

# Crapemyrtle Bark Scale

*Acanthococcus (=Eriococcus) lagerstroemiae*



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The crapemyrtle bark scale (*Acanthococcus (=Eriococcus) lagerstroemiae*) is in the family Eriococcidae (or Acanthococcidae, as the taxonomy of this family is still being debated). This group is in the superfamily *Coccoidea* (scale insects) and the order Hemiptera (true bugs).

The primary host in North America, crapemyrtle, *Lagerstroemia* spp., are deciduous flowering trees popular in ornamental landscapes. They are top-sellers in the nursery trade, with the annual wholesale value estimated to be \$66 million in 2014. Based on urban tree inventories of several major cities in the southeastern U.S., crapemyrtle are among the most common landscape trees planted in this region.

## Resources

- Cai, X., H. Dou, M. Gu, M. Merchant, and E. Vafaie. 2015. Update on crapemyrtle bark scale. Proceedings of the 2015 Annual Meeting of the International Plant Propagators' Society. 1140: 415–418.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. Insects. 7: 33–34.

# Crapemyrtle Bark Scale

- In the group of insects known as felt scales
- Native to Asia
- First report in the US
  - 2004 in Richardson, Texas (Dallas County)
- Formerly known as *Eriococcus lagerstroemiae* Kuwana

Close-up of a crapemyrtle bark scale infestation, showing the fuzzy, felt-like covering of the adult female scales



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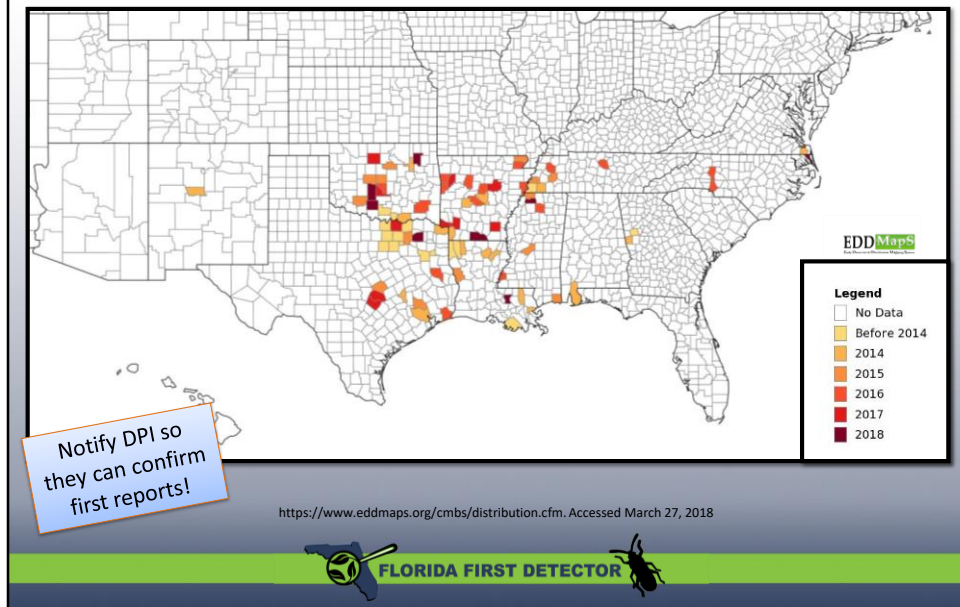
The crapemyrtle bark scale (abbreviated as CMBS) belongs to a group of scale insects known as felt scales or bark scales. Felt scales are not considered armored scales or soft scales. In 2004, the scale was first observed feeding on crapemyrtle in Richardson, Texas, a Dallas suburb. Scientists were unsure if a nearly identical species, the azalea bark scale, had begun attacking a new host plant or if this was a newly introduced species.

By 2014, DNA and morphological tests helped scientists identify this species as *Acanthococcus* (= *Eriococcus*) *lagerstroemiae*, a felt scale from Asia that was known to feed on crapemyrtle species. The scale insect is widely distributed in Asia, especially China, which is thought to be its native range. It is also found in Japan, Korea, and India.

