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White Peach Scale & Japanese Maple Scale

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Note: The use of pyrethroid insecticides (Bifenthrin, Tempo, Talstar, OnyxPro, Tame, Mavrik, Astro, Perm-up, Permethrin, Ambush) will initially kill many of the scale but unfortunately the insecticide is very toxic to the natural predators and parasitoids of scale. Thus, there will be a resurgence of scale population so that you typically end up with more scale than you started with after a pyrethroid is used. We began using more pyrethroids when Dursban (chlorpyrifos) became a restricted use pesticide. Consequently, we began seeing more scale problems a few years later.

General comments about Scale and the Use of Horticultural Oil in General

Scale are important since shipments have been and will be rejected when scale are present. Scale are insects, though they are often thought to be something else such as fungi because no head, legs or even movement is observed.

Armored scale, such as **white peach scale (WPS)** and **Japanese maple scale (JMS)** have a protective waxy covering over their soft body that repels most contact insecticides and makes them difficult to control. Armored scale do not produce honeydew like soft scale. Thus, sooty mold is not associated with armored scale. A large population of scale can weaken a plant over time by sucking sap from the plant and rupturing plant cells.

Before spraying, learn how to determine if scale are dead or alive because dead scale may darken but remain on the plant. Rub the scale (the bark) with your fingers to learn how moist and sticky it is when alive. Dead scale will be dry and dusty after 7-10 days depending on the temperature.

During the dormant period, spray Horticultural oil when the temperature is above 40 degrees F and freezing will not occur before the spray can dry. Spray oils on bright, clear, sunny days that will provide good drying conditions. Insects generally do not build resistance to the oils. Light rain is of no concern.

Many overwintering insects and their eggs (mites, scale, pine bark adelgid, oak phylloxera and the spiny witch hazel leaf gall aphid on birch) are more vulnerable to Horticultural Oil in late winter.

White Peach and Japanese Maple Scale are the first scale that have declared war on our nursery trees and publicly declared they will take “No Prisoners!” It has surprised many nursery producers when an airblast sprayer has not achieved control. But an airblast does not achieve complete coverage of the trunks and branches. Those that attended the Sprayer Workshop in 2011 witnessed that.

Producers have gotten use to successfully controlling foliar insects and fungi by driving an airblast sprayer around blocks of 2 inch trees containing up to 11 rows. Units I have checked were applying around 35 gallons of spray solution per acre.

Making two trips around a block to double the spray volume per acre does not increase the coverage as you might think. Hanging water sensitive paper in the center of the block has shown that dry paper after the first application remained dry after the second trip around the block, while wet spots got wetter. Scale will not be killed unless the pesticide makes contact. Oil is effective where absolute total coverage is achieved. Begin planting host crops into 4 row blocks to improve spray coverage from existing airblast sprayers. Land is probably not limited.

WPS and JMS are not found on the foliage but instead occur on the bark. Many of these scale live in the rough bark around the branch crotches and under the layers of exfoliating bark. The JMS adult female measures less than 2mm long (25mm = 1 inch). Oils and insecticides work best if they are composed of tiny droplets that thoroughly cover each and every millimeter not only on the smooth surfaces but also in the crevices of branch collars, etc. Due to the waxy nature of the scale armor, most insecticides bounce off the armor like bullets bounce off Superman.

The Crawler Stage

Adult females lay their eggs under their bodies and their protective armor. The stage that hatches from eggs is called the first instar or crawler stage. There may be 25 crawlers or so under each female. Only the crawler stage lacks the waxy protective armor. The crawlers are thus the most susceptible to chemical control. The crawlers are the weakest link and thus the best opportunity for controlling infestations. As they mature, they develop the waxy body armor that protects them from the environment and also from contact insecticides.

Producers have not yet realized how difficult this pest will be to control, nor the degree of spray coverage required. Japanese beetles and fire ants are easy in comparison. Like the British Red Coats, Japanese beetle adults and the fire ant mounds occur right out in the open, but scale hide like guerrilla fighters.

