

MYOPORUM THRIPS CONTROL

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The genus *Myoporum* (Myoporaceae), native to Australia and New Zealand, contains several popular ground cover and tree species that are widely planted in Southern California because of their aesthetic beauty, minimal management needs, low water requirement, and lack of pests. Because of its hardiness, *Myoporum* is also considered by some to be an invasive species threatening natural habitat areas in California. Since 2005, an exotic species of thrips new to the U.S. is causing great damage to landscape plantings and nursery stock of *Myoporum* in Los Angeles, Orange, San Diego, Santa Barbara, and Ventura counties. Currently two species of *Myoporum* are affected, *M. laetum* and *M. 'Pacificum'*. Live thrips and damage have not yet been observed on *M. parvifolium*, another common low growing *Myoporum* species.

In general, little is known about this pest of *Myoporum*. The invasive thrips has only recently been described in the scientific literature from samples collected in California and sent to Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO). It is a new genus, *Klambothrips*, and the new species name is *Klambothrips myopori* Mound and Morris (Mound and Morris 2007). It does not yet have a common name. Damage to *Myoporum* by this thrips is characterized by gall-like symptoms and distortion of new leaves. Terminal growth can be severely stunted and leaf curling or folding with thrips populations' within the folds is common. This characteristic is similar to Cuban laurel thrips, *Gynaikothrips ficorum* Marchal, on *Ficus* species in that reaching the populations within the folds with pesticides can be problematic.

Klambothrips myopori was first observed in Southern California in Orange County in 2005. CDF A declared the thrips a "Q" rated pest and endeavored to eradicate the pest from landscape plantings using Merit (imidacloprid). However, time and funding lacked and resources were diverted to infestations of more serious invasive pests like *Diaprepes*. Therefore, landscape plantings of *Myoporum* became more heavily infested with thrips over time, and the aesthetic quality of the plantings waned. No further efforts to eradicate this pest were attempted by CDF A. In late 2006, we performed an efficacy trial using three products against the *K. myopori* in the hopes of identifying products that may be used in management of this pest.

Methods

Host Plant Site and Experimental Design: A landscape setting of *Myoporum 'Pacificum'* groundcover alongside a caddy shack at a golf course in Oceanside, CA was used for the trial. The 22 meter by 1.5 meter planting was separated into sixteen 1.2m² plots to accommodate four treatments with four replicates. Since the treated area was linear, a completely randomized design was used to assign treatments to each plot, and a buffer area between blocks that may have received drift was not evaluated. The thrips infestation in this planting was moderate to heavy.

Treatments and Application Method: Treatments included a control (untreated) and foliar applications of three selected pesticides: Avid (abamectin) @ 8floz/100 gal, Merit 21 (imidacloprid) @ 45ml/100 gal, and Conserve (spinosad) @ 200ml/100 gal. No surfactants were used in this trial. Treatments were applied twice (on September 30 and October 13, 2006) using a backpack sprayer with a flat fan nozzle at 25-35 psi.

Sampling and Analysis: Thrips populations were assessed through samples consisting of six terminals (10cm) arbitrarily taken from the center of each plot. These were bagged and taken back to the laboratory for assessment of the number of live thrips/sample/plot. In the laboratory, the terminals were placed in 85% alcohol in a quart sized food container, allowed to sit for several minutes and then shaken to dislodge the thrips from the twisted foliage. The alcohol was then poured through fine mesh screening material, which was then placed under a stereomicroscope to count the number of thrips. A t-test for location was used to test treatment means against a fixed value ($m\mu =$ control mean) on each sample date.

Observations were made to identify any biological agents that may be affecting thrips populations. Biological agents identified were counted in the sampling procedure above. In addition to the number of thrips per sample, a rating of the damage caused by the thrips was assessed at selected dates. A damage scale from 0-10 was used to assess the level of damage per terminal on a random group of terminals in each plot, 0 = 0% of the leaves on the terminal growth were damaged and 10 = 100 % of the leaves were galled and damaged. A pointer was placed at random to six different positions within the block and a rating was given to the terminal that was touching the pointer. Data were analyzed using the Mann Whitney U-test ($\alpha = 0.05$); each treatment verses the control on each date.