## Resources

- Cai, X., H. Dou, M. Gu, M. Merchant, and E. Vafaie. 2015. Update on crapemyrtle bark scale. Proceedings of the 2015 Annual Meeting of the International Plant Propagators' Society. 1140: 415–418.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crapemyrtle Bark Scale: A New Insect Pest, FSA7086. University of Arkansas Cooperative Extension Service.

## U.S. Distribution as of March 2018



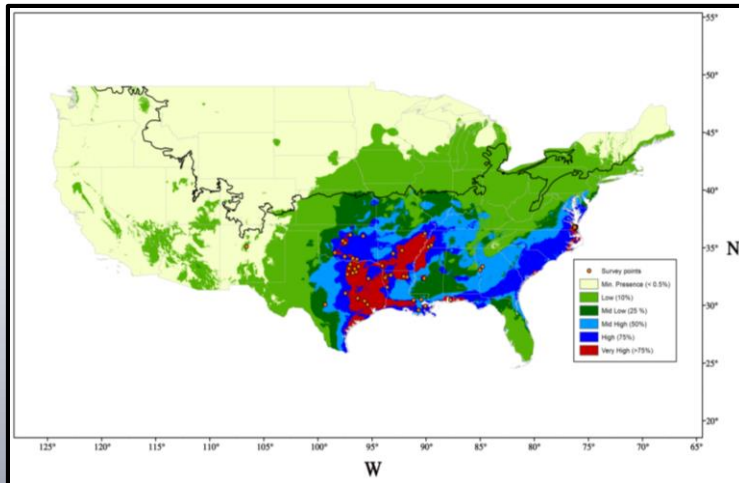
As of spring 2018, crapemyrtle bark scale was reported in Alabama, Arkansas, Georgia, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, Tennessee, Texas, Virginia, and Washington. Most new infestations have been found in Texas, Oklahoma, and Arkansas.

Have you seen crapemyrtle bark scale in an area not yet reported? Specimens must first be confirmed by Florida's Department of Plant Industry so that they can publish a first report and take any necessary regulatory actions. DPI Sample Submission: <https://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Business-Services/Submit-a-Sample-for-Identification>. Local county agents and Dr. Gary Knox should be notified, and confirmed sightings can also be reported here: <https://www.eddmaps.org/cmbs/>.

### Resources

- EDDMapS developed by The University of Georgia - Center for Invasive Species and Ecosystem Health, as part of the Southern IPM Center with funding provided by USDA NIFA.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. *Insects*. 7: 33–34.

## Projected distribution in the U.S



Wang *et al.*, 2016. Figure 3. Projected distribution of *Acanthococcus lagerstroemiae* in the U.S. Warmer color indicates the higher climatic suitability. Orange points indicate the location of reported infestation. The black line indicates the upper limit of Plant Hardiness Zone 6. (CC BY 4.0)



Based on regional climates in the U.S., scientists have generated predictions of where this insect may spread. Using this information, North Florida is at a moderate to high risk of becoming infested. Imports of crapemyrtle to these areas should be inspected carefully.

Observations of rampant CMBS infestations in Shanghai, China, further suggest that USDA Zone 9 provides suitable temperatures.

### Resources

- Knox, Gary. Personal communication, January 2018.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. *Insects*. 7: 33–34.

## Susceptible Hosts

So far in the U.S., only found on crapemyrtles, (*Lagerstroemia* spp.) and reported on American beautyberry (*Callicarpa americana*)



Crapemyrtle (*Lagerstroemia indica*), Richard Webb, Bugwood.org, #1480596  
American beautyberry, Chris Evans, University of Illinois, Bugwood.org, #UGA2118052

Another economically important reported host: pomegranate (*Punica granatum*)



Karan A. Rawlins, University of Georgia, Bugwood.org, #5428527



In the United States, crapemyrtle bark scale has only been found feeding on crapemyrtles, (Myrtales: Lythraceae: *Lagerstroemia* spp.) and also on American beautyberry (Lamiales: Verbenaceae: *Callicarpa americana* L.). *Lagerstroemia* species are native to the same region in Asia as crapemyrtle bark scale and is a preferred host. *Callicarpa americana*, however, is native to the United States. This new host record is concerning, because American beautyberry is widely distributed in natural areas, roadsides, and urban sites in the Southeast. However, it is not yet clear what role this plant may play in the spread of crapemyrtle bark scale.

