Identification



Cinara is the genus of a number of species of aphids that are often tick-sized and can even look like ticks but they are harmless. They often live on the needles and the bark of living Christmas trees. Annually in December our Pest Prevention Service Centers usually receive a few calls about these insects as soon as customers start setting up Christmas trees inside their homes. These aphids do not bite or sting. They will not spread diseases. They generally stay on the tree but may crawl a few feet out where they are easily noticed.

Recommendations

The following recommendations should be relayed to our customers if you visit prior to a customer's Christmas tree being brought inside:



- Trees should be inspected prior to purchase. Tell customers to look along the tips of branches and also deep within the tree – the aphids move to more protected branches as the weather gets colder.
- Trees should be shaken prior to bringing them inside to remove the possible aphids, other insects and dislodged needles.
- Trees can also be sprayed off with water and allowed to dry outdoors. Aphids are soft-bodied insects that are easily washed away.
- Badly infested trees can be returned for a trade-out. The grower should be familiar with aphids and will generally exchange an infested tree for a healthy tree.
- Aphids or insects that leave a tree should be vacuumed. Aphids won't travel far, and most of them will rapidly die once they enter an air-conditioned room.
- Don't squish them – they'll stain the carpet or floors.
- Occasionally ticks, mites, and other miscellaneous arthropods come inside on Christmas trees…so customers should save specimens or take a photo for a Massey representative to identify.

The following protocols should be followed once the tree is inside and pests are found on or around the tree:

- First identify the pest and determine whether it has come in on the tree.
- If it is off of the tree have the customer vacuum those in the rooms that they see them or use your HEPA vacuum if available to help remove the insects.
- In heavy infestations, very carefully spot treat with the residual on rotation and keep away from ornaments and gifts. Then tell the customer to continue vacuuming for the next day or so as the insects should all drop off and die.
- Follow up in 3 days to ensure the insects have all been eliminated.
- We recommend against customers buying and using foggers to kill their aphids or tree pests, especially when the family and pets will be enjoying opening gifts in the nearby area.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Topic Category: Shrub Care

Recordable Verifiable Training Hours: 1.0 to 1.5 hours

Objectives:

- Read and discuss our Shrub Care Protocol.
- Ensure proper understanding by all Specialist
- To **calibrate every Specialist for granular shrub fertilizer applications.**
- **To ensure that every Specialist can perform the proper technique for liquid shrub care applications.**

This meeting will qualify for 1 hour of Department of Ag ID Cardholder Training. Make sure you fill out the Department of Ag ID Cardholder Training form for each Team Member. Keep a copy in the Team Members training file at your office.

Length of lesson: 60 to 90 minutes.

Materials needed:

- Training Guideline (Below)
- Training Document Shrub Care Applications – Granular and Liquid (GreenUp Protocols\Individual Protocols\Lawn Care Basic Application)
- 12-2-14 or 12-0-14 Shrub Fertilizer
- 64 ounce and 32 ounce measuring cup (clean and dry)
- Scale to weigh from 1 to 4 pounds.
- 2 pieces of cardboard from fertilizer pallets to demonstrate applying a handful of fertilizer to 25 sq. ft.
- Pre- and Post- tests.

Training Guidelines:

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- Hand out the Verifiable Training Record Form (VTRF)
- Begin the meeting by defining the training topic and handing out the Pre-test
- Distribute and review the training materials on Shrub Care Application Procedures
    - Allow the Team Members to complete the Pre-test as the application information is discussed.
- Use the Training outline as a guide for key points.
    - Encourage active participation from all Team Members
    - Ask probing questions to discuss key points.
    - Read and answer questions from the test and have the Specialists write in their answers.
    - Encourage group reading
- After reading and reviewing all materials, ask questions to verify the lesson has been understood.
    - Collect the pre-test and discard.
- Thoroughly review and discuss our Shrub Care Protocol.
- **Begin the demonstration portion of the training**
- Show the points of reference for the shrub fertilizer from the protocol.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

- Show 56 ounces of shrub fertilizer in a measuring cup and let them know that this weighs 4 pounds.
- Show that 14 ounces in a measuring cup weighs one pound.
- Explain that one good sized handful (with gloves on) of shrub fertilizer weights about 3 ounces
- Take 4 good sized handfuls of shrub fertilizer (with gloves on) as if you were fertilizing shrubs and put the 4 handfuls into a container such as a 5 gallon bucket. Transfer the material into a measuring cup. The amount of fertilizer in the 4 handfuls should look like 10.5 ounces in a measuring cup, which should weigh roughly 12 ounces or 0.75 pounds.
- Take 2 pieces of cardboard from fertilizer pallets and place them on a concrete surface. Explain that this area is roughly 25 square feet. Have each Specialist take a good size handful of shrub fertilizer and scatter it evenly throughout the 25 square foot area as if making a shrub fertilizer application.

- Demonstrate how shrub spray is properly applied to shrubs around the office.
  - Show the proper technique to get leaf movement using the "figure 8" pattern and spraying from the ground up.
  - Show how to spray plants against a building by treating behind the plants next to the building and spraying outwards. Explain why the backsides of the leaves would be properly treated using this technique.
  - Have all Specialists perform this application with everyone watching and critiquing.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Name _____ Date _____

PRE & POST TEST

1. T or F Certain shrubs are treated preventatively at the time of every initial or regular service.
2. T or F All shrubs are treated preventatively at the time of every regular service.
3. T or F Sagos are sprayed and drenched at the time of every initial or regular service for the prevention or control of Asian Cycad Scale.
4. T or F Imidacloprid controls spider mites and caterpillars.
5. T or F Crape Myrtles that are too tall to spray are drenched at the time of every initial and regular service from spring through fall.
6. T or F Spraying shrubs in a "figure 8" pattern helps to ensure contact to the backsides of the leaves.
7. T or F It is imperative to use proper spray techniques to ensure contact of the new growth and backsides of the leaves and also to keep shrub spray materials from contacting window and the structure.
8. T or F Particular attention must be given to ensure that shrub spray drift does not contact people passing by or neighbors who may be in their lawns at the time of our treatment.
9. T or F One pound of shrub fertilizer looks like 14 ounces in a measuring cup.
10. At the equivalent rate of 8 pounds per 1000 sq. ft., 1 pound of shrub fertilizer would cover _____ sq. ft.
    a. 50
    b. 100
    c. 125
    d. 150
11. One good sized handful of fertilizer should cover about _____ sq. ft. at the equivalent rate of 8 pounds per 1000 sq. ft.
    a. 25
    b. 50
    c. 75
    d. 100

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

12. T or F I have been successfully calibrated to perform shrub fertilizer applications and have demonstrated my ability to perform shrub spray applications.

13. T or F When bees are present or when the shrubs are in full bloom, preventative applications are not performed, but soil drench methods can be utilized when shrub damaging insects or diseases are present.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Answer Sheet

1. T or F Certain shrubs are treated preventatively at the time of every initial or regular service.
2. T or F All shrubs are treated preventatively at the time of every regular service.
3. T or F Sagos are sprayed and drenched at the time of every initial or regular service for the prevention or control of Asian Cycad Scale.
4. T or F Imidacloprid controls spider mites and caterpillars.
5. T or F Crape Myrtles that are too tall to spray are drenched at the time of every initial and regular service from spring through fall.
6. T or F Spraying shrubs in a "figure 8" pattern helps to ensure contact to the backsides of the leaves.
7. T or F It is imperative to use proper spray techniques to ensure contact of the new growth and backsides of the leaves and also to keep shrub spray materials from contacting window and the structure.
8. T or F Particular attention must be given to ensure that shrub spray drift does not contact people passing by or neighbors who may be in their lawns at the time of our treatment.
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10. At the equivalent rate of 8 pounds per 1000 sq. ft., 1 pound of shrub fertilizer would cover _____ sq. ft.
    a. 50
    b. 100
    c. 125
    d. 150
11. One good sized handful of fertilizer should cover about _____ sq. ft. at the equivalent rate of 8 pounds per 1000 sq. ft.
    a. 25
    b. 50
    c. 75
    d. 100

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

12. T or F I have been successfully calibrated to perform shrub fertilizer applications and have demonstrated my ability to perform shrub spray applications. The correct answer will be true if you performed the training properly.

13. T or F When bees are present or when the shrubs are in full bloom, preventative applications are not performed, but soil drench methods can be utilized when shrub damaging insects or diseases are present.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

Objective

Our Shrub Care Service is based on the principles of Integrated Pest Management and with great consideration of the 5 Key Principles.

Liquid Shrub Care Application Protocol

Shrub pest treatments are performed when plants either have a current pest issue (curative) or preventatively when particular plants are known to be susceptible to particular insect or disease issues. Shrubs that are treated on a preventative basis with every initial and regular service include:

- Azalea
- Crape myrtle
- Camellia
- Gardenia
- Sago
- Pittosporum
- Indian Hawthorne
- Holly
- Knock-Out Roses

The list above may be expanded (not reduced) depending on the geographical location and specific concerns in the Service Center.

This service is performed using a pump and droptank system from the Lawn Care vehicle. The products used will vary depending on the time of year and the most prevalent insect or disease problems.

In the cooler times of the year, Horticultural Oil is used for the insecticide and Kalmor is used for the fungicide. Horticultural oil is a mineral oil. It controls insects and mites through suffocation and by breaking down their exoskeleton. Horticultural oil is not systemic. It controls on contract only, so a thorough application of the front and backsides of the leaves is very important. Kalmor is a copper-based fungicide/bactericide. It is also not systemic. There are a few bacterial diseases that are prevalent during the cooler spring months as well as downy mildew, which are well controlled by copper-based materials.

Tristar is used as the insecticide in the later spring months (Florida and Louisiana).

Through the summer months, our I&D Slurry is used. The slurry contains Imidacloprid, Armada or Transom and wetting agent. Imidacloprid will do an excellent job on insects such as aphids, lace bugs, thrips, soft scale and mealybugs. It is important to recognize that Imidacloprid does not control caterpillars or spider mites. Armada and Transom do a good job on a wide variety of fungal disease issues. They do not control Pythium, phytophthora or Downy Mildew. There are many times when specific pest control materials will be needed to control specific pests. Use them according to label directions for the specific insect or disease problem. In these cases, the plants needing treatment are typically very limited; a backpack sprayer should be used.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

All Sagos are sprayed and drenched to prevent Asian Cycad Scale. From spring through fall, Crape myrtles that are too tall to spray are drenched to prevent aphids. The shrub gun can be used for this purpose; adjust the gun to course spray and treat the trunk ground in the root zone area until puddling occurs.

For the protection of pollinating insects, do not spray the foliage of shrubs that are in full bloom or if pollinators are in the area. If insect problems exist or if preventive insect applications are necessary and pollinators are in the area, perform a drench of the root system with the I&D mixture rather than spraying the foliage.