Results and Conclusions

Spinosad (Conserve) significantly reduced the mean number of thrips compared to the control between Sept 13 and Oct 17 (Figure 1). Imidacloprid (Merit) significantly reduced the mean number of thrips compared to the untreated control between Sept 26 and Oct 11. Abamectin (Avid) did not reduce the mean number of thrips compared to the control on any date. The amount of damage observed on *Myoporum* declined over time in all treatments during the length of the trial. Statistically significant reductions in the number of damaged terminals were observed following the second treatment application on Sept 13 (Figure 2). Minute pirate bugs, *Orius tristicolor* (White), natural predators of thrips, were observed in almost every sample (Figure 3) indicating that predation was occurring by a native predator on this exotic pest. The mean number of *Orius* per sample date remained stable in the untreated control throughout the trial. In contrast, the mean number of *Orius* per sample date declined over time on treated foliage and no *Orius* were observed in imidacloprid treated foliage on the last two sample dates.

The data indicate that two applications of imidacloprid or spinosad will reduce the number of thrips and significantly reduce the amount of damage to infested *Myoporum*. The *Myoporum* used in this trial were very heavily infested which may explain why abamectin (Avid) did not appear to reduce thrips numbers as much as the imidacloprid or spinosad. However, abamectin (Avid) did reduce the damage over time, which suggests that there was some effect on the thrips' population dynamics. For better success, a curative or preventative treatment of thrips products should be applied earlier in the population cycle, or earlier in the year when population levels are initially lower.

All pesticide treatments appeared to have an effect on the number of minute pirate bugs observed in the samples. However, with the exception of the imidacloprid treated foliage, *Orius* were always present. The data suggest that imidacloprid has a detrimental effect on minute pirate bugs over time, taking them to extinction. It is not clear, however, whether the effect comes directly from treated foliage or feeding on treated foliage, or whether it comes indirectly from feeding on treated thrips. Further investigation is needed to answer that question.

While we report that a great number of the predatory *Orius tristicolor* were observed feeding on *K. myopori* in our trials, a significant reduction of thrips numbers or damage to terminals was not observed (see untreated controls, Figures 1 & 2). The small reduction in damage to untreated plants observed over time indicates that there may be seasonal variation and some degree of recovery by infested plants. Control of *K. myopori* and reduction in damaged *Myoporum* will most likely involve the use of insecticides. However, other beneficials, resistant cultivars, and other IPM methods may be available in the future.

More trials are planned using new and older chemistries in the near future on both landscape plantings and in the nursery.

References Cited

Mound, L. A. and D. C. Morris. 2007. A new thrips pest of *Myoporum* cultivars in California, in a new genus of leaf-galling Australian Phlaeothripidae (Thysanoptera). *Zootaxa*. 1495: 35-45.

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Figure 1. The mean number of *Klambothrips myopori* per sample of *Myoporum* treated with selected insecticides. Treatments are compared to the untreated control on each date (one sample t-test, * < 0.05, ** < 0.001, * < 0.0001).**

