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IPM Approaches for the Management of Chilli Thrips and Crapemyrtle Bark Scale

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Summary

Both chilli thrips (*Scirtothrips dorsalis*) and crapemyrtle bark scale (*Acanthococcus lagerstroemiae* (Kuwana) are among the top insect pests challenging the ornamental horticulture industry both in the nursery production and landscape management of ornamental species. The regional integrated pest management (IPM) team works have been conducted over the past fifteen years for chilli thrips and five years for crapemyrtle bark scale to gain knowledge on their biology and test the effectiveness of various cultural, biological and chemical management options. In this presentation, basic biology and current management recommendations are discussed to provide options for industry pest management professionals when considering a programmatic approach to manage these two pests.

INTRODUCTION

Both chilli thrips (*Scirtothrips dorsalis*) and crapemyrtle bark scale (*Acanthococcus lagerstroemiae* (Kuwana) are among the top insect pests challenging the ornamental horticulture industry both in the nursery production and landscape management of ornamental species.

CHILLI THRIPS

Over the past decade, chilli thrips has become more established in the southeastern U.S. economic losses due to this pest have been reported from many sectors of the horticultural industry such as landscape ornamental plants, production nurseries (of ornamentals, vegetables, and fruit trees), and field grown vegetables and fruits (Fig. 1).

Figure 1. Chilli thrips (left) in comparison of size and shape with western flower thrips (right).

Among a large number of ornamental species that are suitable hosts, Knock Out roses, cleyera, camellia, bottle brush, duranta, distylium, Indian hawthorn, ligustrum, pomegranate, and viburnum are some of the woody species that are more susceptible. Infestations on herbaceous plants such as begonia, coleus, snapdragon, zinnia, coreopsis and verbena have also been reported.

Chilli thrips is very small, only 0.016 to 0.024 inch in length. Compared with the more common western flower thrips, chilli thrips are about one-quarter of the size of western flower thrips, with a more bulged abdomen (Fig. 1). All thrips inhabit secluded areas on plants, such as unopened flower and terminal buds, thus reduces exposure to insecticide applications. They also superficially resemble some other thrips species that, if mistaken, may result in poor control because the insecticides selected may not be efficient against chilli thrips. Damage usually shows up on young leaves first but both young and old leaves can be bronzed, curled and distorted, which may look like herbicide burn or leaf rust. Severe infestation can defoliate or stunt plant growth (Fig.2).

CRAPEMYRTLE BARK SCALE (CMBS)

Known scientifically as *Acanthococcus lagerstroemiae* (Kuwana), the crapemyrtle bark scale is a relatively new insect found principally on crapemyrtles (*Lagerstroemia* spp.) across the Southeast and is a member of the bark or felt scale family (Hemiptera: Eriococcidae). Native to Asia, CMBS was first noticed in a north Dallas, Texas, suburb in 2004. By 2019, the insect had been reported from twelve states. This exotic scale causes heavy honeydew deposits followed by a disfiguring layer of dark black sooty mold which severely diminishes the landscape value of this important ornamental plant. Heavy infestations of CMBS reduces the size of panicles, delays flowering, and kills small twigs on crapemyrtle. In its native range, this bark scale was reported infesting plants from 16 genera in 13 families, many of

which are economically important crops, most notably persimmon, pomegranate, fig, and blackberry. In the U.S., the scale has been recorded feeding on American beautyberry (*Callicarpa americana*) and St. John's wort (*Hypericum perforatum*) in the landscapes. Host susceptibility experiments conducted at TAMU with different varieties of crapemyrtles did not suggest any resistance or tolerance among *L. indica* and its hybrids (Wang et al., 2018).

Figure 2. Foliage injury symptoms on various woody ornamental species and herbaceous (pepper) crops of economic importance.

This scale is easy to identify because it is the only bark scale know to occur on crapemyrtle. The adult females appear as white or gray felt-like encrustations on small twigs to large trunks, with early infestation often appearing near the leaf nodes of a branch, and bleeding pink when squeezed (Fig. 3). Up close, CMBS is white to gray in color and approximately 2 mm (0.08 inch, a bit longer than the thickness of a dime) in length (Wang et al., 2016). Careful examination may reveal dozens of pink eggs or crawlers under some of the larger white scale covers. Most gardeners will be alerted to CMBS by black sooty mold which appears on the bark.

The presence of sooty mold may confuse the diagnosis since that is also commonly associated with a significant aphid or whitefly problem. The distribution of CMBS is frequently updated on https://www.eddmaps.org/cmbs with future distribution range closely related to the distribution range of its primary host, crapemyrtles (Wang et al., 2016). Landscape professionals and homeowners are encouraged to report new infestation to local extension offices so its spreading can be monitored.

The USDA APHIS has determined that a CMBS quarantine was not justified because it is already established in the U.S. Therefore, no targeted surveys for the crapemyrtle bark scale have been conducted or are planned.

However, in some states (Arkansas, Louisiana, Oklahoma and Tennessee), there is currently a stop-sale on crapemyrtle whenever this scale insect is found during routine inspections of nurseries and retail sites as a quality pest, not as a regulated quarantine pest.

Figure 3. Crapemyrtle bark scale is easy to identify on infested trees with a close inspection and will bleed pink when pinned with an object.