Alternative spray equipment includes smaller airblast sprayers which can be driven down each middle and handgun sprayers. Both of these options can provide improved

spray coverage, especially in blocks with more than 4 rows. Growers should consider planting host crops in 4 row blocks so that current airblast sprayers can be more effective.

Each generation matures, lays its eggs and dies around the time that the eggs hatch. If you can either kill the adult in Feb-March or get good control of the crawlers, you can begin to break the life cycle and reduce populations. The control of scale must be proactive and less reactive.

In 2011, an 11 row block of red maple was inspected and found to be infested with JMS. The only bark that was clean was on the outside row of trees; the side of the tree facing the sprayer. The spray did not wrap around the tree or blow across 10 rows or kill the scale systemically. Driving the airblast around the block did not produce one clean tree that could be shipped. Thus, the larger airblast sprayers are not achieving adequate spray coverage in these larger blocks.

WPS & JMS look slightly different with close examination, have different life cycles, are controlled with the same insecticides and practices, but require different timing to kill the crawler. Bring bark or branch samples to an Extension office in order to determine which scale you have so you will know which months to monitor for crawlers.

White Peach Scale (WPS) had not been seen locally for 30 years when it was found on ash in 2003. It has since been found on peach, weeping mulberry, goldenraintree, red/yellow twig dogwood, maple, privet, birch, lilac, willow and pear.

The adult female has a distinctive “fried egg” appearance and clusters of males give the bark a fluffy appearance. This scale has 3 generations per year. The crawlers are usually present sometime in May, July and September.

Japanese Maple Scale (JMS) was first found in the US in 1914, now found in Washington DC, CT, DE, GA, MD, NJ, NY, PA, RI, VA, NC, LA, KY and TN. It has recently become an emerging pest problem in nurseries and the landscape.

Small populations are not easily detected because they are so small and blend in with the natural color variation of bark. It is oystershell-shaped. The waxy coating over the body is white. But the actual female body, eggs and crawlers under the white layer are lavender (light purple).

The extremely wide host range of **JMS** includes: apple, ash, camellia, cherry, cotoneaster, crabapple, dogwood, elm, euonymus, holly, honeylocust, hornbeam, Itea, lilac, linden, magnolia, maple, pear, privet, pyracantha, redbud, serviceberry, stewartia, styrax, yellowwood and zelkova.

The two generations of **JMS** can be expected in mid-May and around August 1 in Middle Tennessee. In other areas, the 1st crawler hatch has coincided with the bloom of

'Ivory Silk' lilac and oakleaf hydrangea. JMS has an extended crawler hatch, which causes the 1st and 2nd generations to overlap.

The battle against **JMS** gets more challenging because our scouts have been able to determine that the crawlers begin forming their protective waxy coating just 3 days after hatch, limiting the window of opportunity for the spray cannon or the Navy Seals to infiltrate and apply a spray. A dense canopy of foliage (holly) creates an impenetrable obstacle that makes thorough coverage next to impossible.

The First Line of Defense should be Horticultural Oil applied as a Dormant Application. There are two basic petroleum oils, superior oil and the summer horticultural oil (this would include ultra-fine oil). Superior oil can only be used during the dormant period. Summer horticultural oil is more highly refined and less likely to cause phytotoxicity to plants. It can be used both as a dormant application and during the growing season. Ultra-fine oil is safer because it is cleaner and can be applied when the temperature is in the 80's.

Spray all host crops one time with a preventative horticultural oil application at the dormant rate from Feb 15 into March or as long as the plant is still dormant. When a known population exists, apply two applications of horticultural oil separated by several weeks beginning around Feb 15. The dormant rate is a 2-3% solution on most labels or 2-3 gallons per 100 gallons.

Determining when Crawlers are Present

Any spraying during the growing season is useless unless it is timed when unprotected crawlers are present. In order to coordinate the crawler (attack) spray application, Intelligence has developed a simple method to determine when crawlers first begin to move to the tender terminal growth.

I am very grateful for lazy people, for they figure out easier ways of doing difficult tasks. Someone in Intelligence (S-2) thought of wrapping a few pieces of double sided sticky tape around the branches or trunk, between the scale and the terminals or right in the middle of and on top of the scale if necessary.