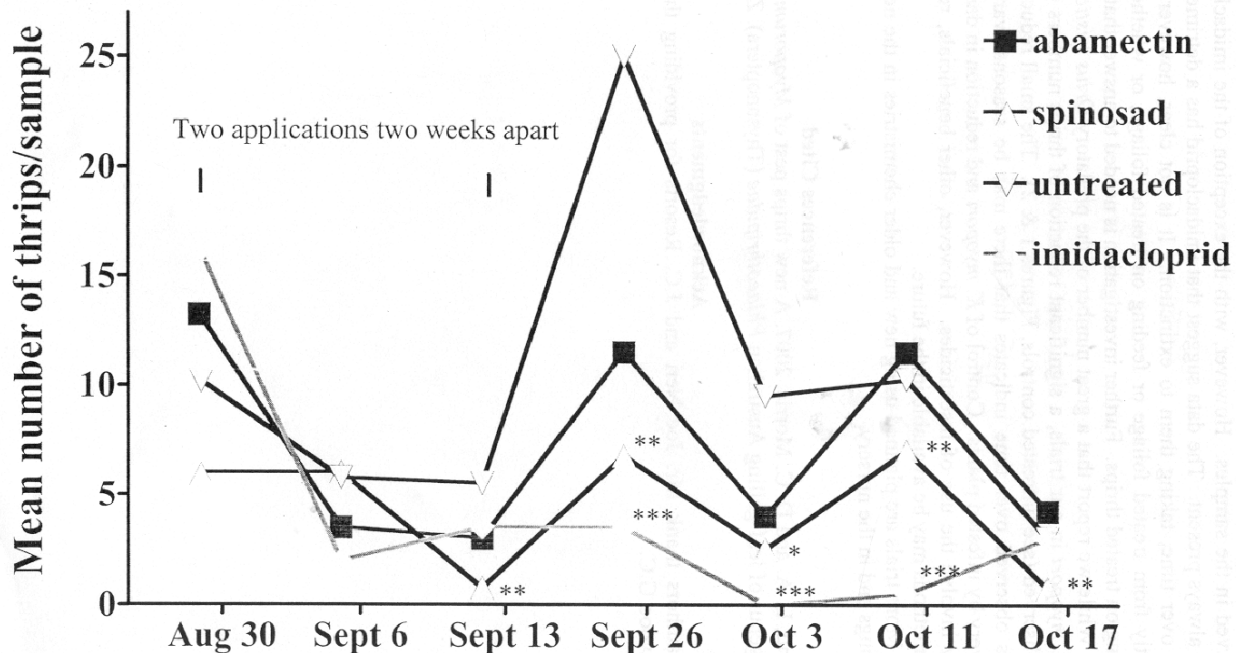


Figure 2. Mean (\pm SE) damage estimates of *Myoporum* leaves distorted by the *Myoporum* thrips, *Klambothrips myopori* (Mound and Morris). A single sample consisted of 4-6 point samples from each treated block. Terminals touching the point were assessed for the amount of damage on a scale from 0-10. Damage rating scale: 0 = no damage; 1 = 10% of leaves distorted; 10 = 100% of leaves distorted. Treatments were statistically compared to the control on each date by the Mann Whitney U-test (NS = not significant, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$).

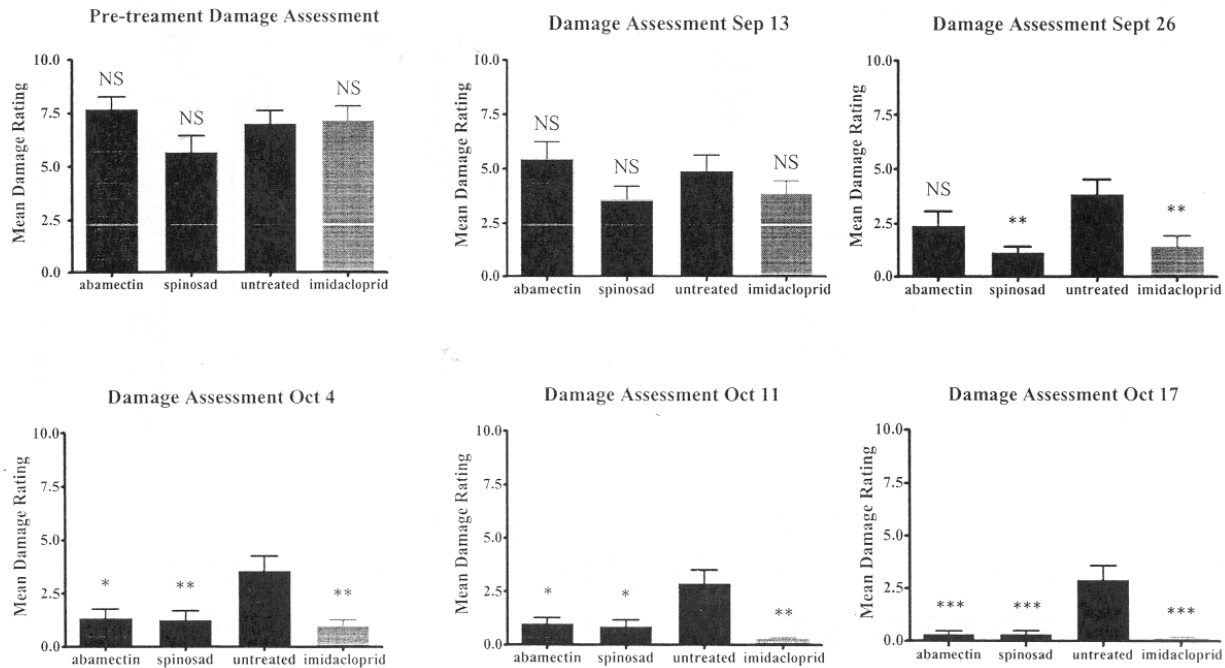


Figure 3. Mean number of Minute Pirate Bugs, *Orius tristicolor*, per sample of *Myoporum* treated with selected insecticides

