

June Risk Management VTM

Left Turns at Intersections: Clear the Path. Prevent the Crash.

Training Goals & Learning Objectives

By the end of this training, team members and managers will be able to:

- Understand the risks associated with making left turns
- Identify common mistakes when turning at intersections
- Recognize how improper checks lead to preventable collisions
- Understand company expectations for safe turning practices

Why This Matters for Us

Recent accident investigations show a high number of preventable collisions occur during left turns at intersections. Drivers often assume the path is clear or misjudge the speed of oncoming traffic. These mistakes lead to serious crashes, injuries, and liability exposure.

What Makes Left Turns Risky

Left turns are one of the most dangerous driving maneuvers because they require crossing opposing traffic. Risks increase when drivers:

- Fail to fully stop and assess the intersection
- Misjudge the speed or distance of oncoming vehicles
- Rush to “beat” traffic or a changing light
- Focus only on one lane while ignoring others
- Turn with obstructed visibility (large vehicles, weather, glare)

The Risk of “It Looks Clear”

Many drivers rely on a quick glance instead of a full scan. Traffic conditions can change in seconds, and oncoming vehicles may be traveling faster than expected.

Common misjudgments include:

- Underestimating how quickly a vehicle is approaching
- Not accounting for vehicles in multiple lanes
- Missing motorcycles or smaller vehicles

A turn that seems safe at first glance can quickly become a collision if the driver commits too early.

Proper Left Turn Process

1. Come to a complete stop if required
2. Look left, right, then left again
3. Check all lanes of oncoming traffic

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4. Confirm the path is fully clear
5. Proceed only when there is enough space and time to complete the turn safely

Common Accident Pattern

6. Driver approaches an intersection preparing to turn
7. Driver checks briefly and assumes it is clear
8. Oncoming vehicle approaches faster than expected
9. Driver begins the turn
10. Collision occurs in the intersection

Company Expectations

- Take extra caution when making left turns
- Never rush or “force” a turn in traffic
- Ensure full visibility before proceeding
- Yield to all oncoming traffic
- Wait patiently for a safe and complete gap
- Avoid distractions while approaching intersections

Accountability & Consequences

Internal

- Coaching or retraining
- Disciplinary action
- Employee record documentation
- \$500 payroll deduction if found at fault
- Escalated discipline for repeat behavior

External

- Injury risk to drivers and the public
- Claims and legal exposure
- Increased insurance costs
- Vehicle damage and downtime

Manager & Supervisor Responsibility

Supervisors and managers are responsible for reinforcing safe turning practices, coaching drivers on proper intersection behavior, investigating left-turn incidents thoroughly, and supporting Risk Management determinations.

Discussion Prompts

- What makes left turns more dangerous than right turns?
- What mistakes do drivers commonly make when turning left?

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- Why is it risky to assume a gap is good enough?
- How can you improve your visibility before turning?
- What is the safest choice if you are unsure about a gap?

Key Takeaway

A safe left turn requires patience, awareness, and full confirmation.

If you are turning left:

- Your decision must be certain
- Your path must be clear
- Your timing must be safe

If there is any doubt — don't turn. Wait for a clear and safe opportunity.



WEEKLY TRAINING SESSION

Subcontracted Sales Data Entry Process and New Cancellation Code

Data entry of Subcontracted sales did not clearly identify the service was being completed by an outside vendor, resulting in challenges with ensuring sales compensation is paid accurately. To ensure accurate reporting and compensation for subcontracted sales, updated event names have been added to Service Pro.

Accurate selection of updated event names at the time of data entry is critical to ensure proper reporting and compensation.

Events

For subcontracted irrigation and pest services (including commercial services), utilize the new naming conventions below:

- Comm Pest Initial Service Indirect
- Material Sale Indirect
- Rodent Initial Exclusion Indirect
- Rodent Exclusion Indirect
- Wildlife Trapping Initial Service Indirect
- Wildlife Trapping Indirect
- Wildlife Deterrent Indirect
- Pest Indirect
- Irrigation Initial Service Indirect
- Irrigation Repair Indirect

For subcontracted renovation services, the naming conventions will remain the same. For in-house Renovation services utilize the new naming conventions below:

- In-House Install Annuals
- In-House Install Bed Mulching
- In-House Install Plantings
- In-House Install Sod
- In-House Install Turf Plugs
- In-House Renovation Miscellaneous
- In-House Topdressing

Please note, Fumigations remain unchanged



WEEKLY TRAINING SESSION

Subcontracted Sales Data Entry Process and New Cancellation Code

Compensation Rates

Service Category	Compensation Guideline
Subcontracted Services	5%+ based on tenure
Subcontracted Renovations	5%+ based on tenure
In-House Renovations Completed by Service Center	15%+ based on tenure
Fumigations	15%+ based on tenure

Cancellation Reason Code Update

In addition to adding new naming conventions for subcontracted or in-house renovation services, we have added a new cancellation code to differentiate between lost business coded as sold not started and data entry errors coded as sold not started. The new cancel code, "Sold Not Started Data Entry Error," corrects accounts entered incorrectly.