When the crawlers hatch and attempt to crawl upward and outward to the tender parts, they will be trapped by the sticky tape and can be seen with a good hand lens. A few revolutions of black electrical tape can be used instead, with a thin layer of petroleum jelly smeared on it. Mark the branches with flagging ribbon to find them again.

Install the sticky traps and begin monitoring the sticky traps a week or so before emergence is expected. Check the tape every 2-3 days during the period that the crawler stage is expected in order to best time the spray. Look for the purple crawlers. A total kill is never attained, so repeat this procedure again during the next anticipated crawler stage. Adults die after producing crawlers one time. Share your experiences with Extension and Research staff. We may be able to learn more about the timing in a few years.

Change sticky traps 2-3 weeks after each new crawler hatch (emergence). If crawlers continue to be caught on the fresh traps, apply a second insecticide application. Rotate to different modes of action (MOA) for each generation of crawlers.

Recommended Sprays to Kill the Crawler Stage

Realizing that it will be impossible to achieve a total kill of the overwintering adults with a horticultural oil application, if crawlers are found in the sticky traps; the recommended insecticides include the insect growth regulators (IGR):

pyriproxyfen (Distance) at a labeled rate of 8-12 fl oz/100 gallons
or buprofezin (Talus 40SC) at a labeled rate of 21.5 fl oz/100 gallons.

Arena 50 WDG, 2 oz/100 gals “is only for landscape use.”

Additionally, 0.5 to 1% horticultural oil can be tank mixed with Distance or Talus 40SC for improved control. Each is a different mode of action.

Insect death could require 7 days with the IGRs plus a short period for the scale to dry up. After this time, sample to determine if the scale are dead by rubbing it to see if it has dried out. A microscope will be helpful.

Study these labels without having to purchase the product:

Distance	label dated 8-2010	http://www.cdms.net/LDat/ld2AJ007.pdf
Talus 40SC	label dated 3-6-09	http://www.sepro.com/documents/Talus_Label.pdf
Arena 50 WDG	label dated 12-2008	http://www.cdms.net/LDat/ld8N9002.pdf

Read these great handouts and view the color images:

Japanese maple scale handout by Univ of Tenn Extension, Aug, 2011

<https://utextension.tennessee.edu/publications/Documents/W277.pdf>

Japanese maple scale handout by Univ of Maryland Extension, June, 2011

<http://ipmnet.umd.edu/nursery/docs/JapaneseMapleScale-UMD2011.pdf>

Links of good images of White Peach Scale

http://entnemdept.ufl.edu/creatures/orn/scales/white_peach_scale.htm

<http://ccesuffolk.org/assets/Horticulture-Leaflets/White-Prunicola-Scale.pdf>

Summary

- 1- Have Extension identify the scale. This determines when to scout for crawlers.
- 2- Spray a horticultural oil as a dormant application. Make two applications if scale are present separated by one or more weeks.
- 3- Monitor sticky traps to determine when crawlers are present during summer.
- 4- Apply one of the insect growth regulators (IGR) and 0.5 to 1% horticultural oil when crawlers are present.
- 5- Begin monitoring again a week later with fresh sticky traps.
- 6- If crawlers are found, spray the same IGR and oil.
- 7- Begin monitoring again a week before the next generation is expected with fresh sticky traps. Use more traps this time, scatter them; inner rows of blocks are more critical to scout.
- 8- If any crawlers are present, spray the other IGR insecticide mixed with horticultural oil for the second generation scale.
- 9- Begin monitoring again a week later with fresh sticky traps and make an application using the same IGR plus horticultural oil if crawlers are found.
- 10- WPS has a third generation so target crawlers with the same IGR plus horticultural oil that was used for the first generation application.
- 11- If you continue to find crawlers in the interior rows please consider switching to an airblast sprayer that can apply the pesticides in each middle or to handguns.
- 12- Even after you have won, continue spraying Horticultural Oil at least once during late winter and monitor for first generation crawlers.

Comm/Insects/Scale-WPS & JMS FH Handout

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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