Equipment

When performing liquid treatments using the lawn care vehicle, a shrub gun is utilized. The shrub gun has a nozzle that can be adjusted to spray a pin-stream to wide cone pattern. When performing liquid applications from a backpack applicator, either an 8010E or adjustable cone style tip is used.

Technique

With either piece of equipment, the Specialist must use techniques that achieve coverage of the front side and back sides of all leaves including new growth. Properly using the shrub gun will include almost continual adjustment of the gun to create "leaf movement". As you move through the landscape you should be adjusting the nozzle to change the spray pattern according to thickness and hardiness of the plant and to allow pressure to fold back leaves to allow material to thoroughly coat both sides of the leaves without doing damage to ornamental. Treating with a “Figure 8” pattern is beneficial to get the spray pattern to swirl and move the leaves so the backsides can be reached.

- Covering the backsides of the leaves requires the most effort and skill. This can be achieved by spraying from behind the plant when it is against a structure, by starting from ground level and spraying upwards or by spraying from the side of the plant and moving the leaves so the backs of the leaves are seen.
- Treating the new growth must also be a conscious effort if the shrubbery is not well pruned. Keep in mind that aphids will primarily feed on the new growth.
- Treating the front sides of the leaves may be achieved when treating the backsides of the leaves; however, additional treatment may be needed to get complete coverage.
- Movement of the spray pattern should be at a pace to wet the leaves, but not so slow that they are dripping excessively. When you look at the shrub after treatment, all the leaves should be wet and dripping slightly.

It may also be beneficial to drench the root system of the plant with systemic materials. Drenching the root system with systemic materials is beneficial to get more of the control materials inside the plant and will achieve a more thorough and longer lasting control. The shrub gun will work for this application; however, a lawn wand may be beneficial for drenching larger areas in a more time efficient manner. Shrub guns will typically apply roughly 2 gallons a minute; the lawn wand can apply up to 5 gallons per minute. When drenching just one or two plants, a 2.5 gallon jug can be mixed and utilized.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS



Figure 1



Figure 2

In Figure 1, the Specialist has positioned himself against the structure and spraying away from the building to keep the material off the structure and windows. He is also spraying upwards from ground level to ensure coverage of the backsides of the leaves.
In Figure 2, the Specialist is drenching the ground below using the shrub gun.

Safety and Liability

It is important to be consciously aware that the mist from a liquid application can move away from the target if not careful; particularly on windy days. Particular attention must be paid to ensure that the spray does not contact people passing by or neighbors who may be in their lawns while the application is being performed. Also be careful to ensure that the spray does not contact the customer's window, patio furniture or other non-target surfaces that could be stained or damaged. If this does occur, wash the windows or other surfaces with clean water before the material has a chance to dry.
It is also important to be on the lookout for nesting birds, pollinators or large quantities of beneficial insects. If treatment is required in these situations, utilize the drench method rather than the spray method. If treatment is not required, do not treat.

Do not allow pesticides of any kind to contact bodies of water or fish ponds. Many of the materials we use can be deadly to fish.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

Granular Fertilizer Applications

Nutritional applications are performed seasonally as prescribed by our Agronomic Program or when nutritional issues arise. This application is typically performed by hand and typical application rates range from 6 to 8 pounds per 1000 sq. ft. depending on the season. Placement of the fertilizer should be evenly from the trunk to a few feet past the dripline. The dripline of the shrub or tree is the outer edge of the canopy. The roots of an established tree or shrub reach well beyond the dripline.

Points of reference:
1 pound of fertilizer by weight looks like 14 ounces in a measuring cup.
4 pounds of fertilizer by weight looks like 56 ounces in a measuring cup.



4 pounds of fertilizer

A good size hand full of fertilizer (wearing gloves) weighs about 3 ounces by weight. To confirm this without an accurate scale, take 4 good sized handfuls of shrub fertilizer as if you were fertilizing shrubs and put the 4 handfuls into a container such as a 5 gallon bucket. Transfer the material into a measuring cup. The amount of fertilizer in the 4 handfuls should look like 10.5 ounces in a measuring cup, which should weigh roughly 12 ounces or 0.75 pounds.

One good sized handful of shrub fertilizer weighs about 3 ounces (or 0.1875 pounds). This amount of fertilizer covers roughly 25 sq. ft. when the rate is 8 pounds per 1000 sq. ft. If the rate is 6 pounds per 1000 sq. ft., a 3 ounce handful should cover roughly 30 sq. ft.

MASSEY GreenUP Landscape Services

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS



The shrub bed pictured above is roughly 25 square feet (3 feet wide x 8.33 feet long). The three azaleas picture above could be fertilized with one good sized handful of fertilizer. This amount of fertilizer would be spread evenly throughout this area to achieve a proper application. Fertilizer should never be left as clumps or visible piles.

When fertilizing small trees and larger shrubs, the same rate per square foot is used, but due to the larger area being fertilized, more fertilizer per plant will be applied.
Keep in mind that applying 8 pounds of our 12-2-14 or 12-0-14 fertilizer per 1000 sq. ft. applies 0.96 pounds of nitrogen per 1000 sq. ft. 1 pound of nitrogen per 1000 sq. ft. is the maximum allowable rate per application as per Florida Department of Agriculture Rule. If a shrub or tree is particularly nutritionally deficient, more frequent applications is preferred rather than heavier applications. Additionally, the plant is better able to assimilate the nutrients applied.

Sagos and palms are fertilized with our 8-2-12 or 8-0-12 at a rate of 12 pounds per 1000 sq. ft.

Any fertilizer debris on impervious surfaces must be removed with the power blower immediately after treatment to avoid staining surfaces and to comply with the Green Industries Best Management Practices. Do not allow any fertilizer to get into a body of water or fish pond.

Technical Bulletin

Pseudomonas cichorii and *Xanthomonas*

Pseudomonas cichorii and *Xanthomonas*

Pseudomonas cichorii and *Xanthomonas* are the causal agents of leaf spot and blight diseases of ornamentals*. P. cichorii* is a soil bacterium that is pathogenic to plants with a wide host range. *Xanthomonas* is a large bacterium that causes disease in hundreds of plant hosts, including many economically important crops.

Host plants/species affected (abbreviated list) by the combined pathogens.

Camellia
Chrysanthemum
Coreopsis
Duranta erecta, gold mound
Gerbera
Helianthus, sunflower
Hibiscus
Hydrangea
Schefflera arboricola

Symptoms may vary depending on the host and the infected part of the plant. First appearance is of lesions that develop either at the leaf margin, near the midvein and/or are randomly distributed as leaf spots. Developing lesions are roughly circular and are rarely confined to the inter-veinal areas. These enlarge and turn dark brown or black. Lesions may coalesce to form very large necrotic areas and may affect the whole leaf. The size of the lesions varies depending on the environmental conditions; in high humidity conditions larger lesions and rotting of infected tissues are observed, whereas in low humidity conditions lesions may only be a few millimetres diameter and the disease may eventually cease development. Blight, necrosis, abnormal leaf color, abnormal leaf fall (up to the point of complete defoliation), are common symptoms across all host plants. Rarely however has the death of the plant been reported.











Control

Control of disease caused by *P. cichorii* and *Xanthomonas* is difficult to achieve when conditions favor the pathogen. Soil irrigation rather than overhead watering and proper air circulation will reduce the likelihood of infection, disease development, and are beneficial components of control. The spread of the bacterium may be reduced by decontaminating tools and hands after handling diseased plants. High plant densities and over-fertilization, especially with high nitrogen fertilizers, should be avoided. Control using copper compounds or antibiotics has been demonstrated in trials, but success in the field is problematic unless combined with proper cultural controls.

When product controls are necessary, Kalmor (Copper Hydroxide) should be used as a foliar spray with adequate coverage to the upper and lower leaf surfaces. Read the product label for usage precautions.

The usage rate for Kalmor is equivalent to 16 ounces by weight per 50 gallons of water (add 1 oz. wetting agent per 5 gallons of water out of a drop tank) or 1 level tablespoon Kalmor with ½ oz. of wetting agent per gallon of water if a backpack sprayer is being used. Kalmor applications must be repeated in 7 to 10 days.

WEEKLY TRAINING SESSION

Scale Insects

Topic Category: Lawn

Recordable Verifiable Training Hours: 1.0

Objectives: This lesson is designed to teach Scale Insects – Life cycle and Identification.

Length of lesson: Approx 60 minutes.

Materials needed:

- Training Guideline
- Training Document - Shrub Damaging Insects - Scales
- Collect samples of Scale Insects from the field, if available.
- Pre- and Post- tests.

Training Guidelines:

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- Begin the meeting by defining the training topic and handing out the Pre-test
    - Allow a few minutes for Team Members to complete the Pre-test.
    - Collect the pre-test and hand out the Verifiable Training Record Form (VTRF)
- Distribute and review the training materials on Scale Insects
- Use the Training outline as a guide for key points.
    - Encourage active participation from all Team Members
    - Ask probing questions to develop key points
    - Encourage group reading
- After reading and reviewing all materials, ask questions to verify the lesson has been understood.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University

WEEKLY TRAINING SESSION

Scale Insects

Name _____ Date _____

PRE & POST TEST

1. T or F Scales are piercing-sucking insects that live under a wax covering.

2. Scales are classified as armored or soft scales depending on _____.
   a. Their mouthpart type
   b. How big they are
   c. Whether or not their wax covering is attached to their body.
   d. How hard they are to kill.

3. Scales feed on _____.
   a. The top sides of the leaves
   b. The bottom sides of the leaves
   c. The twigs and branches
   d. All of the above depending on the type of scale.

4. T or F The wax covering of an armored scale is attached to its body.

5. T or F Sooty mold is not found associated with armored scales.

6. Adult male scales are _____
   a. Tiny winged gnats
   b. Bigger than the females
   c. Smaller than the females
   d. About the same size as the females

7. Adult female scales are _____.
   a. Wingless and remain under the wax covering
   b. Known as crawlers
   c. Smaller than the males
   d. Always red

8. The best treatment for Armored Scales is _____.
   a. Horticultural Oil
   b. Safari
   c. Imidacloprid
   d. Bifenthrin

WEEKLY TRAINING SESSION

Scale Insects

PRE & POST TEST ANSWER KEY

1. T or F Scales are piercing-sucking insects that live under a wax covering.

2. Scales are classified as armored or soft scales depending on _____.
   a. Their mouthpart type
   b. How big they are
   c. Whether or not their wax covering is attached to their body.
   d. How hard they are to kill.

3. Scales feed on _____.
   a. The top sides of the leaves
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   c. The twigs and branches
   d. All of the above depending on the type of scale.

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7. Adult female scales are _____.
   a. Wingless and remain under the wax covering
   b. Known as crawlers
   c. Smaller than the males
   d. Always red

9. The best treatment for Armored Scales is _____.
   a. Horticultural Oil
   b. Safari
   c. Imidacloprid
   d. Bifenthrin

Shrub Damaging Insects

Scales

Scales

- Scales are piercing-sucking insects that live under a wax covering.
- They are classified as armored scales or soft scales depending on whether or not the covering is attached to the insect.
- Depending on the type of scale, they may feed on the top or bottom sides of the leaves or on the twigs and branches.
- They are stationary most of their life.



