

Spread and management of *Eriococcus lagerstroemiae* Kuwana

(Hemiptera: Eriococcidae) on crape myrtle

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Introduction

- *Eriococcus lagerstroemia* Kuwana is an invasive scale pest with its first record for North America in Richardson, TX (Dallas Co.) in the summer of 2004.
- *Eriococcus lagerstroemia* Kuwana was designated the common name **crapemyrtle bark scale (CMBS)**, named after its current host, crape myrtles, which are an economically important and common landscape crop in many regions of southern and coastal States.
- High infestation of CMBS can lead to excessive sticky residue (honeydew) below the canopy of the crape myrtle, sooty mold production, reduce aesthetics, and is thought to reduce plant growth, reduced flowering, and overall plant health.
- Documenting their spread to new regions, studying their population dynamics within a season, and investigating potential effective insecticides will be vital to controlling the spread and impact of CMBS.

Geographic Distribution

- CMBS was first observed in Dallas County in 2004 (**Fig. 2**). Human-assisted spread, via the nursery industry, is the most likely mechanism for long-distance transport. Since the first sighting in 2004, CMBS has traveled over 1,187 miles (as the crow flies) from its original site of infestation in the USA (**Fig. 2**).
- Sightings can be reported to: eddmaps.org/cmbs/

Population Dynamics

Methods

- CMBS crawler populations were assessed across three States (TX, LA, AR) and seven locations (**Figure 3**) using double-sided ¾-inch wide sticky tape (Scotch, typically replaced weekly) wrapped around 3 - 6 branches per tree, with a total of 2 - 12 trees (replicates) per site.

- Tape length was measured and crawlers counted under a dissecting microscope to approximate # of scales/sq. in.
- In College Station, a total of 12 trees had 3 tapes placed on high and 3 tapes placed on low branches on each tree (total of 6 tapes per tree) to determine whether there is a difference in crawler activity at different heights of the tree throughout a season.

Results

- All Texas sites had small initial populations at 80 ± 10 days and first peak at 128 ± 13 days (**Fig. 3**).
- Littlerock, AR had the earliest and highest CMBS crawler populations, with a peak at 80 days (**Fig. 3**).
- All sites demonstrated distinct troughs and peaks.
- Traps in upper and lower branches had a similar pattern of CMBS populations throughout the season, but differed at two time points in amplitude (**Fig. 4**).

Management of CMBS

Methods

- Eleven highly infested crape myrtle plants were identified at LeTourneau University (Longview, TX) in the summer of 2014 for a CMBS management trial.
- CMBS counts were acquired by pruning five branches (30 cm in length) from each tree and analyzing under a dissecting microscope.
- After initial counts, trees were either untreated (n=3), treated with SuffOil-X + Molt-X (n=3), Ferti-lome tree and shrub insecticide (n=3), or Bayer advanced tree & shrub protect & feed (n=2), and CMBS counted weekly for 4 weeks after treatment (**Fig. 5**).

Results

- There was a significant decrease in the number of scales over time.
- There was no significant difference between treatments.
- Treatments were applied June 20th, 2014, which coincides with a natural decrease in CMBS populations in 2015 (Day 127 Julian Calendar).
- Declines in CMBS populations could have been explained by increase in natural enemy populations (non-quantified observation) or discrete generations
- Treatment applications should be applied during initial incline in CMBS populations to prevent subsequent peaks of CMBS populations within a season.

- Biological control agents may have potential in an augmentative early-release biological control program (**Fig. 6**)

Summary

- The crapemyrtle bark scale has traveled over 1,187 miles since its first introduction into the USA in 2004, with new reports annually.
- CMBS have a relatively narrow period of initial population peak in Texas (128 ± 13 days in 2015), lending to population prediction models (i.e. degree-day) and effective timing for pest management. Such trends have yet to be investigated in other States.
- Demonstrating reliable control of CMBS can be challenging in the face of natural peaks and troughs in CMBS populations during a season
- Augmentation of naturally occurring predators may be effective against CMBS.

Acknowledgement

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Figure 1. High crapemyrtle bark scale (CMBS) infestation as seen on upper branches of a crape myrtle tree (A), close-up with the naked eye (B), and under a microscope (C). White spots on the trees represent pupating males (ovular) or female egg sacs (round). Nymphs are hard to see with the naked eye and are most easily seen under a microscope (C). Photo Credits: Erfan Vafaie.