While crapemyrtle bark scale has not yet been found on other hosts in North America, it has been reported feeding on a number of other species in Asia and Hungary. A few of these are economically or ecologically important and include pomegranate (*Punica granatum*), Korean boxwood (*Buxus microphylla*), Chinese hackberry (*Celtis sinensis*), Japanese persimmon (*Diospyros kaki*), border privet (*Ligustrum obtusifolium*) and brambles (*Rubus* sp.). Continued observation of crapemyrtle bark scale will help us determine if it is a threat to other species in North America. Dr. Mengmeng Gu at Texas A&M is currently conducting research on additional U.S. host plants.

### Resources

- For a complete lists of hosts reported, see:

<http://scalenet.info/catalogue/Acanthococcus%20lagerstroemiae/>.

- Knox, G., M. Gu, M. Merchant, E. Vafaie, Y. Chen and J. Robbins. 2018. Biology and potential impacts of the emerging pest, crapemyrtle bark scale. Proc. SNA Res. Conf. 62: In press.

- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. Insects. 7: 33–34.

## Identification

- Easy! The first and only bark scale known to feed on crapemyrtle in the U.S.
- Look for white or gray felt-like scales on trunks, branches, and twigs. Heavily infestations conspicuous.

Nymphs, also called crawlers



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Adult females and opened egg sacs



Helene Doughty, Virginia Polytechnic Institute and State University, Bugwood.org, #5552233



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Identification of crapemyrtle bark scale is relatively simple because this is the first and only bark scale known to feed on crapemyrtle in the United States. Heavy infestations are easily seen due to abundant black sooty mold and patches of the white or gray scales on trunk, branches, and twigs.

On old growth, the scales may be grouped around pruning wounds or branch crotches, while distribution should be more uniform on new growth where the small, pink crawlers have recently spread and established. More mature scales are white to gray and up to 2 mm in length. A mass of pink eggs may be seen if the white covering is pulled away.

### Resources

- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crapemyrtle Bark Scale: A New Insect Pest, FSA7086. University of Arkansas Cooperative Extension Service.

# Identification

- Light or recent infestations:  
Carefully examine new growth and small twigs.
- Sooty mold can indicate scale, other pests, or both.
  - Often from crapemyrtle aphids
- Crapemyrtle bark scale “bleeds” pink when injured.
  - This fingernail scraping confirmed live, overwintering crapemyrtle bark scale.