Typical Scale Lifecycle

- Adult male scales are tiny winged gnats.
- Adult female scales are wingless and remain under the wax covering.
- Eggs are laid under the wax covering.
- Young nymphs, known as crawlers, emerge from under the wax covering.
- They move across the plant until finding a spot to feed.
- They insert their piercing-sucking mouthparts and remain stationary until adult.
- The wax covering is made with a combination of wax and honeydew.



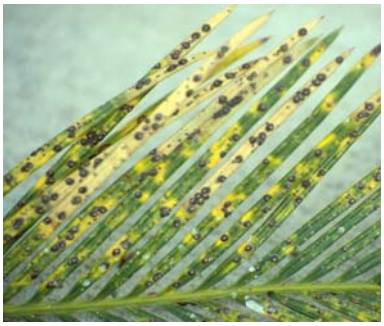
Armored Scales

- The wax covering of an Armored Scale is not attached to its body.
  - If you pry up the wax covering, the insect can be found underneath.
  - Sooty mold is not found with armored scales.



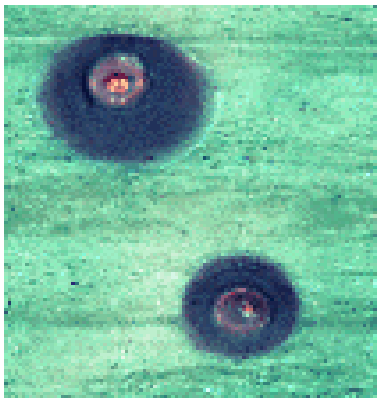
Florida Red Scale

- Florida Red Scale is an armored scale.
- It is commonly found on Sagos, Podocarpus and Holly.
- They can be found primarily on the top sides of the leaves, but may also be found on the bottom sides.



Florida Red Scale

- Florida Red Scale is dark reddish-brown to black with a lighter colored elevated tip in the middle.
- Its size ranges from about 1/20th to 1/8th of an inch



False Oleander Scale

- False Oleander Scale is an armored scale.
- It is commonly found on Magnolia, Oleander, Elaeagnus (Silverthorn).
- It is typically found on the top sides of the leaves.



False Oleander Scale

- False Oleander Scale is tear dropped shaped, white with a brown area on the front.
- Its size ranges from 1/20th to 1/6th of an inch.



Asian Cycad Scale

- Asian Cycad Scale is an armored scale that looks very similar to Tea Scale or False Oleander Scale.
- Asian Cycad Scale was introduced into Miami in 1992 and quickly made its way throughout Florida.



Asian Cycad Scale

- This scale is very aggressive and will quickly and completely cover the fronds and trunk.



Asian Cycad Scale

- Preventative treatment must occur with every regular service by drenching all sagos with our insect and disease slurry.
- The leaves, trunk and root system must be thoroughly drenched.



Asian Cycad Scale

- Treatment for existing problems must be very aggressive using our Insect and Disease Slurry, which contains Imidacloprid (Zenith).
- Horticultural Oil should be added to improve control.
- In severe cases, Safari should be used.



Asian Cycad Scale

- The leaves, trunk and root system must be thoroughly drenched.
- Follow up every 14 days until control has been achieved.
- Control will be more easily achieved if the affected/damaged leaves can be removed.



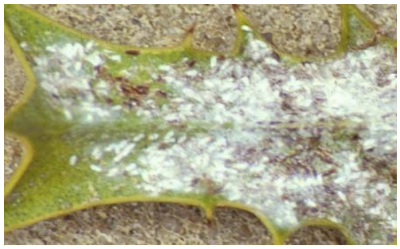
Tea Scale

- Tea Scale is an armored scale.
- It is commonly found on Holly, Camellias and Ilex Shilling.
- They are typically found on the bottom sides of the leaves usually on the lower growth or against a wall or other shady area.



Tea Scale

- Tea Scale is very small, about 1/30th of an inch.
- They are elongate in shape.
- The males are white and the females are brown.
- White web-like filaments can be seen in heavy infestations.



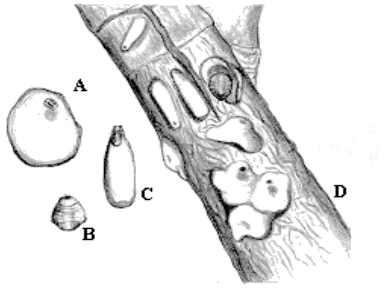
Peach Scale

- Peach Scale is an armored scale.
- It is commonly found on Sinense Ligustrum, Chinaberry, Peach trees and Hibiscus.
- It is typically found on the woody portions of the plant.



Peach Scale

- Peach scale are very small, about 1/25th of an inch.
- They are, round to elongate, white to off white with a small yellow to reddish spot at one end.



White peach scale. A, Female armor. B, Female. C, Male armor. D, Damage.

Soft Scales

- The wax covering of a soft scale is attached to its body.
  - If you pry up the wax covering of a soft scale, the insect will be attached to the wax covering.
  - Sooty mold will be found growing on the honeydew excretions of the soft scales.



Florida Wax Scale

- Florida Wax Scale is a soft scale.
- It can be found on Holly, Hawthorn and Jasmine.
- They are typically found on the top sides of the leaves but may also be found on the young stems.



Florida Wax Scale

- Florida Wax Scale range in size from 1/20th to 1/8th of an inch.
- They are white to pinkish-white, round to slightly oblong.
- The eggs are red and can be seen under the female when the wax covering is lifted.



Other Wax Scales

- There are many other wax scales…
  - Indian Wax Scale
  - Chinese Wax Scale
  - Japanese Wax Scale
  - Barnacle Scale
- Most are white to off white and globular in shape.



Cottony Cushion Scale

- Cottony Cushion Scale is a soft scale.
- It can be found on Pittosporum and many others.
- They are typically found under the leaves and on young stems.



Cottony Cushion Scale

- Cottony Cushion Scale Range from 1/20th to over 1/4th of an inch.
- The crawlers are 1/20th of an inch and red with dark legs, antennae and long hairs at the end of their body. They will crawl about the plant until the egg sack is formed.
- The mature females have a large fluted egg sack.
- About 600 to 800 eggs are laid in the sack.





Hemispherical Scale

- Hemispherical Scale is a soft scale.
- It can be found on Sagos, ferns, palms, citrus and others.
- They are found on the front and back sides of the leaves as well as the young branches.



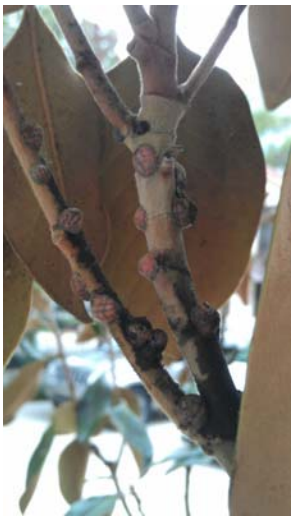
Hemispherical Scale

- Hemispherical Scale vary in size depending on the host plant species.
- The young are yellowish and semi-transparent.
- The adult female is dark brown and resemble a helmet in shape.



Tuliptree Scale

- Tuliptree Scale is one of the largest soft scales in the U.S.
- Mature females grow to over 1/4th inch in diameter.
- The waxy covering of a mature female varies from light grayish green to pinkish orange mottled with black.
- Hosts - Magnolia, Yellow Poplar and Tuliptrees



Tuliptree Scale

- This pest overwinters as second instar nymphs and resumes feeding in early spring.
- Males emerge from the waxy scale covering as small, two winged individuals. They mate with females, and then die.
- By summer, mature females give birth to first instar nymphs (crawlers). Each female may produce as many as 3,000 crawlers over several weeks.
- Once the crawlers find a favorable site, they insert their piercing-sucking mouthparts into the vascular system of the tree and begin to feed.



Scale Insect Control

- Our regular shrub care treatments utilizes Imidacloprid (Zenith), which is excellent for controlling most shrub damaging insects, including scales.
- Imidacloprid is a systemic insecticide, which means that it will enter into the plant through the leaves and the roots and kill the insects when they feed on the plant.
- Horticultural oil can be added to optimize the results when scale populations are particularly high.
- Safari will provide better results when dealing with armored scales.
- Scale insects can be very difficult to control and will usually require a 2 week follow-up.



Scale Insect Control

- Mid-sized trees can be treated by way of Imidacloprid drench to the root system.
  - See the Mid-sized Tree Root Drench Protocol
- Larger trees can be treated by way of direct injection using Imi-jet.

Scale Insect Control

- It is very important to be able to identify scale insects when performing shrub inspections.
- It is not necessary to know the name of the scale.
- If you know it is a scale insect, but you do not know its name, simply identify it as a scale.
- You know it is an insect.
- You know it causes damage to the plant.
- You know it needs to be killed.
- Our service is the solution.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Topic Category: Shrub Care

Recordable Verifiable Training Hours: 1.0 to 1.5 hours

Objectives:

- Read and discuss our Shrub Care Protocol.
- Ensure proper understanding by all Specialist
- To **calibrate every Specialist for granular shrub fertilizer applications.**
- **To ensure that every Specialist can perform the proper technique for liquid shrub care applications.**

This meeting will qualify for 1 hour of Department of Ag ID Cardholder Training. Make sure you fill out the Department of Ag ID Cardholder Training form for each Team Member. Keep a copy in the Team Members training file at your office.

Length of lesson: 60 to 90 minutes.

Materials needed:

- Training Guideline (Below)
- Training Document Shrub Care Applications – Granular and Liquid (GreenUp Protocols\Individual Protocols\Lawn Care Basic Application)
- 12-2-14 or 12-0-14 Shrub Fertilizer
- 64 ounce and 32 ounce measuring cup (clean and dry)
- Scale to weigh from 1 to 4 pounds.
- 2 pieces of cardboard from fertilizer pallets to demonstrate applying a handful of fertilizer to 25 sq. ft.
- Pre- and Post- tests.

