

Chilli Thrips Management in Organic Strawberry Using Biopesticides and Predators.

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Summary

A pest management program including biopesticides and predatory mites needs to be identified to manage chilli thrips, *Scirtothrips dorsalis* Hood, in organic strawberry. Therefore, 4 rotation programs were tested in organic strawberry plots as follows: 1) Entrust > Azera > Entrust > Azera; 2) BoteGHA > BoteGHA > *A. swirskii* > BoteGHA; 3) Captiva Prime > *A. swirskii* > PFR-97 > PFR-97; 4) Captiva Prime > *A. swirskii* > BoteGHA > BoteGHA. Treatments were compared to non-treated control strawberry plots. Average chilli thrips count, plant damage rating, and marketable fruit yield (gm) were collected from 2nd December 2024 to 1st February 2025. Results indicated that all 4 rotation programs significantly suppressed plant damage from chilli thrips when compared to non-treated control plants. However, there were no differences among treated and control plots with regards to average chilli thrips numbers.

Background

Efficacy of botanicals such as OMRI listed Captiva Prime (capsicum oleoresin extract) and predatory mite, *Amblyseius swirskii* Athias-Henriot in suppressing both the adult and larval chilli thrips has been documented in greenhouse strawberry studies. It is unknown how well these treatments might work in a rotation program for organic strawberry growers. Therefore, the objective of this experiment was to determine the effectiveness of four rotation programs including OMRI listed biopesticides. Our hypothesis was that the rotation program containing spinetoram (Entrust), will perform poorly compared to other pesticide treatments due to rapid resistance development to spinetoram in chilli thrips.

Methods

In early October 2024, at UF/IFAS GCREC Wimauma, FL, strawberry transplants (cultivar 'Florida Brilliance') were planted in a randomized complete block design with 4 replications of treatment and control plots. Four rotation programs were tested. Each plot contained 15 strawberry plants. The insecticidal sprays were applied at maximum label rate using backpack sprayers at 50 GPA, set at 40 psi. Predatory mite, *A. swirskii* (~30 adult mites) were hand-released/plot within 24 h of biopesticide application in Programs 2, 3, & 4. Both, pre-and-post treatment sampling was done by randomly collecting 8 trifoliates for counting chilli thrips adult and larvae/plot on 6 sampling dates. A visual damage rating (0-5 with 5 as most damaged) was also given to each plot on 5 sampling dates. Marketable fruit (gm) was also collected from entire plots.

Results

Plant damage rating

The rotation program of insecticides had a significant suppressive impact on strawberry plant damage from chilli thrips feeding ($F_{4,1328} = 20.77$, $P < 0.0001$). All insecticide treated plots, irrespective of the rotation program, had lower plant damage compared to the non-treated control plants.

Chilli thrips numbers & fruit yield

The rotation programs of various insecticides had no impact on chilli thrips adult or larval count and fruit yield ($F_{4,87}=0.23$, $P=0.92$; $F_{4,87}=0.9$, $P=0.47$; $F_{3,21}=0.34$, $P=0.80$, respectively), compared to non-treated control plots. This could be attributed to the season-long low number of chilli thrips on all plots and lack of fruit formation beyond December 19th 2024, due to poor plant nutrition.

Table 1. Mean (\pm SE) damage rating in treated and non-treated organic strawberry plants from chilli thrips feeding.

Treatment	Mean (\pm SE) Damage rating
Rotation 1	0.64 \pm 0.05
Rotation 2	0.67 \pm 0.05
Rotation 3	0.62 \pm 0.05
Rotation 4	0.56 \pm 0.04
Control	1.08 \pm 0.07*

*Significantly different

Table 2. Mean (\pm SE) chilli thrips adult and larval count on insecticide treated and non-treated organic strawberry plants.

Treatment	Mean (\pm SE) Chilli thrips adult	Mean (\pm SE) Chilli thrips larvae
Rotation 1	1.28 \pm 0.23	2.80 \pm 1.01
Rotation 2	1.13 \pm 0.27	2.08 \pm 0.51
Rotation 3	1.25 \pm 0.31	3.17 \pm 1.20
Rotation 4	1.30 \pm 0.29	1.83 \pm 0.62
Control	1.5 \pm 0.37	2.96 \pm 0.87

Table 3. Mean (\pm SE) marketable fruit yield (gm) in insecticide treated organic strawberry plants on December 2nd and 19th 2024.

Treatment	Mean (\pm SE) Fruit yield (gm)
Rotation 1	63.26 \pm 17.05
Rotation 2	52.40 \pm 13.26
Rotation 3	50.75 \pm 4.98
Rotation 4	48.44 \pm 12.87
Control	43.84 \pm 15.15

Takeaways

- The application of any one of these insecticide rotation programs can significantly suppress plant damage rating from chilli thrips feeding at infestations of 1 – 3 adults or larvae per eight strawberry trifoliate.

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