

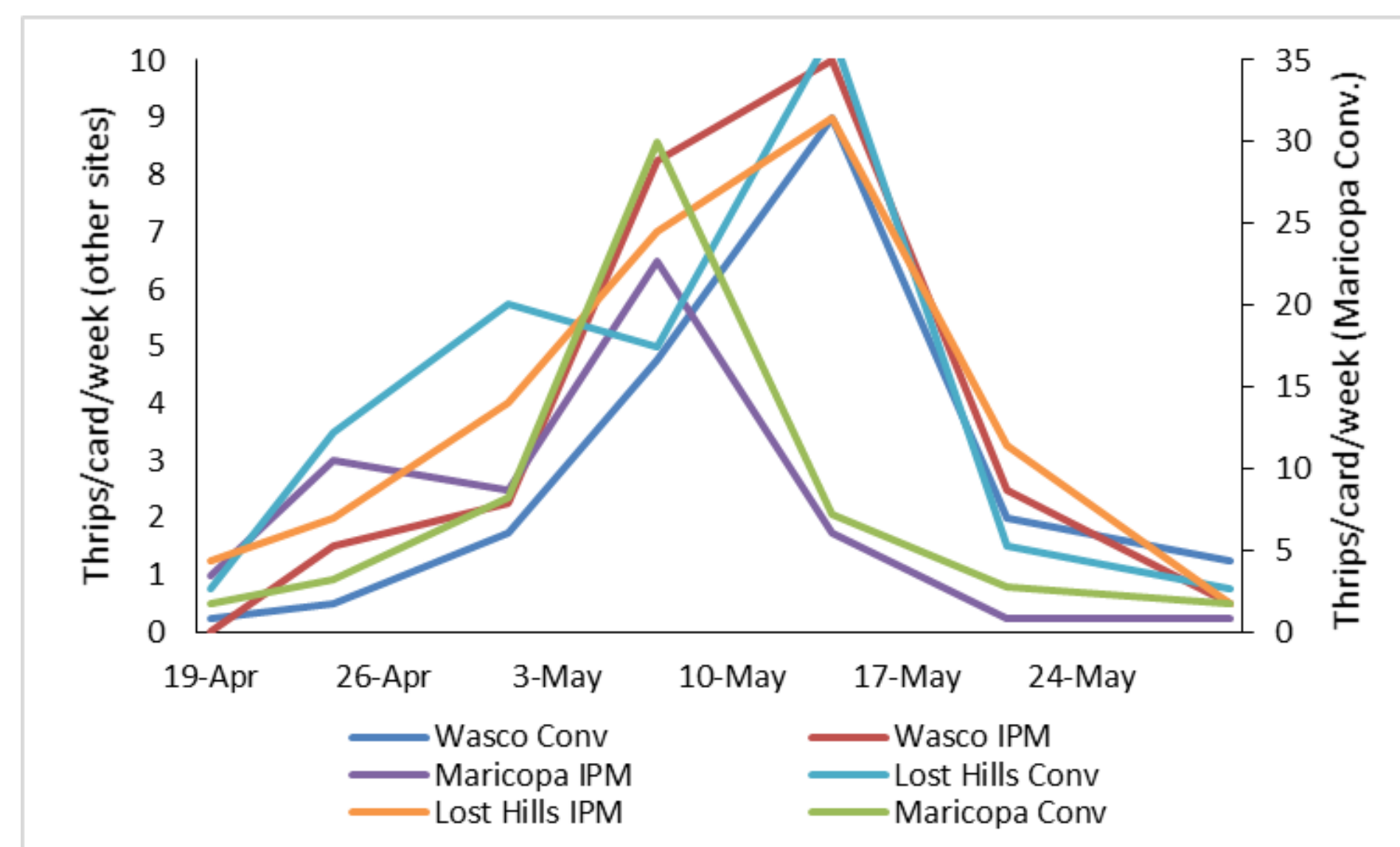
Arthropod Management in the lower San Joaquin Valley

+ Mating Disruption trials (DPR Pest Management Alliance Project)