Training Guidelines:

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- Hand out the Verifiable Training Record Form (VTRF)
- Begin the meeting by defining the training topic and handing out the Pre-test
- Distribute and review the training materials on Shrub Care Application Procedures
    - Allow the Team Members to complete the Pre-test as the application information is discussed.
- Use the Training outline as a guide for key points.
    - Encourage active participation from all Team Members
    - Ask probing questions to discuss key points.
    - Read and answer questions from the test and have the Specialists write in their answers.
    - Encourage group reading
- After reading and reviewing all materials, ask questions to verify the lesson has been understood.
    - Collect the pre-test and discard.
- Thoroughly review and discuss our Shrub Care Protocol.
- **Begin the demonstration portion of the training**
- Show the points of reference for the shrub fertilizer from the protocol.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

- Show 56 ounces of shrub fertilizer in a measuring cup and let them know that this weighs 4 pounds.
- Show that 14 ounces in a measuring cup weighs one pound.
- Explain that one good sized handful (with gloves on) of shrub fertilizer weights about 3 ounces
- Take 4 good sized handfuls of shrub fertilizer (with gloves on) as if you were fertilizing shrubs and put the 4 handfuls into a container such as a 5 gallon bucket. Transfer the material into a measuring cup. The amount of fertilizer in the 4 handfuls should look like 10.5 ounces in a measuring cup, which should weigh roughly 12 ounces or 0.75 pounds.
- Take 2 pieces of cardboard from fertilizer pallets and place them on a concrete surface. Explain that this area is roughly 25 square feet. Have each Specialist take a good size handful of shrub fertilizer and scatter it evenly throughout the 25 square foot area as if making a shrub fertilizer application.

- Demonstrate how shrub spray is properly applied to shrubs around the office.
  - Show the proper technique to get leaf movement using the "figure 8" pattern and spraying from the ground up.
  - Show how to spray plants against a building by treating behind the plants next to the building and spraying outwards. Explain why the backsides of the leaves would be properly treated using this technique.
  - Have all Specialists perform this application with everyone watching and critiquing.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Name _____ Date _____

PRE & POST TEST

1. T or F Certain shrubs are treated preventatively at the time of every initial or regular service.
2. T or F All shrubs are treated preventatively at the time of every regular service.
3. T or F Sagos are sprayed and drenched at the time of every initial or regular service for the prevention or control of Asian Cycad Scale.
4. T or F Imidacloprid controls spider mites and caterpillars.
5. T or F Crape Myrtles that are too tall to spray are drenched at the time of every initial and regular service from spring through fall.
6. T or F Spraying shrubs in a "figure 8" pattern helps to ensure contact to the backsides of the leaves.
7. T or F It is imperative to use proper spray techniques to ensure contact of the new growth and backsides of the leaves and also to keep shrub spray materials from contacting window and the structure.
8. T or F Particular attention must be given to ensure that shrub spray drift does not contact people passing by or neighbors who may be in their lawns at the time of our treatment.
9. T or F One pound of shrub fertilizer looks like 14 ounces in a measuring cup.
10. At the equivalent rate of 8 pounds per 1000 sq. ft., 1 pound of shrub fertilizer would cover _____ sq. ft.
    a. 50
    b. 100
    c. 125
    d. 150
11. One good sized handful of fertilizer should cover about _____ sq. ft. at the equivalent rate of 8 pounds per 1000 sq. ft.
    a. 25
    b. 50
    c. 75
    d. 100

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

12. T or F I have been successfully calibrated to perform shrub fertilizer applications and have demonstrated my ability to perform shrub spray applications.

13. T or F When bees are present or when the shrubs are in full bloom, preventative applications are not performed, but soil drench methods can be utilized when shrub damaging insects or diseases are present.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Answer Sheet

1. T or F Certain shrubs are treated preventatively at the time of every initial or regular service.
2. T or F All shrubs are treated preventatively at the time of every regular service.
3. T or F Sagos are sprayed and drenched at the time of every initial or regular service for the prevention or control of Asian Cycad Scale.
4. T or F Imidacloprid controls spider mites and caterpillars.
5. T or F Crape Myrtles that are too tall to spray are drenched at the time of every initial and regular service from spring through fall.
6. T or F Spraying shrubs in a "figure 8" pattern helps to ensure contact to the backsides of the leaves.
7. T or F It is imperative to use proper spray techniques to ensure contact of the new growth and backsides of the leaves and also to keep shrub spray materials from contacting window and the structure.
8. T or F Particular attention must be given to ensure that shrub spray drift does not contact people passing by or neighbors who may be in their lawns at the time of our treatment.
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    a. 50
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    c. 125
    d. 150
11. One good sized handful of fertilizer should cover about _____ sq. ft. at the equivalent rate of 8 pounds per 1000 sq. ft.
    a. 25
    b. 50
    c. 75
    d. 100

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

12. T or F I have been successfully calibrated to perform shrub fertilizer applications and have demonstrated my ability to perform shrub spray applications. The correct answer will be true if you performed the training properly.

13. T or F When bees are present or when the shrubs are in full bloom, preventative applications are not performed, but soil drench methods can be utilized when shrub damaging insects or diseases are present.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

Objective

Our Shrub Care Service is based on the principles of Integrated Pest Management and with great consideration of the 5 Key Principles.

Liquid Shrub Care Application Protocol

Shrub pest treatments are performed when plants either have a current pest issue (curative) or preventatively when particular plants are known to be susceptible to particular insect or disease issues. Shrubs that are treated on a preventative basis with every initial and regular service include:

- Azalea
- Crape myrtle
- Camellia
- Gardenia
- Sago
- Pittosporum
- Indian Hawthorne
- Holly
- Knock-Out Roses

The list above may be expanded (not reduced) depending on the geographical location and specific concerns in the Service Center.

This service is performed using a pump and droptank system from the Lawn Care vehicle. The products used will vary depending on the time of year and the most prevalent insect or disease problems.

In the cooler times of the year, Horticultural Oil is used for the insecticide and Kalmor is used for the fungicide. Horticultural oil is a mineral oil. It controls insects and mites through suffocation and by breaking down their exoskeleton. Horticultural oil is not systemic. It controls on contract only, so a thorough application of the front and backsides of the leaves is very important. Kalmor is a copper-based fungicide/bactericide. It is also not systemic. There are a few bacterial diseases that are prevalent during the cooler spring months as well as downy mildew, which are well controlled by copper-based materials.

Tristar is used as the insecticide in the later spring months (Florida and Louisiana).

Through the summer months, our I&D Slurry is used. The slurry contains Imidacloprid, Armada or Transom and wetting agent. Imidacloprid will do an excellent job on insects such as aphids, lace bugs, thrips, soft scale and mealybugs. It is important to recognize that Imidacloprid does not control caterpillars or spider mites. Armada and Transom do a good job on a wide variety of fungal disease issues. They do not control Pythium, phytophthora or Downy Mildew. There are many times when specific pest control materials will be needed to control specific pests. Use them according to label directions for the specific insect or disease problem. In these cases, the plants needing treatment are typically very limited; a backpack sprayer should be used.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

All Sagos are sprayed and drenched to prevent Asian Cycad Scale. From spring through fall, Crape myrtles that are too tall to spray are drenched to prevent aphids. The shrub gun can be used for this purpose; adjust the gun to course spray and treat the trunk ground in the root zone area until puddling occurs.

For the protection of pollinating insects, do not spray the foliage of shrubs that are in full bloom or if pollinators are in the area. If insect problems exist or if preventive insect applications are necessary and pollinators are in the area, perform a drench of the root system with the I&D mixture rather than spraying the foliage.

Equipment

When performing liquid treatments using the lawn care vehicle, a shrub gun is utilized. The shrub gun has a nozzle that can be adjusted to spray a pin-stream to wide cone pattern. When performing liquid applications from a backpack applicator, either an 8010E or adjustable cone style tip is used.

Technique

With either piece of equipment, the Specialist must use techniques that achieve coverage of the front side and back sides of all leaves including new growth. Properly using the shrub gun will include almost continual adjustment of the gun to create "leaf movement". As you move through the landscape you should be adjusting the nozzle to change the spray pattern according to thickness and hardiness of the plant and to allow pressure to fold back leaves to allow material to thoroughly coat both sides of the leaves without doing damage to ornamental. Treating with a “Figure 8” pattern is beneficial to get the spray pattern to swirl and move the leaves so the backsides can be reached.

- Covering the backsides of the leaves requires the most effort and skill. This can be achieved by spraying from behind the plant when it is against a structure, by starting from ground level and spraying upwards or by spraying from the side of the plant and moving the leaves so the backs of the leaves are seen.
- Treating the new growth must also be a conscious effort if the shrubbery is not well pruned. Keep in mind that aphids will primarily feed on the new growth.
- Treating the front sides of the leaves may be achieved when treating the backsides of the leaves; however, additional treatment may be needed to get complete coverage.
- Movement of the spray pattern should be at a pace to wet the leaves, but not so slow that they are dripping excessively. When you look at the shrub after treatment, all the leaves should be wet and dripping slightly.

It may also be beneficial to drench the root system of the plant with systemic materials. Drenching the root system with systemic materials is beneficial to get more of the control materials inside the plant and will achieve a more thorough and longer lasting control. The shrub gun will work for this application; however, a lawn wand may be beneficial for drenching larger areas in a more time efficient manner. Shrub guns will typically apply roughly 2 gallons a minute; the lawn wand can apply up to 5 gallons per minute. When drenching just one or two plants, a 2.5 gallon jug can be mixed and utilized.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS



Figure 1



Figure 2

In Figure 1, the Specialist has positioned himself against the structure and spraying away from the building to keep the material off the structure and windows. He is also spraying upwards from ground level to ensure coverage of the backsides of the leaves.
In Figure 2, the Specialist is drenching the ground below using the shrub gun.

Safety and Liability

It is important to be consciously aware that the mist from a liquid application can move away from the target if not careful; particularly on windy days. Particular attention must be paid to ensure that the spray does not contact people passing by or neighbors who may be in their lawns while the application is being performed. Also be careful to ensure that the spray does not contact the customer's window, patio furniture or other non-target surfaces that could be stained or damaged. If this does occur, wash the windows or other surfaces with clean water before the material has a chance to dry.
It is also important to be on the lookout for nesting birds, pollinators or large quantities of beneficial insects. If treatment is required in these situations, utilize the drench method rather than the spray method. If treatment is not required, do not treat.

Do not allow pesticides of any kind to contact bodies of water or fish ponds. Many of the materials we use can be deadly to fish.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

Granular Fertilizer Applications

Nutritional applications are performed seasonally as prescribed by our Agronomic Program or when nutritional issues arise. This application is typically performed by hand and typical application rates range from 6 to 8 pounds per 1000 sq. ft. depending on the season. Placement of the fertilizer should be evenly from the trunk to a few feet past the dripline. The dripline of the shrub or tree is the outer edge of the canopy. The roots of an established tree or shrub reach well beyond the dripline.

Points of reference:
1 pound of fertilizer by weight looks like 14 ounces in a measuring cup.
4 pounds of fertilizer by weight looks like 56 ounces in a measuring cup.



4 pounds of fertilizer

A good size hand full of fertilizer (wearing gloves) weighs about 3 ounces by weight. To confirm this without an accurate scale, take 4 good sized handfuls of shrub fertilizer as if you were fertilizing shrubs and put the 4 handfuls into a container such as a 5 gallon bucket. Transfer the material into a measuring cup. The amount of fertilizer in the 4 handfuls should look like 10.5 ounces in a measuring cup, which should weigh roughly 12 ounces or 0.75 pounds.