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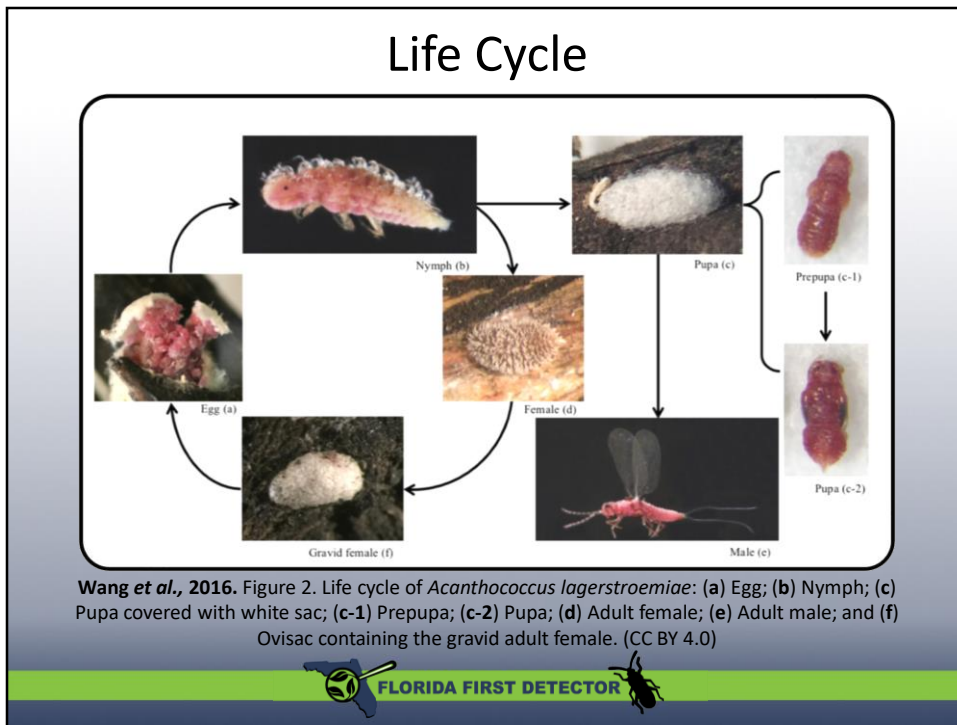


When scouting large trees, it is important to look not just at the trunk and lower branches. Most of the scales are likely to be on the upper branches and small twigs. For small plants, inspect all woody parts before purchasing or placing in the landscape. Any crapemyrtle covered in sooty mold should be inspected to see if the cause is bark scale or another insect that also produces honeydew and sooty mold, such as crapemyrtle aphid (*Tinocallis kahawaluokalani*). These aphids feed on the leaves and tender new stems but not woody parts of the plant, while crapemyrtle bark scales are very rarely seen on the leaves.

Encrustations of scale insects remain on a plant long after the insect has died, so it can be helpful to scrape some scales to determine if they are still living. Dead scales are dry and flakey, while live crapemyrtle bark scales bleed a ruby pink color. Any sharp point can be used to break open the white felt-like covering to see if a female scape bleeds pink or has clusters of pink eggs present.

## Resources

- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crapemyrtle Bark Scale: A New Insect Pest, FSA7086. University of Arkansas Cooperative Extension Service.



The adult female secretes a white, felt-like sac around her body and lays approximately 100-300 pink eggs within it. The nymphs, or crawlers, are also pink and develop through three stages, turning a darker pink, grey, or brown color as they mature. During the first stage they are mobile and can spread to new woody growth of the plant. After the first molt, nymphs lose their legs and become sessile, settling in-place to feed and grow.

Some nymphs continue through incomplete metamorphosis (do not pupate) to become immobile adult females. Other nymphs form a white, felt-like sac and develop into prepupa and then to pupa further inside, eventually pupating to emerge as tiny, winged adult males (alates). The males are pink, with two long white filaments at the tip of the abdomen, and have no mouthparts. They actively search for adult females. Only the nymphs and adult females feed and secrete honeydew, which causes sooty mold growth. The caption on the next photo labels the males as alates, but there isn't anything before that explaining that it's the winged male. If you add (alate) here then that should reduce confusion on the caption so you don't have to explain there.

In the Southeast U.S., there seems to be 2-4 overlapping generation cycles per year. Any stage of the scale can overwinter, especially the nymphs which can be found nearly year-round. Activity resumes early in the spring, and the number of crawlers seems to peak around the beginning of summer. Populations in Arkansas have also been observed to peak again in late July/August with the third generation. It is unknown how the scale life cycle might adapt in Florida, and more research on the life cycle is in progress to see if there is a predictable pattern.

### Resources

- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crapemyrtle Bark Scale: A New Insect Pest,



FSA7086. University of Arkansas Cooperative Extension Service.

- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. *Insects*. 7: 33–34.

# Life Cycle



Photograph showing numerous crapemyrtle bark scale nymphs, male pupae, and one winged adult male.

