefly numbers increased during the study period
- Control efficacy varied among pesticides
 - Chemical Very good
 - Microbial Moderate
 - Botanical Moderate to good
 - Biological Good
- All pesticides can play an important role in IPM

Thank you!

Growers, collaborators, and technicians
Oleg for the invitation



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