One good sized handful of shrub fertilizer weighs about 3 ounces (or 0.1875 pounds). This amount of fertilizer covers roughly 25 sq. ft. when the rate is 8 pounds per 1000 sq. ft. If the rate is 6 pounds per 1000 sq. ft., a 3 ounce handful should cover roughly 30 sq. ft.

MASSEY GreenUP Landscape Services

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS



The shrub bed pictured above is roughly 25 square feet (3 feet wide x 8.33 feet long). The three azaleas picture above could be fertilized with one good sized handful of fertilizer. This amount of fertilizer would be spread evenly throughout this area to achieve a proper application. Fertilizer should never be left as clumps or visible piles.

When fertilizing small trees and larger shrubs, the same rate per square foot is used, but due to the larger area being fertilized, more fertilizer per plant will be applied.
Keep in mind that applying 8 pounds of our 12-2-14 or 12-0-14 fertilizer per 1000 sq. ft. applies 0.96 pounds of nitrogen per 1000 sq. ft. 1 pound of nitrogen per 1000 sq. ft. is the maximum allowable rate per application as per Florida Department of Agriculture Rule. If a shrub or tree is particularly nutritionally deficient, more frequent applications is preferred rather than heavier applications. Additionally, the plant is better able to assimilate the nutrients applied.

Sagos and palms are fertilized with our 8-2-12 or 8-0-12 at a rate of 12 pounds per 1000 sq. ft.

Any fertilizer debris on impervious surfaces must be removed with the power blower immediately after treatment to avoid staining surfaces and to comply with the Green Industries Best Management Practices. Do not allow any fertilizer to get into a body of water or fish pond.

WEEKLY TRAINING SESSION

Scale Insects

Topic Category: Lawn

Recordable Verifiable Training Hours: 1.0

Objectives: This lesson is designed to teach Scale Insects – Life cycle and Identification.

Length of lesson: Approx 60 minutes.

Materials needed:

- Training Guideline
- Training Document - Shrub Damaging Insects - Scales
- Collect samples of Scale Insects from the field, if available.
- Pre- and Post- tests.

Training Guidelines:

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- Begin the meeting by defining the training topic and handing out the Pre-test
    - Allow a few minutes for Team Members to complete the Pre-test.
    - Collect the pre-test and hand out the Verifiable Training Record Form (VTRF)
- Distribute and review the training materials on Scale Insects
- Use the Training outline as a guide for key points.
    - Encourage active participation from all Team Members
    - Ask probing questions to develop key points
    - Encourage group reading
- After reading and reviewing all materials, ask questions to verify the lesson has been understood.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University

WEEKLY TRAINING SESSION

Scale Insects

Name _____ Date _____

PRE & POST TEST

1. T or F Scales are piercing-sucking insects that live under a wax covering.

2. Scales are classified as armored or soft scales depending on _____.
   a. Their mouthpart type
   b. How big they are
   c. Whether or not their wax covering is attached to their body.
   d. How hard they are to kill.

3. Scales feed on _____.
   a. The top sides of the leaves
   b. The bottom sides of the leaves
   c. The twigs and branches
   d. All of the above depending on the type of scale.

4. T or F The wax covering of an armored scale is attached to its body.

5. T or F Sooty mold is not found associated with armored scales.

6. Adult male scales are _____
   a. Tiny winged gnats
   b. Bigger than the females
   c. Smaller than the females
   d. About the same size as the females

7. Adult female scales are _____.
   a. Wingless and remain under the wax covering
   b. Known as crawlers
   c. Smaller than the males
   d. Always red

8. The best treatment for Armored Scales is _____.
   a. Horticultural Oil
   b. Safari
   c. Imidacloprid
   d. Bifenthrin

WEEKLY TRAINING SESSION

Scale Insects

PRE & POST TEST ANSWER KEY

1. T or F Scales are piercing-sucking insects that live under a wax covering.

2. Scales are classified as armored or soft scales depending on _____.
   a. Their mouthpart type
   b. How big they are
   c. Whether or not their wax covering is attached to their body.
   d. How hard they are to kill.

3. Scales feed on _____.
   a. The top sides of the leaves
   b. The bottom sides of the leaves
   c. The twigs and branches
   d. All of the above depending on the type of scale.

4. T or F The wax covering of an armored scale is attached to its body.

5. T or F Sooty mold is not found associated with armored scales.

6. Adult male scales are _____
   a. Tiny winged gnats
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   a. Wingless and remain under the wax covering
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9. The best treatment for Armored Scales is _____.
   a. Horticultural Oil
   b. Safari
   c. Imidacloprid
   d. Bifenthrin

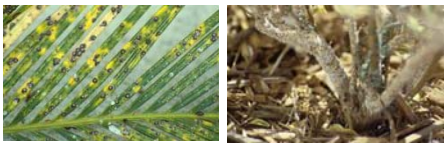
Shrub Damaging Insects

Scales

Scales

- Scales are piercing-sucking insects that live under a wax covering.
- They are classified as armored scales or soft scales depending on whether or not the covering is attached to the insect.
- Depending on the type of scale, they may feed on the top or bottom sides of the leaves or on the twigs and branches.
- They are stationary most of their life.





Typical Scale Lifecycle

- Adult male scales are tiny winged gnats.
- Adult female scales are wingless and remain under the wax covering.
- Eggs are laid under the wax covering.
- Young nymphs, known as crawlers, emerge from under the wax covering.
- They move across the plant until finding a spot to feed.
- They insert their piercing-sucking mouthparts and remain stationary until adult.
- The wax covering is made with a combination of wax and honeydew.



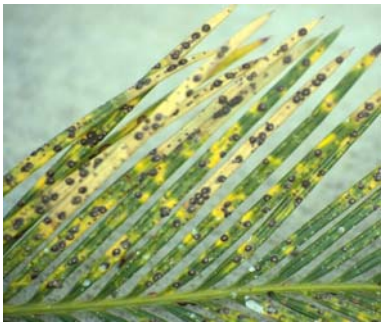
Armored Scales

- The wax covering of an Armored Scale is not attached to its body.
  - If you pry up the wax covering, the insect can be found underneath.
  - Sooty mold is not found with armored scales.



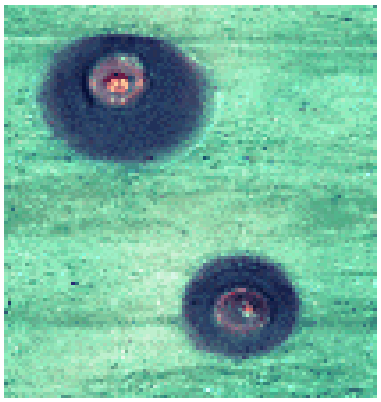
Florida Red Scale

- Florida Red Scale is an armored scale.
- It is commonly found on Sagos, Podocarpus and Holly.
- They can be found primarily on the top sides of the leaves, but may also be found on the bottom sides.



Florida Red Scale

- Florida Red Scale is dark reddish-brown to black with a lighter colored elevated tip in the middle.
- Its size ranges from about 1/20th to 1/8th of an inch



False Oleander Scale

- False Oleander Scale is an armored scale.
- It is commonly found on Magnolia, Oleander, Elaeagnus (Silverthorn).
- It is typically found on the top sides of the leaves.



False Oleander Scale

- False Oleander Scale is tear dropped shaped, white with a brown area on the front.
- Its size ranges from 1/20th to 1/6th of an inch.



Asian Cycad Scale

- Asian Cycad Scale is an armored scale that looks very similar to Tea Scale or False Oleander Scale.
- Asian Cycad Scale was introduced into Miami in 1992 and quickly made its way throughout Florida.



Asian Cycad Scale

- This scale is very aggressive and will quickly and completely cover the fronds and trunk.



Asian Cycad Scale

- Preventative treatment must occur with every regular service by drenching all sagos with our insect and disease slurry.
- The leaves, trunk and root system must be thoroughly drenched.



Asian Cycad Scale

- Treatment for existing problems must be very aggressive using our Insect and Disease Slurry, which contains Imidacloprid (Zenith).
- Horticultural Oil should be added to improve control.
- In severe cases, Safari should be used.



Asian Cycad Scale

- The leaves, trunk and root system must be thoroughly drenched.
- Follow up every 14 days until control has been achieved.
- Control will be more easily achieved if the affected/damaged leaves can be removed.



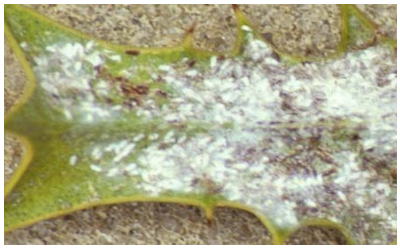
Tea Scale

- Tea Scale is an armored scale.
- It is commonly found on Holly, Camellias and Ilex Shilling.
- They are typically found on the bottom sides of the leaves usually on the lower growth or against a wall or other shady area.



Tea Scale

- Tea Scale is very small, about 1/30th of an inch.
- They are elongate in shape.
- The males are white and the females are brown.
- White web-like filaments can be seen in heavy infestations.



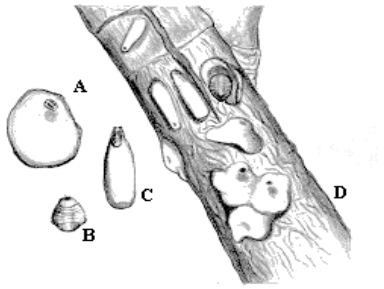
Peach Scale

- Peach Scale is an armored scale.
- It is commonly found on Sinense Ligustrum, Chinaberry, Peach trees and Hibiscus.
- It is typically found on the woody portions of the plant.



Peach Scale

- Peach scale are very small, about 1/25th of an inch.
- They are, round to elongate, white to off white with a small yellow to reddish spot at one end.



White peach scale. A, Female armor. B, Female. C, Male armor. D, Damage.

Soft Scales

- The wax covering of a soft scale is attached to its body.
  - If you pry up the wax covering of a soft scale, the insect will be attached to the wax covering.
  - Sooty mold will be found growing on the honeydew excretions of the soft scales.



Florida Wax Scale

- Florida Wax Scale is a soft scale.
- It can be found on Holly, Hawthorn and Jasmine.
- They are typically found on the top sides of the leaves but may also be found on the young stems.



Florida Wax Scale

- Florida Wax Scale range in size from 1/20th to 1/8th of an inch.
- They are white to pinkish-white, round to slightly oblong.
- The eggs are red and can be seen under the female when the wax covering is lifted.



Other Wax Scales

- There are many other wax scales…
  - Indian Wax Scale
  - Chinese Wax Scale
  - Japanese Wax Scale
  - Barnacle Scale
- Most are white to off white and globular in shape.



Cottony Cushion Scale

- Cottony Cushion Scale is a soft scale.
- It can be found on Pittosporum and many others.
- They are typically found under the leaves and on young stems.