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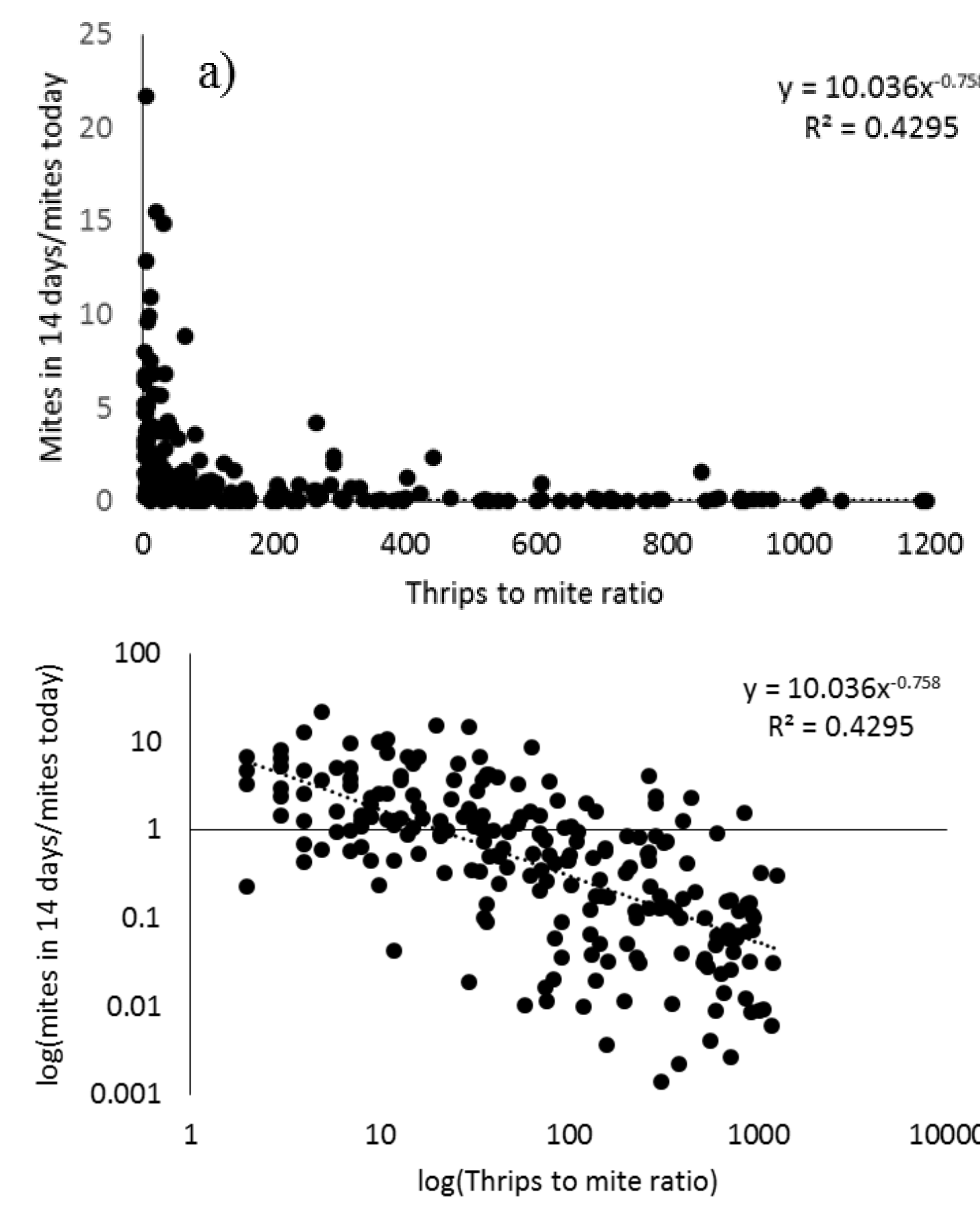
Prophylactic spring miticides

- We conducted 9 comparisons of orchards with and without May sprays over two years.
- In all 9 orchard comparisons, there were no season-long improvements in spider mite management where spring miticides were applied.
- The lack of need to spray in May can be attributed to sixspotted thrips. In all 9 comparisons (18 total orchards over 2 years), sixspotted thrips were active from mid-April until mid or late May (6 of the 18 sites are shown below).
- Miticide treatments in May should not be made unless mites are at an official threshold (25-40% of leaves infested) and sixspotted thrips are absent from sticky card traps.