The changes above will result in accurate payroll reporting, accurate sales reporting, and accurate cancellation reporting providing better visibility into the health of our company.

HISTORY & IDENTIFICATION

The Asian Cockroach, *Blatella asahani* arrived in Florida via imports from Japan and first showed up in the Lakeland area in 1986.



Figure 1 Asian Cockroach

The Asian cockroach (Figure 1) is a member of the same genus as the German cockroach, genus *Blatella*. Since they are related species, *germanica* and *asahani* have similar characteristics. They appear close to identical in size and coloration, but most male Asian roaches tend to have wings that slightly cover the tip of the abdomen while wings of German roach males do not always completely cover the very tip of the abdomen. Also, German roaches cannot fully fly whereas Asian cockroaches are avid fliers and will often fly hundreds of feet across a yard and land on the outside of a home. Where German roaches stay mainly indoors, Asian roaches breed mainly outdoors. Another difference between the two species is that the egg capsules of German roaches stick out from behind the female's wings, but the wings of the Asian roach female usually cover over the entire egg capsule when she carries it.

Life Cycle

Like the German roach, the Asian roach lays a dry egg capsule, but instead of within food indoors, it deposits the ootheca in moist leaf litter or within the thatch of lawn or weeds. Female Asian cockroaches have a lifetime reproductive potential for producing approximately four egg capsules (oothecae), each averaging 37 eggs. Immature nymphs take approximately 67 days to reach adulthood. Adult females then live an average of 104 days and adult males live an average of 49 days. Adult females produce their first egg capsule 13 days after adult eclosion, and can drop another 20 days later. Adults are abundant February through May and again August through September. Nymphs predominate May through August. The Asian roach spends the daylight hours buried in mulch or the thatch in a lawn. As the sun sets, they crawl up on the tips of foliage. They then will fly (250' would not be outside of their ability in one flight) toward lights or the light side of a building. This can be unfortunate for people trying to have a barbecue or if they are indoors in the evening sitting in a dark room



watching television. The Asian roach will “swarm” to these light sources in great numbers.

Management of Asian Roaches

Spraying has little to no effect on these recent introductions to the Florida landscape. They cover such vast areas, with a high breeding capacity, that they have become difficult to control. Old citrus orchards and stands of oaks seem to be preferred harborage. The Asian roach is an excellent hitchhiker. It will be found in strawberry shipments, loads of hay and horse trailers, mulch for landscaping and other similar conveyances. They have also been found to live very well under mulch and leaf litter that accumulates on the roof of structures in the shade.

When they invade indoors they enter through fine gaps around window screens and around doors. During heavy infestations it is important to have all of these fine gaps sealed well. In the summer they mate and disperse.

Evenly broadcast InTice 10 Perimeter granules per label rates across the outer perimeter of the property between the source area and the home. In extremely heavy infestations, an entire yard must be treated.

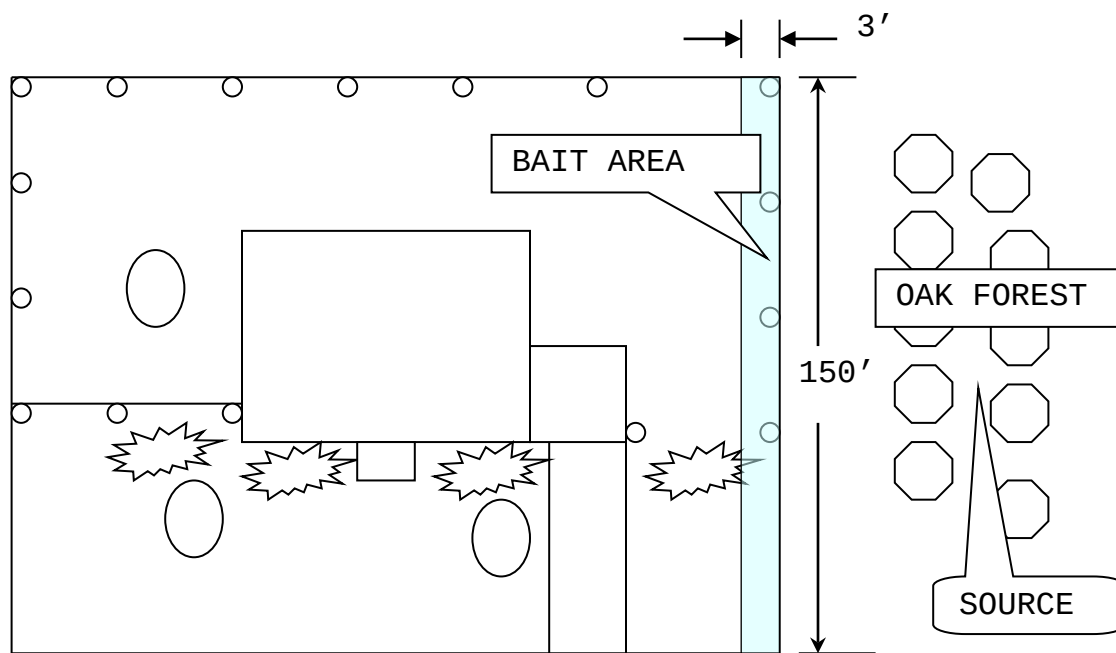
CUSTOMER EDUCATION – the Asian roach is one of the most frustrating pests for the customer. It is essential that customers be given the correct information at the start.