Cottony Cushion Scale

- Cottony Cushion Scale Range from 1/20th to over 1/4th of an inch.
- The crawlers are 1/20th of an inch and red with dark legs, antennae and long hairs at the end of their body. They will crawl about the plant until the egg sack is formed.
- The mature females have a large fluted egg sack.
- About 600 to 800 eggs are laid in the sack.





Hemispherical Scale

- Hemispherical Scale is a soft scale.
- It can be found on Sagos, ferns, palms, citrus and others.
- They are found on the front and back sides of the leaves as well as the young branches.



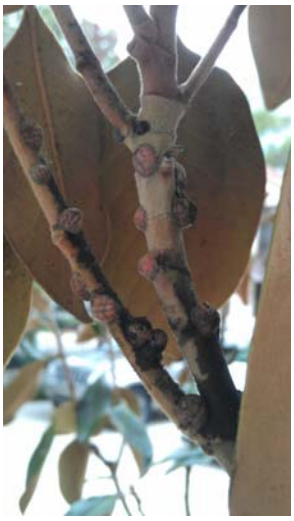
Hemispherical Scale

- Hemispherical Scale vary in size depending on the host plant species.
- The young are yellowish and semi-transparent.
- The adult female is dark brown and resemble a helmet in shape.



Tuliptree Scale

- Tuliptree Scale is one of the largest soft scales in the U.S.
- Mature females grow to over 1/4th inch in diameter.
- The waxy covering of a mature female varies from light grayish green to pinkish orange mottled with black.
- Hosts - Magnolia, Yellow Poplar and Tuliptrees



Tuliptree Scale

- This pest overwinters as second instar nymphs and resumes feeding in early spring.
- Males emerge from the waxy scale covering as small, two winged individuals. They mate with females, and then die.
- By summer, mature females give birth to first instar nymphs (crawlers). Each female may produce as many as 3,000 crawlers over several weeks.
- Once the crawlers find a favorable site, they insert their piercing-sucking mouthparts into the vascular system of the tree and begin to feed.



Scale Insect Control

- Our regular shrub care treatments utilizes Imidacloprid (Zenith), which is excellent for controlling most shrub damaging insects, including scales.
- Imidacloprid is a systemic insecticide, which means that it will enter into the plant through the leaves and the roots and kill the insects when they feed on the plant.
- Horticultural oil can be added to optimize the results when scale populations are particularly high.
- Safari will provide better results when dealing with armored scales.
- Scale insects can be very difficult to control and will usually require a 2 week follow-up.



Scale Insect Control

- Mid-sized trees can be treated by way of Imidacloprid drench to the root system.
  - See the Mid-sized Tree Root Drench Protocol
- Larger trees can be treated by way of direct injection using Imi-jet.

Scale Insect Control

- It is very important to be able to identify scale insects when performing shrub inspections.
- It is not necessary to know the name of the scale.
- If you know it is a scale insect, but you do not know its name, simply identify it as a scale.
- You know it is an insect.
- You know it causes damage to the plant.
- You know it needs to be killed.
- Our service is the solution.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Topic Category: Shrub Care

Recordable Verifiable Training Hours: 1.0 to 1.5 hours

Objectives:

- Read and discuss our Shrub Care Protocol.
- Ensure proper understanding by all Specialist
- To **calibrate every Specialist for granular shrub fertilizer applications.**
- **To ensure that every Specialist can perform the proper technique for liquid shrub care applications.**

This meeting will qualify for 1 hour of Department of Ag ID Cardholder Training. Make sure you fill out the Department of Ag ID Cardholder Training form for each Team Member. Keep a copy in the Team Members training file at your office.

Length of lesson: 60 to 90 minutes.

Materials needed:

- Training Guideline (Below)
- Training Document Shrub Care Applications – Granular and Liquid (GreenUp Protocols\Individual Protocols\Lawn Care Basic Application)
- 12-2-14 or 12-0-14 Shrub Fertilizer
- 64 ounce and 32 ounce measuring cup (clean and dry)
- Scale to weigh from 1 to 4 pounds.
- 2 pieces of cardboard from fertilizer pallets to demonstrate applying a handful of fertilizer to 25 sq. ft.
- Pre- and Post- tests.

Training Guidelines:

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- Hand out the Verifiable Training Record Form (VTRF)
- Begin the meeting by defining the training topic and handing out the Pre-test
- Distribute and review the training materials on Shrub Care Application Procedures
    - Allow the Team Members to complete the Pre-test as the application information is discussed.
- Use the Training outline as a guide for key points.
    - Encourage active participation from all Team Members
    - Ask probing questions to discuss key points.
    - Read and answer questions from the test and have the Specialists write in their answers.
    - Encourage group reading
- After reading and reviewing all materials, ask questions to verify the lesson has been understood.
    - Collect the pre-test and discard.
- Thoroughly review and discuss our Shrub Care Protocol.
- **Begin the demonstration portion of the training**
- Show the points of reference for the shrub fertilizer from the protocol.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

- Show 56 ounces of shrub fertilizer in a measuring cup and let them know that this weighs 4 pounds.
- Show that 14 ounces in a measuring cup weighs one pound.
- Explain that one good sized handful (with gloves on) of shrub fertilizer weights about 3 ounces
- Take 4 good sized handfuls of shrub fertilizer (with gloves on) as if you were fertilizing shrubs and put the 4 handfuls into a container such as a 5 gallon bucket. Transfer the material into a measuring cup. The amount of fertilizer in the 4 handfuls should look like 10.5 ounces in a measuring cup, which should weigh roughly 12 ounces or 0.75 pounds.
- Take 2 pieces of cardboard from fertilizer pallets and place them on a concrete surface. Explain that this area is roughly 25 square feet. Have each Specialist take a good size handful of shrub fertilizer and scatter it evenly throughout the 25 square foot area as if making a shrub fertilizer application.

- Demonstrate how shrub spray is properly applied to shrubs around the office.
  - Show the proper technique to get leaf movement using the "figure 8" pattern and spraying from the ground up.
  - Show how to spray plants against a building by treating behind the plants next to the building and spraying outwards. Explain why the backsides of the leaves would be properly treated using this technique.
  - Have all Specialists perform this application with everyone watching and critiquing.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Name _____ Date _____

PRE & POST TEST

1. T or F Certain shrubs are treated preventatively at the time of every initial or regular service.
2. T or F All shrubs are treated preventatively at the time of every regular service.
3. T or F Sagos are sprayed and drenched at the time of every initial or regular service for the prevention or control of Asian Cycad Scale.
4. T or F Imidacloprid controls spider mites and caterpillars.
5. T or F Crape Myrtles that are too tall to spray are drenched at the time of every initial and regular service from spring through fall.
6. T or F Spraying shrubs in a "figure 8" pattern helps to ensure contact to the backsides of the leaves.
7. T or F It is imperative to use proper spray techniques to ensure contact of the new growth and backsides of the leaves and also to keep shrub spray materials from contacting window and the structure.
8. T or F Particular attention must be given to ensure that shrub spray drift does not contact people passing by or neighbors who may be in their lawns at the time of our treatment.
9. T or F One pound of shrub fertilizer looks like 14 ounces in a measuring cup.
10. At the equivalent rate of 8 pounds per 1000 sq. ft., 1 pound of shrub fertilizer would cover _____ sq. ft.
    a. 50
    b. 100
    c. 125
    d. 150
11. One good sized handful of fertilizer should cover about _____ sq. ft. at the equivalent rate of 8 pounds per 1000 sq. ft.
    a. 25
    b. 50
    c. 75
    d. 100

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

12. T or F I have been successfully calibrated to perform shrub fertilizer applications and have demonstrated my ability to perform shrub spray applications.

13. T or F When bees are present or when the shrubs are in full bloom, preventative applications are not performed, but soil drench methods can be utilized when shrub damaging insects or diseases are present.

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

Answer Sheet

1. T or F Certain shrubs are treated preventatively at the time of every initial or regular service.
2. T or F All shrubs are treated preventatively at the time of every regular service.
3. T or F Sagos are sprayed and drenched at the time of every initial or regular service for the prevention or control of Asian Cycad Scale.
4. T or F Imidacloprid controls spider mites and caterpillars.
5. T or F Crape Myrtles that are too tall to spray are drenched at the time of every initial and regular service from spring through fall.
6. T or F Spraying shrubs in a "figure 8" pattern helps to ensure contact to the backsides of the leaves.
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    a. 50
    b. 100
    c. 125
    d. 150
11. One good sized handful of fertilizer should cover about _____ sq. ft. at the equivalent rate of 8 pounds per 1000 sq. ft.
    a. 25
    b. 50
    c. 75
    d. 100

WEEKLY TRAINING SESSION

Shrub Care Protocol and Granular Shrub Fertilizer Calibration

12. T or F I have been successfully calibrated to perform shrub fertilizer applications and have demonstrated my ability to perform shrub spray applications. The correct answer will be true if you performed the training properly.

13. T or F When bees are present or when the shrubs are in full bloom, preventative applications are not performed, but soil drench methods can be utilized when shrub damaging insects or diseases are present.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

Objective

Our Shrub Care Service is based on the principles of Integrated Pest Management and with great consideration of the 5 Key Principles.

Liquid Shrub Care Application Protocol

Shrub pest treatments are performed when plants either have a current pest issue (curative) or preventatively when particular plants are known to be susceptible to particular insect or disease issues. Shrubs that are treated on a preventative basis with every initial and regular service include:

- Azalea
- Crape myrtle
- Camellia
- Gardenia
- Sago
- Pittosporum
- Indian Hawthorne
- Holly
- Knock-Out Roses

The list above may be expanded (not reduced) depending on the geographical location and specific concerns in the Service Center.

This service is performed using a pump and droptank system from the Lawn Care vehicle. The products used will vary depending on the time of year and the most prevalent insect or disease problems.

In the cooler times of the year, Horticultural Oil is used for the insecticide and Kalmor is used for the fungicide. Horticultural oil is a mineral oil. It controls insects and mites through suffocation and by breaking down their exoskeleton. Horticultural oil is not systemic. It controls on contract only, so a thorough application of the front and backsides of the leaves is very important. Kalmor is a copper-based fungicide/bactericide. It is also not systemic. There are a few bacterial diseases that are prevalent during the cooler spring months as well as downy mildew, which are well controlled by copper-based materials.

Tristar is used as the insecticide in the later spring months (Florida and Louisiana).

Through the summer months, our I&D Slurry is used. The slurry contains Imidacloprid, Armada or Transom and wetting agent. Imidacloprid will do an excellent job on insects such as aphids, lace bugs, thrips, soft scale and mealybugs. It is important to recognize that Imidacloprid does not control caterpillars or spider mites. Armada and Transom do a good job on a wide variety of fungal disease issues. They do not control Pythium, phytophthora or Downy Mildew. There are many times when specific pest control materials will be needed to control specific pests. Use them according to label directions for the specific insect or disease problem. In these cases, the plants needing treatment are typically very limited; a backpack sprayer should be used.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

All Sagos are sprayed and drenched to prevent Asian Cycad Scale. From spring through fall, Crape myrtles that are too tall to spray are drenched to prevent aphids. The shrub gun can be used for this purpose; adjust the gun to course spray and treat the trunk ground in the root zone area until puddling occurs.