Sixspotted thrips thresholds

- For the past three years we have been evaluating correlations between thrips:mite ratios in relation to change in mite density.
- Weekly thrips captures on yellow strip traps (Great Lakes IPM) were used to monitor sixspotted thrips. Traps were hung in trees using a large paper clip and binder clip. Data from 6"x12" were converted to 3"x5" card equivalents for threshold calculations.
- Mites per leaf were calculated weekly.

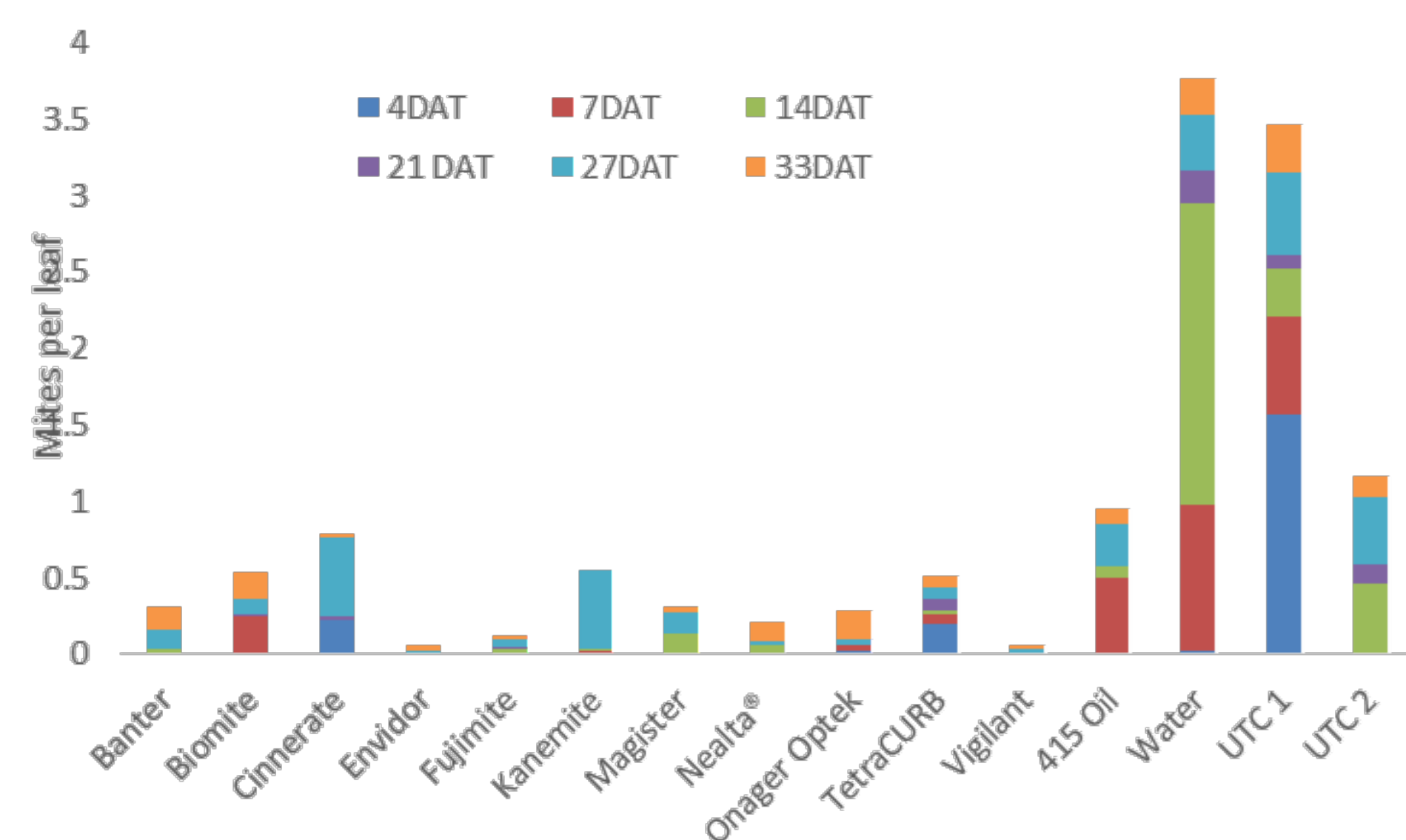


Results

- As thrips approach zero, mites increase exponentially.
- As thrips approach infinity, mites decrease exponentially.
- Data were linearized using log scales.
- 2.6 thrips/card/week on a 3"x6" card equals no change in mite density 7 days later.
- This means that if you have 1 mite per leaf on 30% of the leaves, then catching 1 thrips/card/week means there is no need to treat.

Miticide evaluations

- During 2018 we evaluated eleven different miticides when applied with 1% 415 oil for their impacts on spider mite density in Shafter, Kern County.
- All miticides significantly reduced the cumulative number of mites per leaf over 33 DAT.



- A simplified version of the model was developed using probability
 - If you have 3 thrips/trap/week = break even
 - 50% chance mites will be the same or lower in 14 days
 - If you have 6 thrips/trap/week = walk away
 - 72.7% chance mites will decrease in 7 days
 - 96.6% chance mites will decrease in 14 days



Acknowledgements-

Thank you to the Almond Board of California for continued support and funding for these research projects, and to Kern County almond growers and their PCAS for allowing us to work in their orchards. Thank you to Lauren Heppner and Eryn McKinney for assistance with data collection and processing.

Mating Disruption Evaluations for NOW (DPR PMA Project)

- Two-year project to evaluate grower standard programs with one to three insecticide applications to enhanced IPM programs including the same insecticides plus mating disruption.
- Funded by the Department of Pesticide Regulation Pest Management Alliance Program.
- Six demonstration sites in the southern and northern San Joaquin Valley.
- Each enhanced IPM orchard included one of four mating disruption products (Table 1).