Image: Erfan Vafaie, Texas A&M AgriLife Extension



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Photograph showing numerous crapemyrtle bark scale nymphs, male pupae, and one winged adult male. Image: Erfan Vafaie, Texas A&M AgriLife Extension

# Damage

- Black sooty mold, eyesore, reduced flowering, possible branch dieback and stunting

Sooty mold may cover the bark, leaves, and other plants or surfaces below an infestation

A heavy infestation of crapemyrtle bark scale has decreased the panicle (flower cluster) size in the lower row, and likely shorted the flowering period.



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The primary damage from crapemyrtle bark scale is aesthetic rather than being severely harmful to the tree. Nymphs produce copious amounts of honeydew, a sugary, sticky excrement, which accumulates on any surfaces beneath where the insects feed. Black sooty mold fungi then grow on the honeydew and can result in blackened shrubs, lawn, mulch, concrete, and the crapemyrtle tree itself. Branch dieback and stunted growth has been occasionally observed, but is probably not a primary concern. Leaves coated in sooty mold photosynthesize less, which may translate to reduced tree growth.

Crapemyrtle is considered a low-maintenance tree and is enormously popular, especially in the urban landscape. Infested trees may force the owner or landscape manager to choose between having an eyesore in their landscape, paying for relatively costly annual scale treatments, or replacing the tree altogether. Because crapemyrtle is one of the only summer-blooming trees in the landscape, reduction in flower quality and longevity due to heavy infestations is also concerning.

## Resources

- Cai, X., H. Dou, M. Gu, M. Merchant, and E. Vafaie. 2015. Update on crapemyrtle bark scale. Proceedings of the 2015 Annual Meeting of the International Plant Propagators' Society. 1140: 415–418.
- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. Insects. 7: 33–34.

# Prevention of Spread

- New, long-distance infestations likely occur through human movement of plant material (nursery and landscape trade)
- Carefully inspect new crapemyrtles before purchasing and planting
- Buy from reputable nurseries



Image: An “easy entry” via an injury or pruning wound, where crapemyrtle bark scale infestations seem to start.

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Human-assisted, long distance movement of plant material via the nursery and landscape trades is most likely how this species becomes established in new regions. This may occur when purchasing and moving new plants, or when hauling infested branches away from a site for disposal. Based on observations from Dallas, Texas, an established infestation may be able to spread locally at approximately 5-10 miles per year. Local dispersal is likely a combination of the tiny nymphs walking, by wind blowing crawlers to new plants, by human activities, and by bird and mammal movement between trees.

Always inspect crapemyrtles carefully before purchasing or planting, especially if they originated from parts of the Southeast where crapemyrtle bark scale is already established. Look for injuries or pruning wounds on the trunk and branches, as scale infestations often start at these sites. Buy from reputable nurseries who are knowledgeable about crapemyrtle bark scale and inspect outgoing plants.

If an infested plant is found in a new area, it may be appropriate to destroy the plant rather than attempt treatment. If the plant is to be removed and transported for any reason, including destruction, it should be carefully bagged to avoid scales being blown off the plant and into new landscapes during transportation.

## Resources

- Gu, M., M. Merchant, J. Robbins, and J. Hopkins. 2014. Crape myrtle bark scale: A new exotic pest, EHT-049. The Texas A&M University System, Texas A&M AgriLife Extension Service.
- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Merchant, M. E., A. Texas, M. Gu, A. Texas, J. Robbins, E. Vafaie, A. Texas, N. Barr, U. Aphis, A. D. Tripodi, and A. L. Szalanski. 2014. Discovery and spread of *Eriococcus lagerstroemiae* Kuwana (Hemiptera: Eriococcidae), a new invasive pest of crape myrtle, *Lagerstroemia* spp.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. *Insects*. 7: 33–34.

# Biological and Cultural Control

- Encourage natural enemies
- Monitor for ant activity
- Plant selection:
  - High infestations have been observed on some cultivars, but more research is needed.
  - No cultivars are known to be highly resistant.