For the protection of pollinating insects, do not spray the foliage of shrubs that are in full bloom or if pollinators are in the area. If insect problems exist or if preventive insect applications are necessary and pollinators are in the area, perform a drench of the root system with the I&D mixture rather than spraying the foliage.

Equipment

When performing liquid treatments using the lawn care vehicle, a shrub gun is utilized. The shrub gun has a nozzle that can be adjusted to spray a pin-stream to wide cone pattern. When performing liquid applications from a backpack applicator, either an 8010E or adjustable cone style tip is used.

Technique

With either piece of equipment, the Specialist must use techniques that achieve coverage of the front side and back sides of all leaves including new growth. Properly using the shrub gun will include almost continual adjustment of the gun to create "leaf movement". As you move through the landscape you should be adjusting the nozzle to change the spray pattern according to thickness and hardiness of the plant and to allow pressure to fold back leaves to allow material to thoroughly coat both sides of the leaves without doing damage to ornamental. Treating with a “Figure 8” pattern is beneficial to get the spray pattern to swirl and move the leaves so the backsides can be reached.

- Covering the backsides of the leaves requires the most effort and skill. This can be achieved by spraying from behind the plant when it is against a structure, by starting from ground level and spraying upwards or by spraying from the side of the plant and moving the leaves so the backs of the leaves are seen.
- Treating the new growth must also be a conscious effort if the shrubbery is not well pruned. Keep in mind that aphids will primarily feed on the new growth.
- Treating the front sides of the leaves may be achieved when treating the backsides of the leaves; however, additional treatment may be needed to get complete coverage.
- Movement of the spray pattern should be at a pace to wet the leaves, but not so slow that they are dripping excessively. When you look at the shrub after treatment, all the leaves should be wet and dripping slightly.

It may also be beneficial to drench the root system of the plant with systemic materials. Drenching the root system with systemic materials is beneficial to get more of the control materials inside the plant and will achieve a more thorough and longer lasting control. The shrub gun will work for this application; however, a lawn wand may be beneficial for drenching larger areas in a more time efficient manner. Shrub guns will typically apply roughly 2 gallons a minute; the lawn wand can apply up to 5 gallons per minute. When drenching just one or two plants, a 2.5 gallon jug can be mixed and utilized.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS



Figure 1



Figure 2

In Figure 1, the Specialist has positioned himself against the structure and spraying away from the building to keep the material off the structure and windows. He is also spraying upwards from ground level to ensure coverage of the backsides of the leaves.
In Figure 2, the Specialist is drenching the ground below using the shrub gun.

Safety and Liability

It is important to be consciously aware that the mist from a liquid application can move away from the target if not careful; particularly on windy days. Particular attention must be paid to ensure that the spray does not contact people passing by or neighbors who may be in their lawns while the application is being performed. Also be careful to ensure that the spray does not contact the customer's window, patio furniture or other non-target surfaces that could be stained or damaged. If this does occur, wash the windows or other surfaces with clean water before the material has a chance to dry.
It is also important to be on the lookout for nesting birds, pollinators or large quantities of beneficial insects. If treatment is required in these situations, utilize the drench method rather than the spray method. If treatment is not required, do not treat.

Do not allow pesticides of any kind to contact bodies of water or fish ponds. Many of the materials we use can be deadly to fish.

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS

Granular Fertilizer Applications

Nutritional applications are performed seasonally as prescribed by our Agronomic Program or when nutritional issues arise. This application is typically performed by hand and typical application rates range from 6 to 8 pounds per 1000 sq. ft. depending on the season. Placement of the fertilizer should be evenly from the trunk to a few feet past the dripline. The dripline of the shrub or tree is the outer edge of the canopy. The roots of an established tree or shrub reach well beyond the dripline.

Points of reference:
1 pound of fertilizer by weight looks like 14 ounces in a measuring cup.
4 pounds of fertilizer by weight looks like 56 ounces in a measuring cup.



4 pounds of fertilizer

A good size hand full of fertilizer (wearing gloves) weighs about 3 ounces by weight. To confirm this without an accurate scale, take 4 good sized handfuls of shrub fertilizer as if you were fertilizing shrubs and put the 4 handfuls into a container such as a 5 gallon bucket. Transfer the material into a measuring cup. The amount of fertilizer in the 4 handfuls should look like 10.5 ounces in a measuring cup, which should weigh roughly 12 ounces or 0.75 pounds.

One good sized handful of shrub fertilizer weighs about 3 ounces (or 0.1875 pounds). This amount of fertilizer covers roughly 25 sq. ft. when the rate is 8 pounds per 1000 sq. ft. If the rate is 6 pounds per 1000 sq. ft., a 3 ounce handful should cover roughly 30 sq. ft.

MASSEY GreenUP Landscape Services

GREENUP SERVICE PROTOCOLS

SHRUB CARE APPLICATIONS



The shrub bed pictured above is roughly 25 square feet (3 feet wide x 8.33 feet long). The three azaleas picture above could be fertilized with one good sized handful of fertilizer. This amount of fertilizer would be spread evenly throughout this area to achieve a proper application. Fertilizer should never be left as clumps or visible piles.

When fertilizing small trees and larger shrubs, the same rate per square foot is used, but due to the larger area being fertilized, more fertilizer per plant will be applied.
Keep in mind that applying 8 pounds of our 12-2-14 or 12-0-14 fertilizer per 1000 sq. ft. applies 0.96 pounds of nitrogen per 1000 sq. ft. 1 pound of nitrogen per 1000 sq. ft. is the maximum allowable rate per application as per Florida Department of Agriculture Rule. If a shrub or tree is particularly nutritionally deficient, more frequent applications is preferred rather than heavier applications. Additionally, the plant is better able to assimilate the nutrients applied.

Sagos and palms are fertilized with our 8-2-12 or 8-0-12 at a rate of 12 pounds per 1000 sq. ft.

Any fertilizer debris on impervious surfaces must be removed with the power blower immediately after treatment to avoid staining surfaces and to comply with the Green Industries Best Management Practices. Do not allow any fertilizer to get into a body of water or fish pond.

WEEKLY TRAINING SESSION

Scale Insects

Topic Category: Lawn

Recordable Verifiable Training Hours: 1.0

Objectives: This lesson is designed to teach Scale Insects – Life cycle and Identification.

Length of lesson: Approx 60 minutes.

Materials needed:

- Training Guideline
- Training Document - Shrub Damaging Insects - Scales
- Collect samples of Scale Insects from the field, if available.
- Pre- and Post- tests.

Training Guidelines:

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- Begin the meeting by defining the training topic and handing out the Pre-test
    - Allow a few minutes for Team Members to complete the Pre-test.
    - Collect the pre-test and hand out the Verifiable Training Record Form (VTRF)
- Distribute and review the training materials on Scale Insects
- Use the Training outline as a guide for key points.
    - Encourage active participation from all Team Members
    - Ask probing questions to develop key points
    - Encourage group reading
- After reading and reviewing all materials, ask questions to verify the lesson has been understood.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University

WEEKLY TRAINING SESSION

Scale Insects

Name _____ Date _____

PRE & POST TEST

1. T or F Scales are piercing-sucking insects that live under a wax covering.

2. Scales are classified as armored or soft scales depending on _____.
   a. Their mouthpart type
   b. How big they are
   c. Whether or not their wax covering is attached to their body.
   d. How hard they are to kill.

3. Scales feed on _____.
   a. The top sides of the leaves
   b. The bottom sides of the leaves
   c. The twigs and branches
   d. All of the above depending on the type of scale.

4. T or F The wax covering of an armored scale is attached to its body.

5. T or F Sooty mold is not found associated with armored scales.

6. Adult male scales are _____
   a. Tiny winged gnats
   b. Bigger than the females
   c. Smaller than the females
   d. About the same size as the females

7. Adult female scales are _____.
   a. Wingless and remain under the wax covering
   b. Known as crawlers
   c. Smaller than the males
   d. Always red

8. The best treatment for Armored Scales is _____.
   a. Horticultural Oil
   b. Safari
   c. Imidacloprid
   d. Bifenthrin

WEEKLY TRAINING SESSION

Scale Insects

PRE & POST TEST ANSWER KEY

1. T or F Scales are piercing-sucking insects that live under a wax covering.

2. Scales are classified as armored or soft scales depending on _____.
   a. Their mouthpart type
   b. How big they are
   c. Whether or not their wax covering is attached to their body.
   d. How hard they are to kill.

3. Scales feed on _____.
   a. The top sides of the leaves
   b. The bottom sides of the leaves
   c. The twigs and branches
   d. All of the above depending on the type of scale.

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   d. Always red

9. The best treatment for Armored Scales is _____.
   a. Horticultural Oil
   b. Safari
   c. Imidacloprid
   d. Bifenthrin

Shrub Damaging Insects

Scales

Scales

- Scales are piercing-sucking insects that live under a wax covering.
- They are classified as armored scales or soft scales depending on whether or not the covering is attached to the insect.
- Depending on the type of scale, they may feed on the top or bottom sides of the leaves or on the twigs and branches.
- They are stationary most of their life.



Typical Scale Lifecycle

- Adult male scales are tiny winged gnats.
- Adult female scales are wingless and remain under the wax covering.
- Eggs are laid under the wax covering.
- Young nymphs, known as crawlers, emerge from under the wax covering.
- They move across the plant until finding a spot to feed.
- They insert their piercing-sucking mouthparts and remain stationary until adult.
- The wax covering is made with a combination of wax and honeydew.



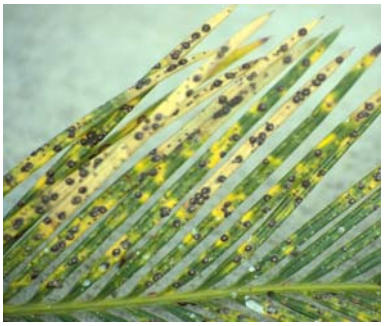
Armored Scales

- The wax covering of an Armored Scale is not attached to its body.
  - If you pry up the wax covering, the insect can be found underneath.
  - Sooty mold is not found with armored scales.



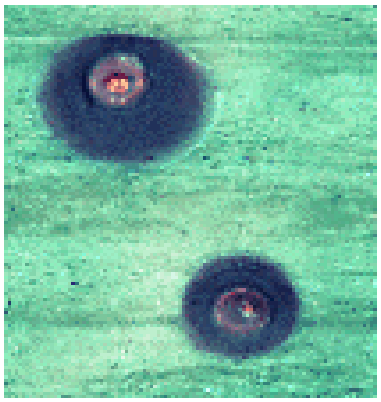
Florida Red Scale

- Florida Red Scale is an armored scale.
- It is commonly found on Sagos, Podocarpus and Holly.
- They can be found primarily on the top sides of the leaves, but may also be found on the bottom sides.