Figure 2. Current distribution of CMBS across the USA since its first sighting in 2004. States with reports of CMBS now include TX, OK, LA, AR, NM, TN, GA, AL, and VA.

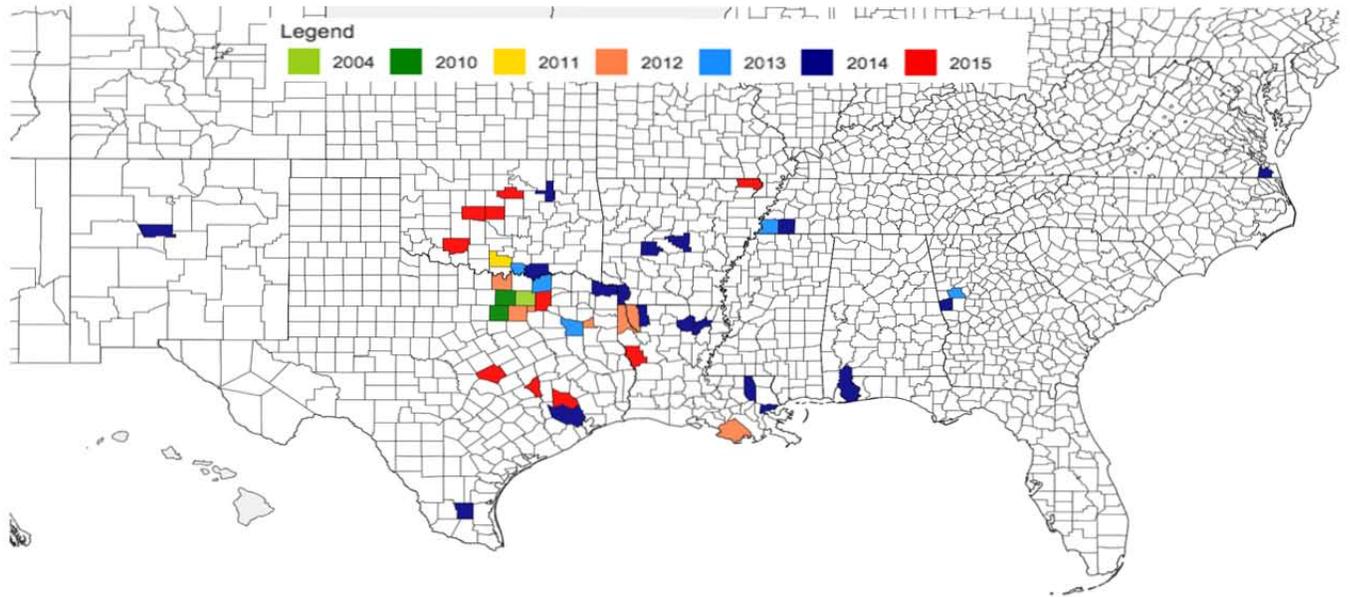


Figure 3. Mean CMBS crawlers per square inch (\pm SE) caught in double-sided sticky tape traps wrapped around tree branches in different locations. Each tree had three-to-six pieces of double-sided sticky tape and replicated on two-to-twelve trees per site. Double-sided sticky tape was typically replaced weekly and crawlers were counted under a dissecting microscope. Vertical dashed lines represent first distinguishable peak in populations.