Image: One adult, several pre-pupae, and many pupae of twice-stabbed lady beetle after feeding on a CMBS infestation.



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Natural enemies: Several predators (and possibly parasitoids, research is ongoing) serve as biological control for crapemyrtle bark scale in the Southeast. The most effective of these seem to be twice-stabbed lady beetles, such as *Chilocorus stigma* and *Chilocorus cacti*. However, despite the predation by these and other lady beetle species, their control often comes too late in the season to prevent damage from the scales and sooty mold. If new populations of crapemyrtle bark scale were discovered in Florida, they should be eradicated quickly. If left to wait for biological control, the infestation may be allowed time to spread further.

Monitor for ants moving up and down crapemyrtle trees. Ants have been observed on many trees with crapemyrtle bark scale infestations, but it is not known how they interact. Some ant species feed on the sugary honeydew produced by scale insects, and ants sometimes play a role in starting new infestations by moving scales to other plants and by reducing biological control by protecting scale insects from predators. If ants are observed moving up and down crapemyrtle trees it may be helpful to identify any insects they are visiting.

In the future, plant selection may play an important role in management. So far, no cultivars of crapemyrtle are known to have high levels of resistance to the scale. Some cultivars, however, have been observed with high infestations, including 'Tuscarora', 'Lipan', 'Pink Ruffles', 'Tuskegee', 'Acoma', 'Velma', 'Choctaw' and 'New Orleans'. More research is needed before cultivar selection can be incorporated into management plans.

## Resources

- Cai, X., H. Dou, M. Gu, M. Merchant, and E. Vafaie. 2015. Update on crapemyrtle bark scale. Proceedings of the 2015 Annual Meeting of the International Plant Propagators' Society. 1140: 415–418.
- Gu, M., M. Merchant, J. Robbins, and J. Hopkins. 2014. Crape myrtle bark scale: A new exotic pest, EHT-049. The Texas A&M University System, Texas A&M AgriLife Extension Service.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. *Insects*. 7: 33–34.

# Chemical Management

- Systemic insecticide drenches or soil injections offer the most effective, long-term control
- Also treat any surrounding, uninfested crapemyrtles to prevent local spread
- Carbaryl, acephate, and cypermethrin can cause scale populations to increase

Application of systemic insecticides to the root zone of a crapemyrtle



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Because crapemyrtle bark scale is not yet found in Florida, any discovered populations should be eradicated as soon as possible. Plant removal and chemical control are the most effective ways to do this. Best results have been achieved with the use of systemic insecticides applied as a drench or soil injection to the root zone in early summer, or just before peak crawler activity. These include imidacloprid, dinotefuran, clothianidin, and thiomethoxam. The disadvantage of these products is that they take several weeks to move throughout the plant. If immediate control is needed, some contact insecticides can significantly reduce the number of crawlers, but the effect is relatively short-lived. These include bifenthrin, applied as a bark-spray two times with a 17-day interval. Contact insecticide options on the next page may also be helpful. For more detailed control information and key considerations, see **Layton, B. 2015**, and **Chen, et al., 2017** below.

**If you plan to use insecticides, be sure to check with your local county extension agent regarding any restrictions on use of these pesticides as some may require an applicator's license!** The current chemical recommendations can be extremely toxic to bees and other pollinators that feed on crapemyrtle pollen. Applications should not be made if the tree is in flower, and all pollinator protection requirements on the label must be followed to minimize risk.

Be careful not to make an infestation worse by applying pesticides that have not been recommended by authorities. Studies show that carbaryl (as Sevin), acephate (as Orthene) and cypermethrin (a pyrethroid) caused increases in scale populations, likely because these pesticides are not very effective against the scale insect, but are highly toxic to lady beetle predators.