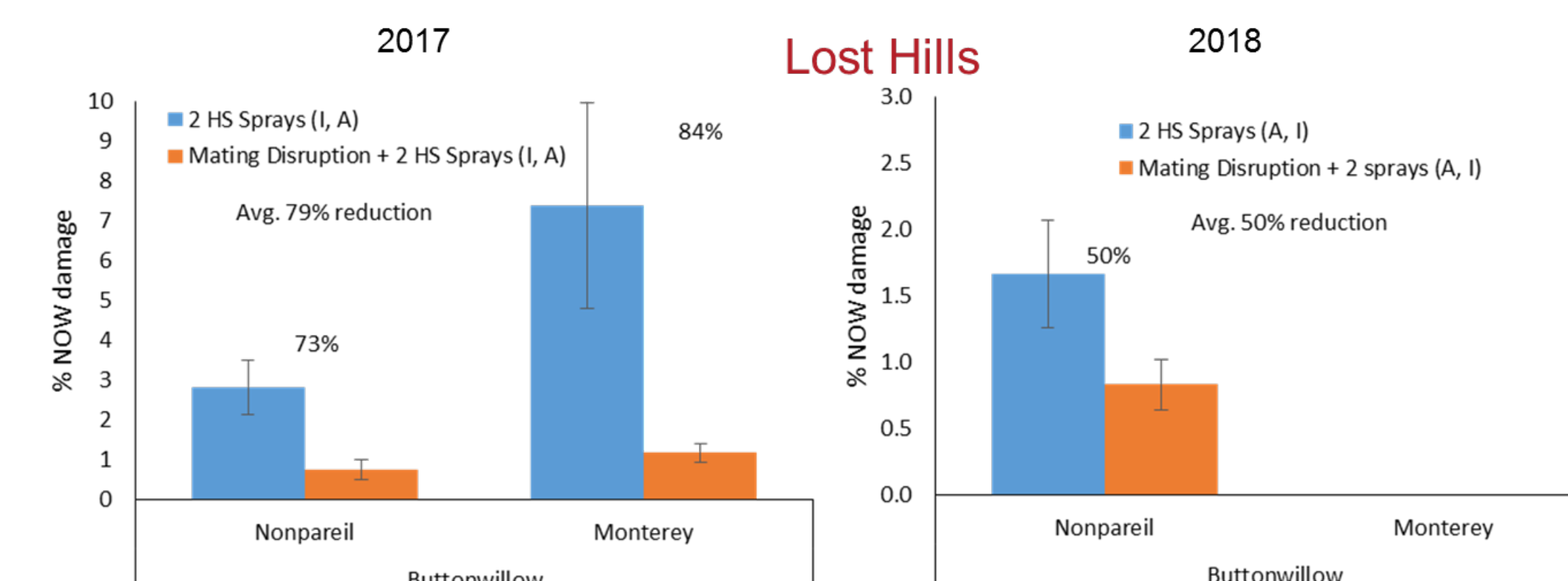
Results

- MD reduced male NOW captures in pheromone traps by 90 to 99% in all six orchards (data not shown).
- MD reduced NOW damage by approximately 50-70% over two years.
- Use of MD increased crop value at all locations over two years.