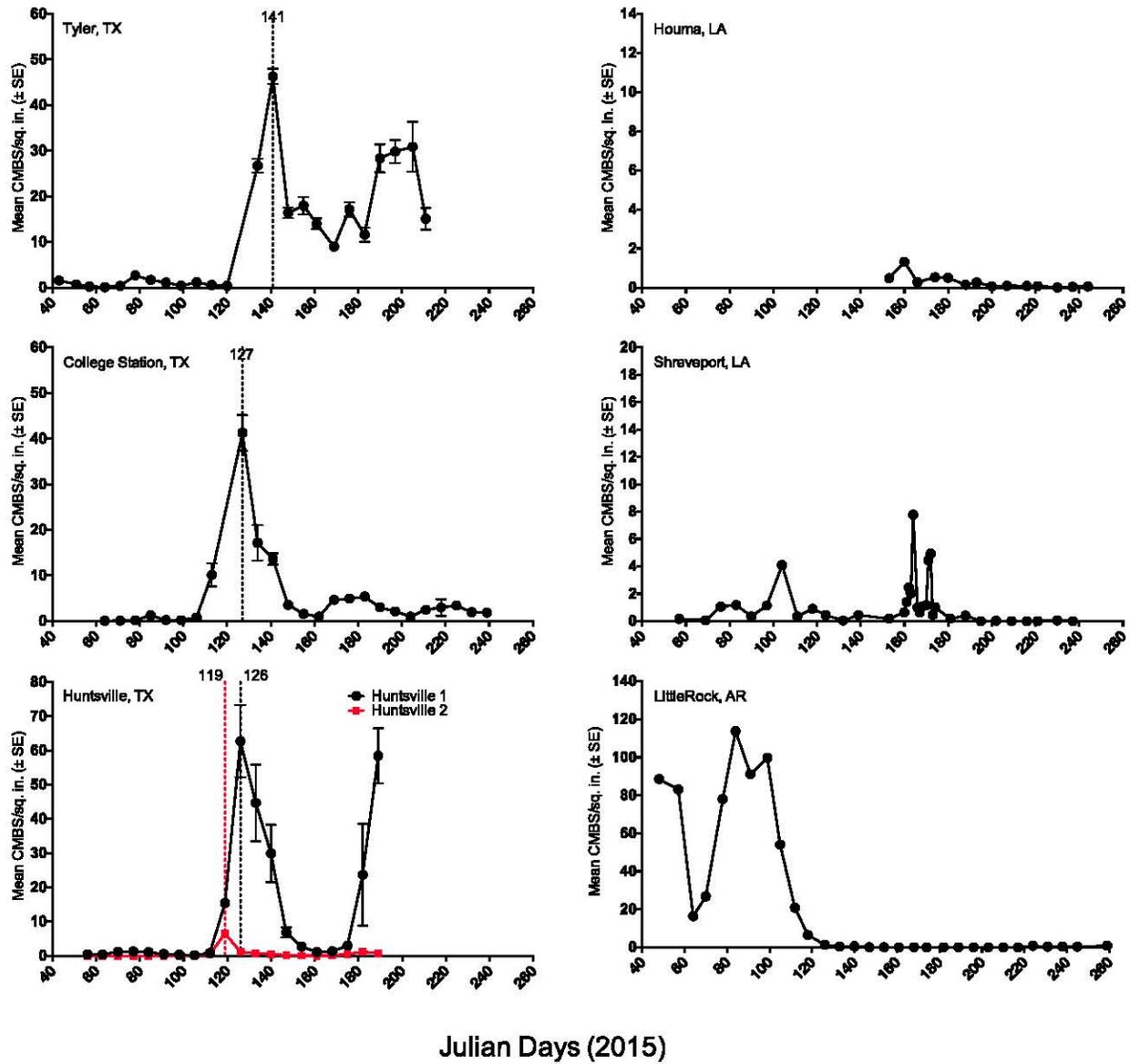


Figure 4. Mean CMBS crawlers per square inch (\pm SE) caught in double-sided sticky tape traps wrapped around upper (black) and lower (red) tree branches in College Station, TX (n=12).