Florida Red Scale

- Florida Red Scale is dark reddish-brown to black with a lighter colored elevated tip in the middle.
- Its size ranges from about 1/20th to 1/8th of an inch



False Oleander Scale

- False Oleander Scale is an armored scale.
- It is commonly found on Magnolia, Oleander, Elaeagnus (Silverthorn).
- It is typically found on the top sides of the leaves.



False Oleander Scale

- False Oleander Scale is tear dropped shaped, white with a brown area on the front.
- Its size ranges from 1/20th to 1/6th of an inch.



Asian Cycad Scale

- Asian Cycad Scale is an armored scale that looks very similar to Tea Scale or False Oleander Scale.
- Asian Cycad Scale was introduced into Miami in 1992 and quickly made its way throughout Florida.



Asian Cycad Scale

- This scale is very aggressive and will quickly and completely cover the fronds and trunk.



Asian Cycad Scale

- Preventative treatment must occur with every regular service by drenching all sagos with our insect and disease slurry.
- The leaves, trunk and root system must be thoroughly drenched.



Asian Cycad Scale

- Treatment for existing problems must be very aggressive using our Insect and Disease Slurry, which contains Imidacloprid (Zenith).
- Horticultural Oil should be added to improve control.
- In severe cases, Safari should be used.



Asian Cycad Scale

- The leaves, trunk and root system must be thoroughly drenched.
- Follow up every 14 days until control has been achieved.
- Control will be more easily achieved if the affected/damaged leaves can be removed.



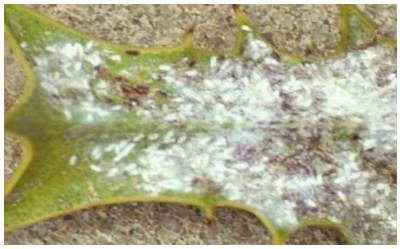
Tea Scale

- Tea Scale is an armored scale.
- It is commonly found on Holly, Camellias and Ilex Shilling.
- They are typically found on the bottom sides of the leaves usually on the lower growth or against a wall or other shady area.



Tea Scale

- Tea Scale is very small, about 1/30th of an inch.
- They are elongate in shape.
- The males are white and the females are brown.
- White web-like filaments can be seen in heavy infestations.



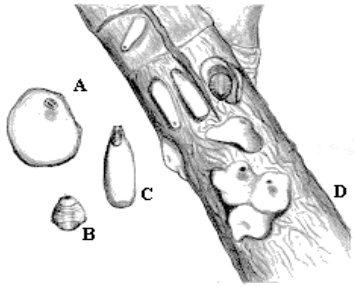
Peach Scale

- Peach Scale is an armored scale.
- It is commonly found on Sinense Ligustrum, Chinaberry, Peach trees and Hibiscus.
- It is typically found on the woody portions of the plant.



Peach Scale

- Peach scale are very small, about 1/25th of an inch.
- They are, round to elongate, white to off white with a small yellow to reddish spot at one end.



White peach scale. A, Female armor. B, Female. C, Male armor. D, Damage.

Soft Scales

- The wax covering of a soft scale is attached to its body.
  - If you pry up the wax covering of a soft scale, the insect will be attached to the wax covering.
  - Sooty mold will be found growing on the honeydew excretions of the soft scales.



Florida Wax Scale

- Florida Wax Scale is a soft scale.
- It can be found on Holly, Hawthorn and Jasmine.
- They are typically found on the top sides of the leaves but may also be found on the young stems.



Florida Wax Scale

- Florida Wax Scale range in size from 1/20th to 1/8th of an inch.
- They are white to pinkish-white, round to slightly oblong.
- The eggs are red and can be seen under the female when the wax covering is lifted.



Other Wax Scales

- There are many other wax scales…
  - Indian Wax Scale
  - Chinese Wax Scale
  - Japanese Wax Scale
  - Barnacle Scale
- Most are white to off white and globular in shape.



Cottony Cushion Scale

- Cottony Cushion Scale is a soft scale.
- It can be found on Pittosporum and many others.
- They are typically found under the leaves and on young stems.



Cottony Cushion Scale

- Cottony Cushion Scale Range from 1/20th to over 1/4th of an inch.
- The crawlers are 1/20th of an inch and red with dark legs, antennae and long hairs at the end of their body. They will crawl about the plant until the egg sack is formed.
- The mature females have a large fluted egg sack.
- About 600 to 800 eggs are laid in the sack.





Hemispherical Scale

- Hemispherical Scale is a soft scale.
- It can be found on Sagos, ferns, palms, citrus and others.
- They are found on the front and back sides of the leaves as well as the young branches.



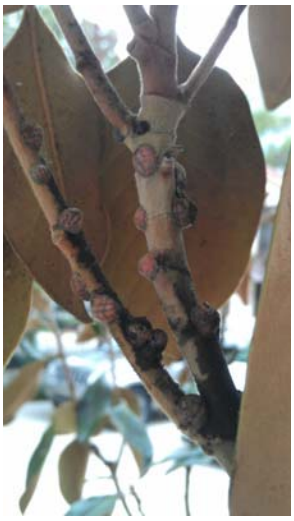
Hemispherical Scale

- Hemispherical Scale vary in size depending on the host plant species.
- The young are yellowish and semi-transparent.
- The adult female is dark brown and resemble a helmet in shape.



Tuliptree Scale

- Tuliptree Scale is one of the largest soft scales in the U.S.
- Mature females grow to over 1/4th inch in diameter.
- The waxy covering of a mature female varies from light grayish green to pinkish orange mottled with black.
- Hosts - Magnolia, Yellow Poplar and Tuliptrees



Tuliptree Scale

- This pest overwinters as second instar nymphs and resumes feeding in early spring.
- Males emerge from the waxy scale covering as small, two winged individuals. They mate with females, and then die.
- By summer, mature females give birth to first instar nymphs (crawlers). Each female may produce as many as 3,000 crawlers over several weeks.
- Once the crawlers find a favorable site, they insert their piercing-sucking mouthparts into the vascular system of the tree and begin to feed.



Scale Insect Control

- Our regular shrub care treatments utilizes Imidacloprid (Zenith), which is excellent for controlling most shrub damaging insects, including scales.
- Imidacloprid is a systemic insecticide, which means that it will enter into the plant through the leaves and the roots and kill the insects when they feed on the plant.
- Horticultural oil can be added to optimize the results when scale populations are particularly high.
- Safari will provide better results when dealing with armored scales.
- Scale insects can be very difficult to control and will usually require a 2 week follow-up.



Scale Insect Control

- Mid-sized trees can be treated by way of Imidacloprid drench to the root system.
  - See the Mid-sized Tree Root Drench Protocol
- Larger trees can be treated by way of direct injection using Imi-jet.

Scale Insect Control

- It is very important to be able to identify scale insects when performing shrub inspections.
- It is not necessary to know the name of the scale.
- If you know it is a scale insect, but you do not know its name, simply identify it as a scale.
- You know it is an insect.
- You know it causes damage to the plant.
- You know it needs to be killed.
- Our service is the solution.

FL/LA

WEEKLY TRAINING SESSION

Steps of Irrigation Service Part 1

21 Steps of Irrigation Service Part 1:

STEP 1 Record Irrigation Water Meter Reading

FREQUENCY – Every Service

- Only for dedicated irrigation meter
  - Some reclaimed water systems have meters
- Information critical to document the results of our work for diagnosing water use issues



STEP 2 Measure Water Source Pressure

FREQUENCY – 2x per Year

- Looking for changes in pressure
  - If the pressure measured during the day is not adequate, the pressure MUST be checked when system is programmed to operate automatically
  - Refer to *Flow & Pressure Guidelines* sheet
- **Static Pressure** if measured at the backflow or house hose bib
- **Dynamic Pressure** if measured at the pump discharge



STEP 3 Observe Mainline Filtration

FREQUENCY – Every Service

- Skip if no filter present
- Look for
  - Leaks
  - Damage
  - A drop in sprinkler operating pressure



STEP 4 Observe Backflow or Pump

FREQUENCY – Every Service

- Looking for the obvious
  - Functioning
  - Damage
  - Changes or alterations that we have not done



STEP 5 Inspect Controller /Relay



FREQUENCY – Every Service

- Condition
  - Display problems
  - Fault/error messages/icons
  - Insects
  - Internal damage/burn marks
  - External damage
  - Loose or broken fittings
- Changes to the controller, relay, wiring, or splices that we did not make

STEP 6 Confirm Time and Day Compliance

FREQUENCY – Every Service

- Know local ordinances for the controller programming
  - Allowable hours of operation
    - Most of FL is 10 pm to 9 am
  - Allowable days of operation
    - Most of FL is 2 days per week in daylight savings time, and 1 day per week the rest of the year
- Always check with local water utility

FL/LA

WEEKLY TRAINING SESSION

Steps of Irrigation Service Part 1

STEP 7 Adjust Time of Day for Time Changes

FREQUENCY – 2x per Year

- Confirm the time of day is correct for the standard or daylight-savings time
- For mechanical controllers, adjust the hour wheel as necessary
  - Motors speed up and slow down with voltage changes



STEP 8 Inspect Controller Programming

FREQUENCY – Every Service

- Is the current program the correct one?
  - Number of programs with start times
  - Number of start times per program
  - Station run times associated with each start time
- Is the "grow in" or "establishment" programming still needed

STEP 9 Test Controller Battery (if equipped)

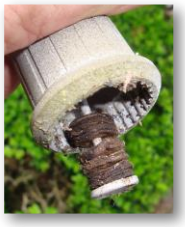
FREQUENCY – 2x per Year

- Many controllers out there with battery back-up
  - Hunter Pro C, Rain Bird ESP, and others DO NOT use 9v battery to hold program or time
    - Used for programming without AC power only
- Use Volts DC setting on multimeter
- Conduct test 2 times per year at time of day change

STEP 10 Test Rain Sensor

FREQUENCY – 2x per Year

- Inspect the disc stack
  - If the sensor is OVER 3 years old, recommend the disk stack be replaced
- DO NOT use the hose to wet the sensor
  - It will keep the controller off for up to 48 hours



STEP 11 Test Operation of All Zone Valves

FREQUENCY – Every Service

- As solenoid valve is operated, look for
  - Valves not turning on
  - Valves not shutting off
  - Valves weeping after turning off
- As indexing valve is operated, look for
  - Valve not advancing
  - Valve skipping zone

STEP 12 Identify Valve and Valve Box Condition Issues





FREQUENCY – Every Service

- All boxes to have proper-fitting covers
- Open valve box and look for leaks
  - Look for leaks at top of indexing valve