## Resources

- Chen, Y., M. Merchant, E. Vafaie, M. Gu, and J. Robbins. Oct 2017. Crape myrtle bark scale management updates. Louisiana State University Ag Center.
- Gu, M., M. Merchant, J. Robbins, and J. Hopkins. 2014. Crape myrtle bark scale: A new exotic pest, EHT-049. The Texas A&M University System, Texas A&M AgriLife Extension Service.
- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crapemyrtle Bark Scale: A New Insect Pest, FSA7086. University of Arkansas Cooperative Extension Service.
- Vafaie, E. K., and C. M. Knight. 2017. Bark and Systemic Insecticidal Control of *Acanthococcus* (=Eriococcus) *lagerstroemiae* (Crapemyrtle Bark Scale) on Landscape Crapemyrtles, 2016. Arthropod Management Tests. 42: 1–2.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crapemyrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. Insects. 7: 33–34.

# Chemical Management

- Additional contact insecticide options: Pyriproxyfen, tank mix of horticultural oil + azadirachtin
- Requires multiple applications and careful timing with peak scale crawler emergence
- Scrubbing branches with soap solution and a soft brush may help reduce females and egg masses.

Ladybeetle pupae on previously infested branch

Erfan Vafaie, Texas A&M AgriLife Extension



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Integrated pest management (IPM) plans to control CMBS are still being developed, but may incorporate the use of certain reduced-risk insecticides that have been successfully useful against other scales, resistant crapemyrtle cultivars, and biological control. Recent efficacy trials show that pyriproxyfen (an insect growth regulator) and tank mixes of horticultural oil + azadirachtin (a pesticide derived from the neem plant) provided good control when applied 3 times (10-14 day interval) during the period of peak crawler emergence in late spring. However, when applied alone, azadirachtin, malathion and horticulture oil could only partially suppressed crapemyrtle bark scale and thus are not recommended.

Prior to treatment of heavily infested plants, it can be helpful to wash the reachable branches with a mild soap solution and a soft scrubbing brush. While this alone will not control an infestation, it can remove many female scales and egg masses, making the chemical treatment more effective. Note that these methods of control should only be used if crapemyrtle bark scale is established in an area, since poor control may result in further spread of the pest.

## Resources

- Chen, Y., M. Merchant, E. Vafaie, M. Gu, and J. Robbins. Oct 2017. Crape myrtle bark scale management updates. Louisiana State University Ag Center.
- Gu, M., M. Merchant, J. Robbins, and J. Hopkins. 2014. Crape myrtle bark scale: A new exotic pest, EHT-049. The Texas A&M University System, Texas A&M AgriLife Extension Service.
- Layton, B. 2015. Crape Myrtle Bark Scale Identification and Control, Publication 2938. Mississippi State University Extension.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crape myrtle Bark Scale: A New Insect Pest, FSA7086. University of Arkansas Cooperative Extension Service.
- Vafaie, E. K., and C. M. Knight. 2017. Bark and Systemic Insecticidal Control of *Acanthococcus* (= *Eriococcus*) *lagerstroemiae* (Crapemyrtle Bark Scale) on Landscape Crapemyrtles, 2016. Arthropod Management Tests. 42: 1–2.
- Wang, Z., Y. Chen, M. Gu, E. Vafaie, M. Merchant, and R. Diaz. 2016. Crape myrtle bark scale: A new threat for crapemyrtles, a popular landscape plant in the U.S. Insects. 7: 33–34.

## Look-alike Species

Azalea bark scale  
*Acanthococcus* (= *Eriococcus*) *azalea* (Comstock)



United States National Collection of Scale Insects Photographs,  
USDA Agricultural Research Service, Bugwood.org, #UGA5119027



J.A. Davidson, Univ. Md, College Pk, Bugwood.org, #1635348



The azalea bark scale is in the same genus (*Acanthococcus*) as crapemyrtle bark scale and appears virtually identical. However, this scale has a different host range that is not known to overlap with that of crapemyrtle bark scale. For example, it does not feed on crapemyrtle and is primarily a pest on azaleas (*Rhododendron* species). It is widely distributed through most of North America.