- MD paid for itself in all locations where two-year NOW damage in comparison orchards averaged >2%.
- In the Wasco orchard, MD (with no insecticides) provided improved NOW control compared to the grower standard using two insecticides.

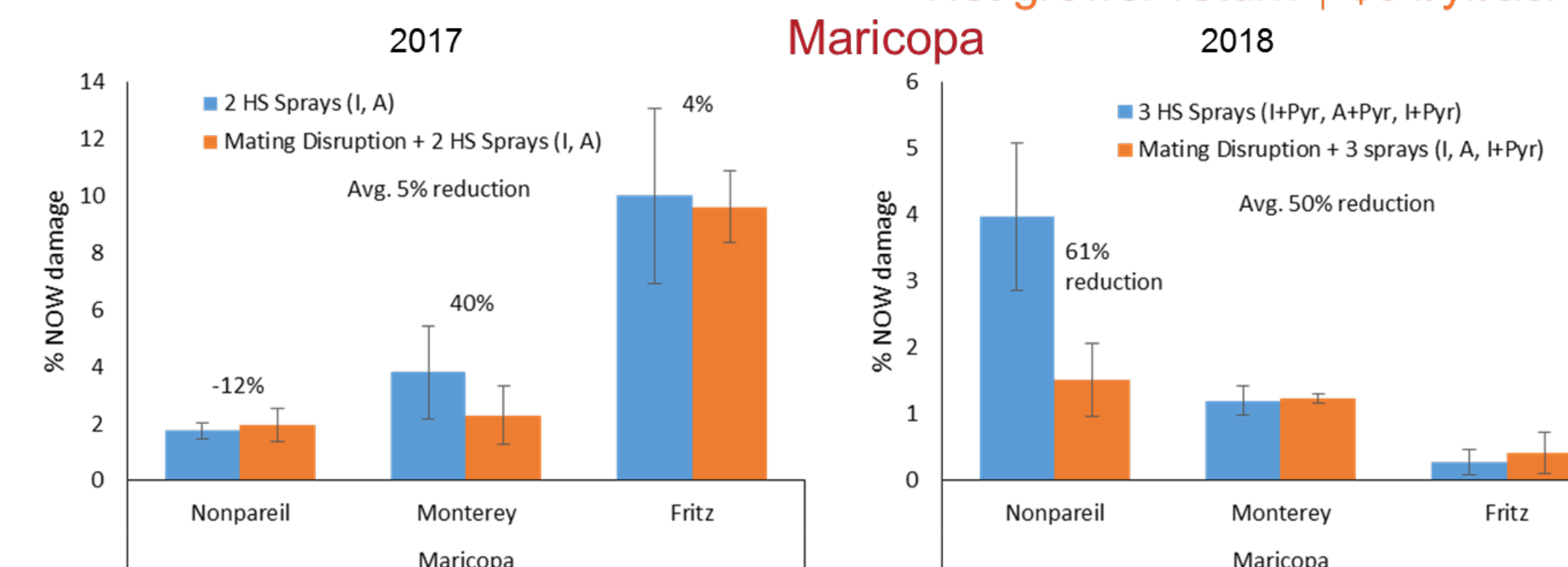
Table 1. Registered mating disruption products in California