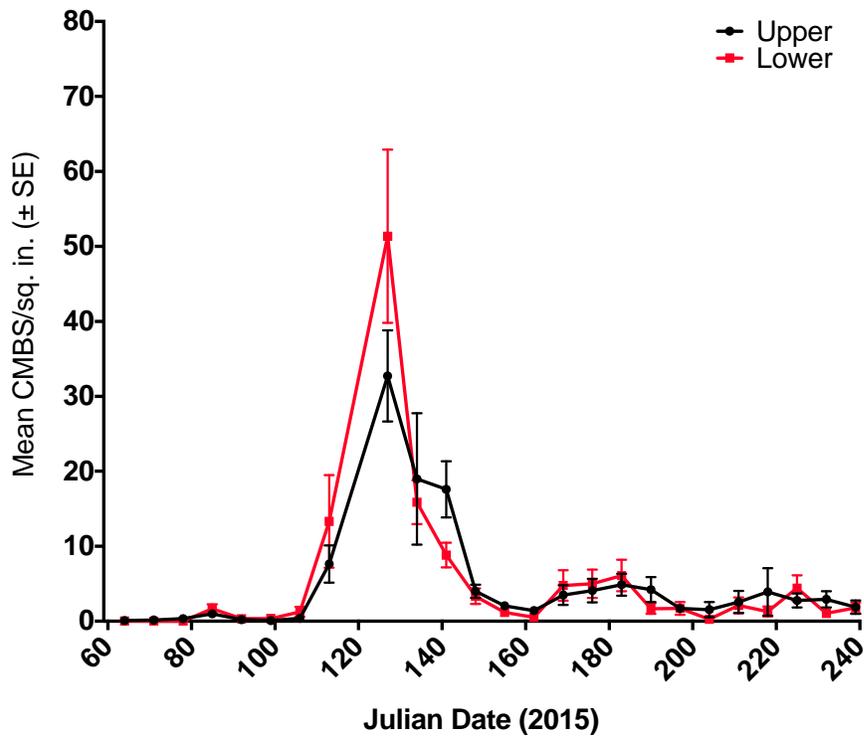


Figure 5. Mean alive CMBS on 30 cm of branch for six weeks. Trees were either untreated (n=3) or treated with SuffOil-X + Molt-X (n=3), Ferti-lome tree and shrub insecticide (n=3), or Bayer advanced tree & shrub protect & feed (n=2).

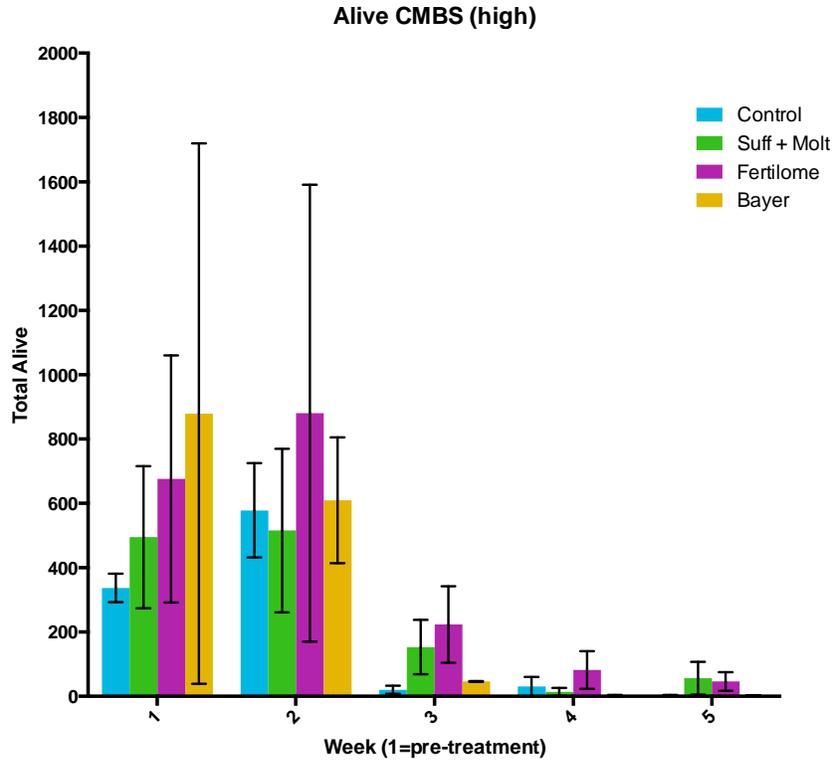


Figure 6. Main ladybird beetles seen eating CMBS. *Hyperaspis lateralis* Mulsant (A), *Chilocorus cacti* L. (B), *Scymnus* sp. or *Hyperaspis* sp. (C), and an image of several ladybird beetle pupating near a high infestation of CMBS. The abundance of ladybird beetles on trees with CMBS suggests that they may be responsible for reductions in CMBS populations and may have potential for biological control. Photo Credits: Dr. Mike Merchant (A & B), Erfan Vafaie (C & D).