1. The Asian roach prefers to live outside, but will enter through gaps in windows/doors, cracks/crevices, garages, patios, etc. The customer needs to be shown these micro-gaps surrounding window screens and framework in order to be convinced to seal these spots. It's easy to convince the customers when you point out a dead Asian roach in between the window and the screen, showing that it got past the screen. Once inside, Asian roaches can visit literally anywhere within the home, not just the kitchen. They often show up on the side of a wall where no food or harborage can be found.
2. The source is often not on the customer's property, making it a neighborhood problem.
3. It may take numerous extra services to keep the population down enough to reduce the pest pressure on the structure depending upon how many acres of infested pastureland/orchardland/fields are nearby.
4. Lighting affects attractancy of these roaches...darker homes have many fewer attracted to the structure than lighter homes. Porch lights should be changed over to yellow/amber bulbs that do not tend to attract as many insects or roaches.
5. The approach will be one of concentrated baiting on the perimeter of the customer's property, away from the structure, and residual treatment with repellent products around the entryways of the structure. Residual products do a good job at maintaining an effective barrier, but will not keep the roaches from entering through gaps.



SUGGESTED PROTOCOL

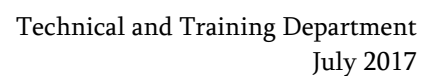
1. Educate the customer (above).
2. Inspect for areas of activity. Be sure to observe the areas around the customer's property for likely sources.
3. Once identified as Asian roaches, estimate the square footage to be baited.
 - A. Bait will be applied in a three-foot wide band along the edge of the property, on the sides that are next to wooded areas, citrus groves, etc.
 - B. Example below:
 - C. After all cracks and crevices have been caulked and sealed, InTice 10 Perimeter bait during the rainy season or Advion Insect G during dry periods is applied to the 3' band between the source and the structure at label rates. The example band below is 3' X 150' = 450 sq.ft. The total amount of bait mix would be $\frac{1}{2}$ - 1 pound. This should be repeated weekly until the population reduces enough to not be a problem. In extreme cases, the entire yard may have to be broadcast with one or more baits.
 - D. Residual spot applications surrounding windows and doors where there are fine gaps that have not yet been sealed can be made with Temprid, Tempo Ultra WP, Arilon or Alpine WSG.



GreenUP Technicians and Inspectors encountering large numbers of Asian Roaches surrounding a home should try and cross-sell Massey's Pest Prevention Program.

PRE/POST TEST

1. What is the most difficult part of dealing with Asian Roaches?
2. Why do you need to bait in a band away from the house?
3. Why is customer education important when dealing with Asian roaches?
4. Why do we apply a residual around windows and doorways?
5. Why won't spraying solve an Asian roach problem?



PRE/POST TEST ANSWERS

1. What is the most difficult part of dealing with Asian Roaches?

The source is not on the customer's property and cannot be treated directly.

2. Why do you need to bait in a band away from the house?

The band away from the house should stop many before they reach the house. Also, the bait will attract them away from the house, not toward it.

3. Why is customer education important when dealing with Asian roaches?

It will not be a quick, simple solution. Weekly baiting will be necessary until the population is reduced, thus reducing pest pressure on the structure.

4. Why do we apply a residual around windows and doorways?

If gaps are not sealed, Asian roaches will enter...Better to have them enter with some residual on their paws!

