Organic Studies in the Rio Grande Valley: 2010-2011

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The Texas AgriLife Extension Service, and organic growers of the Rio Grande Valley are working collaboratively to improve organic production and develop pest management programs for local produce in the Rio Grande Valley. In 2010, we compared pests and natural enemies in an adjacent organic and conventional grapefruit orchard. In 2011, several trials were conducted in watermelon, onions, grapes, and citrus and currently some tests are being conducted on pepper and tomato plants. Our preliminary results indicated in 2011 there were low insect pressure across diverse vegetables. This was probably to the effects of the freezes during winter and the persistent drought throughout most of the year. Here we present our results from the 2010 and partial results from 2011.

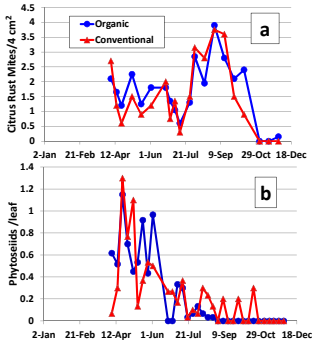
2010

Grapefruit: organic vs. conventional

In 2010 we tallied populations of citrus rust mites and their natural enemies (phytoseiid) under organic and conventional management programs, significant differences were not found for the numbers of rust mites (Fig. 1a) or phytoseiids (Fig. 1b). Also, damage differences on fruit russeting were not observed under these two programs. However, the amounts of pesticides under the organic program (58.5 lbs/A) were double than the amounts used in the conventional (27.5 lbs/A) (Table 1).

Table 1. Compounds used under Organic and management programs in 'Rio Red" grapefruit by one grower in 2010.

Damage caused by citrus rust mite



Citrus rust mite

Predatory mite

Figure 1. Relative abundance of citrus rust mites and predacious phytoseiids in organic and conventional, "Rio Red" grapefruit orchards

2011

Watermelon: whitefly and aphid

Watermelon tests were conducted during the spring of 2011. Our treatments included two sprays of each Oroboost® (citrus oil), Surround® (Kaolin), and the water control. Only whiteflies and aphids were observed in the two different sites where the trials were conducted.

Whiteflies and aphis are sucking insects, if not controlled can severely affect many crops. In addition both species are important vectors of virus in many vegetables.

The whitefly population was severely affected by Surround® compared to the water control. While, Oroboost® did not greatly affect white flies. Also, significant differences on white fly densities were found on April 22, and May 9 (Fig. 2). Results showed that aphid populations were not affected by the Surround ® sprays (Fig. 3).

However, Oroboost ® had a negative effect on the aphid population and, it maintained aphid populations below the water control treatment during the whole period of the study.

Adult & nymphs Whitefly

Alate aphid

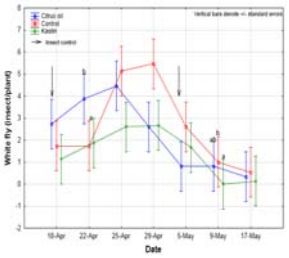


Figure 2. Mean whitefly population (±SEM) in watermelon

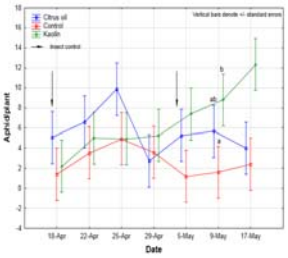


Figure 3. Mean aphid population (±SEM) in watermelon

Onion: thrips

Thrips tabaci is a small insect (1 to 3 mm) that causes damages during feeding, rasping the epidermis of onions. In addition this insect is the most important vectors of Iris Yellow spot virus. Two different studies were conducted.

First we evaluated the efficacy of Oroboost® and Pyganic® (pyrethrin) to control thrips in two organic grower sites; two sprays of each of them were conducted in April 18 and May 2, 2010 (Fig. 4). Onion thrips were effectively controlled by the first Pyganic® spray however, Oroboost ® did not provide an adequate control.

Onion thrip

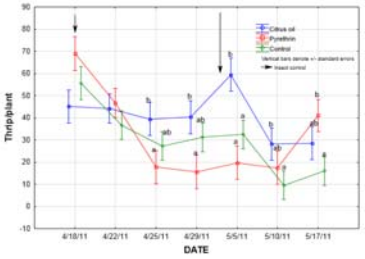
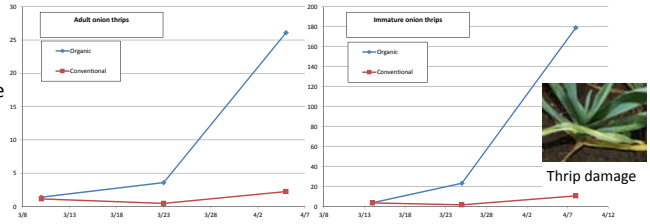


Figure 4. Mean (±SEM) onion thrip population of two organic farms in the Rio Grande Valley.

The second study compared population of thrips in large conventional and organic farms. Although, numbers in the organic were higher than conventional, the organic grower was profitable and the thrips did not cause large damage in the onions (Fig. 5).



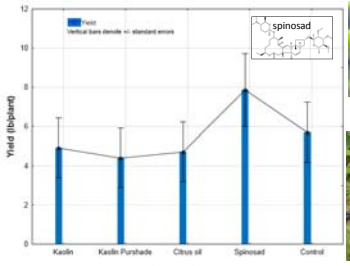
Thrip damage

Figure 5. Immature and adult onion thrip densities in organic and conventional commercial orchards in the Rio Grande Valley.

Black Spanish organic grapes

The vineyard studied was a two years old Black Spanish (*Vitis aestivalis*) grapes located in Monte Alto. To prevent damage from leaf defoliators, leafhoppers or mites registered organic pesticides were used in this vineyard in two occasions. The products used were Surround® (kaolin), Purshade® (kaolin), Oroboost® (citrus oil), and Entrust® (spinosad).

The only insect causing severe defoliation in this vineyard was the leaf cutting ant (*Atta texana*). Leaf cutting ant nests were not found inside the vineyard; nests might had been in adjacent neighbor's field. Boric acid (Borox) used by grower might have caused a small reduction on the ants however, this was not observed in the field. At harvest time we evaluated grape yield. The Entrust ® treatments had the highest yield although no significant differences were found among all the treatments (Fig. 6).



Leaf cutting ant

Black Spanish grapes

Figure 6. Mean yields (±SEM) per vine in a 2-yr old Black Spanish organic vineyard.

Acknowledgments

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