### Resources

- For detailed information on host range of this scale, see <http://scalenet.info/catalogue/Acanthococcus%20azaleae/>.
- Robbins, J., J. Hopkins, M. Merchant, and M. Gu. 2014. Crapemyrtle Bark Scale: A New Insect Pest, FSA7086. University of Arkansas Cooperative Extension Service.
- Merchant, M. E., A. Texas, M. Gu, A. Texas, J. Robbins, E. Vafaie, A. Texas, N. Barr, U. Aphis, A. D. Tripodi, and A. L. Szalanski. 2014. Discovery and spread of *Eriococcus lagerstroemiae* Kuwana (Hemiptera: Eriococcidae), a new invasive pest of crape myrtle, *Lagerstroemia* spp.



# References

1. Cai, X., H. Dou, M. Gu, M. Merchant, and E. Vafaie. 2015. Update on crapmyrtle bark scale. Proceedings of the 2015 Annual Meeting of the International Plant Propagators' Society. 1140: 415–418.
2. Chen, Y., M. Merchant, E. Vafaie, M. Gu, and J. Robbins. Oct 2017. Crape myrtle bark scale management updates. Louisiana State University Ag Center.  
– <http://www.lsuagcenter.com/articles/page1508343389870>
3. García Morales M, Denno BD, Miller DR, Miller GL, Ben-Dov Y, Hardy NB. 2016. ScaleNet: A literature-based model of scale insect biology and systematics. Database. doi: 10.1093/database/bav118. <http://scalenet.info>. *Acanthococcus lagerstroemiae* (Kuwana) 1907. (5 May 2018)
4. Gu, M., M. Merchant, J. Robbins, and J. Hopkins. 2014. Crape myrtle bark scale: A new exotic pest, EHT-049. The Texas A&M University System, Texas A&M AgriLife Extension Service.  
– <https://aglifesciences.tamu.edu/entomology/wp-content/uploads/sites/12/2014/04/Gu-and-Merchant-2014-Crape-mrytle-bark-scale-EHT-049.pdf>
5. Knox, G., M. Gu, M. Merchant, E. Vafaie, Y. Chen and J. Robbins. 2018. Biology and potential impacts of the emerging pest, crapemyrtle bark scale. Proc. SNA Res. Conf. 62: In press.
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– <https://extension.msstate.edu/sites/default/files/publications/publications/p2938.pdf>



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### Additional Resources

Crapemyrtle Bark Scale Resource Website: <http://stopcmbs.com/>  
 Early Detection and Distribution Mapping System (EDDMapS):  
<https://www.eddmaps.org/cmbs/>







Image at left: Male pupa. Erfan Vafaie, Texas A&M AgriLife Extension

Wondering who to contact in your state about crapemyrtle bark scale?

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Image at left: Male pupa. Erfan Vafaie, Texas A&M AgriLife Extension

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## Collaborating Agencies

- U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS)
- Cooperative Agricultural Pest Survey Program (CAPS)
- Florida Department of Agriculture and Consumer Services (FDACS)
- National Plant Diagnostic Network (NPDN)
- Sentinel Plant Network (SPN)
- Protect U.S.
- University of Florida Institute of Food and Agricultural Sciences (UF/IFAS)




Image at left: Male pupa. Erfan Vafaie, Texas A&M AgriLife Extension

**Florida First Detector** is a multiagency educational effort focused on enhancing the early detection of exotic, invasive pests that threaten agriculture, nursery industries, and natural areas. Our website provides scripted presentations for educators of Master Gardeners, small farm producers, nursery growers, public garden staff, and state park personnel. Our website also directly links interested members of the public and past workshop attendees to Florida-focused e-learning modules.

Our program is a cooperative effort between the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), and Plant Protection and Quarantine (PPQ), the University of Florida, Florida Department of Agriculture and Consumer Services (FDACS), the Cooperative Agricultural Pest Survey Program (CAPS), the National Plant Diagnostic Network (NPDN), Protect U.S. and the Sentinel Plant Network (SPN).

<http://flfirstdetector.org/>



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