IPM OPTIONS FOR MANAGING CHILLI THRIPS

The key to managing chilli thrips is to detect and treat the pest before a high population builds up. Chilli thrips prefers to feed on tender plant tissue, thus more outbreaks have been reported in mid-May and/or September to early October when many landscape plants having their new growth. Therefore, it is important for landscape managers or home gardeners to periodically check plants during these months. Tapping foliar terminals over a sheet of white paper will dislodge thrips that can be examined with a hand lens.

In production nurseries, because plants are routinely pruned to promote branching and new growth, chilli thrips can be problematic throughout the growing season. It is critical for nursery growers to be familiar with early damaging symptoms such as leaf curl and distortion of susceptible plant species or setting up sticky cards/tapes to

monitor chilli thrips population in high risk crops on a weekly basis.

For cultural practices, sanitation is important for both production and landscape management of this pest. Cleaning up debris from infested plants and removing weeds are important because chilli thrips overwinter as adults in leaf litter or weeds. This is especially critical for nurseries that have had chilli thrips infestations in the past. When treating a local outbreak, either in nursery or landscapes, severely infested branches should be cut and bagged for disposal. We have also found that high nitrogen and phosphorus contents in plant leaves contribute to higher numbers of chilli thrips on Knock Out roses. Applying fertilizer lightly, such as a split application at the recommended rate, may avoid promoting chilli thrips reproduction.

The use of pyrethroids, organophosphates or other broad-spectrum insecticides is not recommended for controlling chilli thrips in landscape plants because of their potential effects on beneficial species, including minute pirate bugs (O*rius spp.*), lacewings and predatory mites or spiders that help prevent outbreaks of chilli thrips as well as other pests.

The AgCenter and Univ. of Florida research team found that a rotation between spinosad and the entomopathogenic fungi *Metarhizium brunneum* (Met52) and *Beauveria bassiana* (BotaniGard 22WP), or insect growth regulator (azadirachtin, Molt-X), and horticultural oils (such as the ultra-fine oil or SuffOil-X) reduced chilli thrips populations by 88% to 95%. These products are considered "soft" on beneficial arthropods and are available to commercial landscape professionals. For home gardeners, insecticides containing spinosad, such as Conserve, can be rotated with ultra-fine oil or soapy water to treat infested plants during thrips active months (Aristizábal et al., 2016).

For nursery growers, insecticides containing abamectin (Avid), acephate (Orthene), chlorfenapyr (Pylon, greenhouse only), flonicamid (Aria), imidacloprid (i.e., Marathon), spinetoram (XXpire), spiromesifen (JUDO) and spinosad (Conserve) can help control chilli thrips in production nurseries. Rotation among different classes and modes of actions is recommended to reduce the risks of developing insecticide resistance and the outbreaks of secondary pests.

IPM OPTIONS FOR MANAGING CRAPEMYRTLE BARK SCALE

Based on several years of field and greenhouse testing, we have found that crapemyrtle bark scale can be controlled with the right insecticides and application methods. The scale is especially well-controlled using soil applied insecticides called neonicotinoids. However, the research team on CMBS has most recently found out that concentrations of two neonicotinoids, imidacloprid and dinotefuran in pollen collected from crapemyrtle trees treated in previous fall, winter and early spring are alarmingly high. While data is still being summarized for publication, we are strongly recommending you consider other management options before applying neonicotinoids because of the possibility that it can be detrimental to pollinators that collect and bring pollen back to their hives.

Our current recommendations include: Avoiding buying infested plants – inspect nursery stocks carefully for signs of CMBS before the purchase. Avoid plants with sticky leaves; black, sooty trunks; or white scale insects (that bleed pink when crushed) on stems and trunk.

The most susceptible life stage of CMBS to low-impact chemicals is the crawler stage, when the first instars are mobile and not covered by the protective wax. Crawler population monitoring by removable

double-sided sticky tapes over years have indicated that late April and early May is the time period that crawlers are coming out as their first peak presence in southeastern Louisiana. If this population is detected, horticultural oil or insect growth regulators (IGR) such as pyriproxyfen and buprofezin as foliar sprays can provide 50% to 100% control crawlers.

If trees are heavily infested, pressure-wash the trunk and reachable limbs with water can help remove the sooty mold and many female scales and egg masses, then using a soft brush and mild solution of dishwashing soap can provide some control to the rest. Washing will make other contact type chemicals more efficient.

Some lady beetle species, especially the twice-stabbed lady beetle, are important predators of crapemyrtle bark scale but cannot eradicate the scales or control heavy infestations. Certain insecticides such as carbaryl (i.e., Sevin) and many of the pyrethroid insecticides are harmful to lady beetles and may worsen the scale problems. Research on identifying parasitic wasps for biological control options is on-going and shedding light on biological solutions in the future.

Systemic insecticides in the neonicotinoid class have provided good control of CMBS in most cases. These products are more effective when applied to the root zone as a soil injection or drench, than as a spray applied to the foliage. Good control can be achieved with applications of clothianidin, dinotefuran (Safari), imidacloprid (Merit or Bayer Advanced Garden Tree and Shrub Insect Control), or thiomethoxam (Meridian). When using this class of insecticides, be sure to read all label directions carefully. Most neonicotinoid insecticides prohibit use when plants are in bloom to minimize risks to bees.

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