5. Why won't spraying solve an Asian roach problem?

You would have to spray all of the source areas – the forest, the neighbors' property, fields, etc.

There has been a lot of coverage in the news lately on a virus known as Zika. This Technical Bulletin is intended to inform you of the virus so that you can provide information to Customers who may inquire about it. The information below has been compiled from the Centers for Disease Control website.

What is Zika?

Zika is a disease caused by the Zika virus that is spread from person to person by mosquitoes. It is spread by 2 species of *Aedes spp.* mosquitoes.

Has Zika been identified in the United States?

In January 2016 alone, 10 cases of the Zika virus have been found in 5 states. All of these cases are in people who have travelled to countries from south of the border. They were NOT infected here in the United States. So far, the virus has not been found in any mosquitoes in the United States. Although, the species of mosquito that carries the diseases, *Aedes spp.* is found in the United States, the Centers for Disease Control (CDC) has warned everyone to be on the lookout for the potential and likely spread of the disease into the United States.

Where has Zika been identified?

The CDC has issued travel warnings for countries in the Caribbean, including Puerto Rico and the Virgin Islands, Central America, South America, Cape Verde and Samoa. Because of the threat of birth defects, described below, they are urging pregnant women to stop travel to these areas. For specific countries, you can direct the Customer to the Centers for Disease Control Website.

How is Zika spread?

Zika is spread to people through mosquito bites. It is unknown at this time if it can be spread from person to person via blood transfusions or other bodily fluids. It can also be passed from mother to fetus during pregnancy, although it is unknown how often this occurs.

What are the symptoms of Zika?

The most common symptoms of Zika are fever, rash, joint pain and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting from several days to a week. Zika usually causes such mild symptoms and most infected people don't even notice it. Severe cases requiring hospitalization are uncommon.

What is the main concern of this virus?

The main concern with this disease are the issues that are believed to occur when a mosquito infected with the Zika virus bites a pregnant woman where it can be transmitted from mother to baby. It is suspected that Zika causes a severe birth defect called microcephaly, which causes underdevelopment of the head and brain. Babies with this disease often miscarry before they are born, or they die at birth. Surviving babies are usually disabled. It is known that Zika belongs to a family of viruses not known to cause birth defects and birth defects had not been noticed in countries that had Zika previously. Since it's hard to test for Zika, there's no rapid detection test, making research difficult.

Is there a vaccine or treatment for the Zika virus?

There is currently no vaccine or treatment for the Zika virus and it could be 3-5 years before one is available.

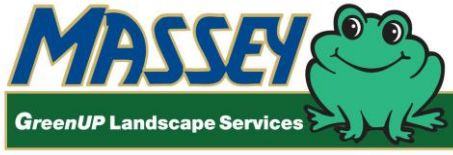
How can people protect themselves from becoming infected with Zika?

Pregnant women are urged not to travel to areas where the Zika virus has been identified and others who travel to these areas are asked to practice steps to prevent mosquito bites including:

- Wearing insect repellent containing at least 20% Deet and reapplying every few hours
 - Always follow label instructions
 - Reapply as directed
 - Do not apply repellent on the skin under clothing
- Covering exposed skin by wearing hats, long sleeve shirts and long pants
- Avoiding wooded or grassy areas

If a Customer asks about this disease, let them know that there have been no mosquitoes in the United States that have been found to carry this disease. The cases of the Zika virus that have occurred in the US are from people who have returned from areas where it is prevalent. We need to be aware that because the species of mosquito that carries the virus can be found in the US, there is the potential for Zika to be carried and spread locally.

As more information is released regarding this disease and its potential spread into the US, we will update Team Members so if approached by Customers you will have the most up-to-date information.



WEEKLY TRAINING SESSION



Turf Damaging Caterpillars

Topic Category: Lawn

Recordable Verifiable Training Hours: 0.5

Objectives: This lesson is designed to teach turf damaging caterpillar identification, biology and control.

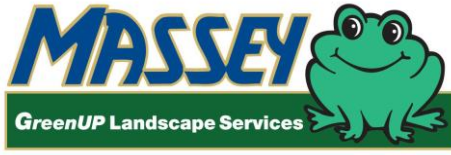
Length of lesson: Approx 30 minutes.