Trade Name	Manufacturer	Dispensers per acre	Type	Release rate	Other perks/costs	Organic
Puffer NOW	Sulterra Wonderful	2	Aerosol	Static Nightly	No	No
Semios NOW	Q2 semios	1	Aerosol	Variable	Yes	No
Isomate NOW	Parsons Environmental	1	Aerosol	Static nightly	No	No
Cidetrak NOW Meso	TRECE	20 (15-28)	Passive	Static 24/7	No	Yes

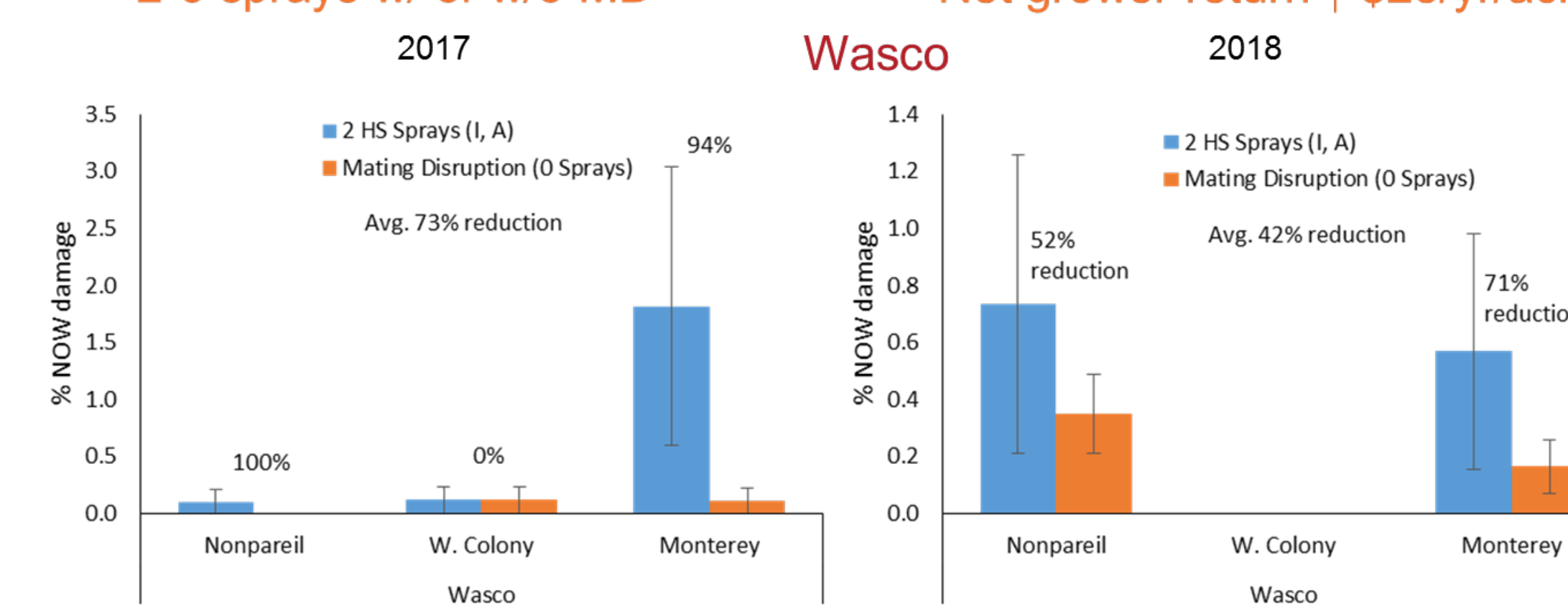
Mating Disruption for Navel Orangeworm Southern SJV Northern SJV



- Two sprays w/ or w/o MD
- Two-year damage ↓ 49%
- Net grower return ↑ \$84/yr/acre



- 100ac triangle vs. 200ac square
- 2-3 sprays w/ or w/o MD
- Two-year damage ↓ 28%
- Net grower return ↑ \$28/yr/acre



- Low pressure
- MD replaced two sprays
- Two-year damage ↓ 58%
- Net grower return ↑ \$36/yr/acre