Materials needed:

- Training Guideline
- Training Document Turf Damaging Caterpillars (GreenUp Protocols\Individual Protocols\Lawn Damaging Insects)
- Collect samples of Turf Damaging Caterpillars 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 Turf Damaging Caterpillars.
- 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.
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WEEKLY TRAINING SESSION

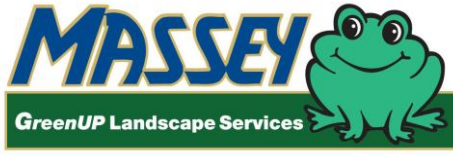


Turf Damaging Caterpillars

Name _____ Date _____

PRE & POST TEST

1. T or F Noticeable injury from sod webworms can be seen within 2 weeks of hatching.
2. T or F Fall armyworms may feed during the day.
3. T or F Grass loopers are a primary pest of Zoysiagrass, but will feed in other grasses.
4. T or F Turf damaging caterpillars cause damage by sucking of the plant juices.
5. T or F Excessive fertilization will reduce the chance of Army worm infestation.
6. Turf growing in _____ conditions and _____ sod is most prone to permanent injury from turf damaging caterpillars.
 - a. Sunny/Zoysiagrass
 - b. Shady/Bermudagrass
 - c. Wet/Seville
 - d. Shady/Newly Installed
7. T or F Applications of Acelepryn made prior to egg hatch are effective to prevent new infestations.
8. T or F When turf damaging caterpillars are a problem at the time of regular service using Arena alone, Bifenthrin should be added to the treatment.
9. T or F Retreatment for turf damaging caterpillars problems should be performed with a broadcast application of Bifenthrin.
10. T or F When army worms are difficult to control, Acelepryn slurry should be used.



WEEKLY TRAINING SESSION



Turf Damaging Caterpillars

PRE & POST TEST ANSWER KEY

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GREENUP LAWN, TREE & SHRUB CARE SERVICE PROTOCOLS

TURF DAMAGING CATERPILLARS

There are a number of different caterpillars that feed on the foliage of various species of turf. Among them are Tropical Sod Webworms, Grass Loopers and Fall Armyworms.



Tropical Sod Webworm



Fall Armyworm



Grass Looper

The Tropical Sod Webworm is the most common of the lawn damaging caterpillars in Florida. Tropical sod webworm adults are small, tan to gray moths with a wingspan of $\frac{3}{4}$ to 1 inch. They do not cause damage. Moths hide in shrubs and other sheltered areas during the day and fly low when disturbed. Females lay clusters of 6-15 white eggs on grass blades at night. Eggs hatch within 7 days. Noticeable injury will be seen within two weeks of hatching. One generation of tropical sod webworm requires about 6 weeks. Three to four generations occur in Florida each year. Tropical sod webworm is most active from July through November in North Florida, June through November in Central Florida, and may occur year-round in south Florida. Tropical sod webworm larvae feed on all turf types grown in Florida.

Fall armyworm adults are larger, with a wingspan of nearly $1\frac{1}{2}$ inches. Females are almost completely gray, but males are shaded gray and brown and have white spots near the center of the wing and near the tip. Fall armyworm eggs are laid in clusters of 50-150 along grass blades or on non-plant surfaces. Eggs hatch within one to two weeks and develop into adults in about 4 weeks under warm weather conditions.

Fall armyworms occur year-round in south Florida and migrate northward each spring. This means that populations can be damaging in the spring in south Florida, but don't build up until fall in north Florida and Georgia. Fall armyworms will feed on all turfgrasses, but prefer Bermudagrass. Fall armyworm larvae may feed during the early and later parts of the day. Green or brown pellets of frass may be visible on the soil surface, indicating that larger larvae are present.

Grass looper adults are the largest of the group, with a wingspan of $1\frac{1}{2}$ inches. Wings are tan to yellowish-brown in color with vertical lines and round spots. Eggs are laid singly on grass blades. Eggs hatch within one to two weeks and develop into adults in about 4 weeks. Striped grass loopers also occur year-round in south Florida, and are not a problem until fall in north Florida. Striped grass looper is primarily a pest on bahiagrass in pastures, but will readily infest other turfgrasses. Larvae of these species are active at night and will hide in a curled position near the soil surface during the day.



GREENUP LAWN, TREE & SHRUB CARE SERVICE PROTOCOLS

TURF DAMAGING CATERPILLARS

To find larvae, part the grass in suspect areas and look for chewed leaves, silken webs, green or brown frass, and larvae.



Sod webworm damage –
Note chewing to the grass blades



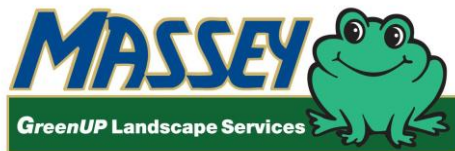
Sod webworm resting in thatch

Cultural practices can influence turfgrass susceptibility to these caterpillar species. Excessive fertilization causes rapid leaf growth and increases the chance of caterpillar problems. Female moths that are ready to lay eggs are attracted to the succulent leaves. Turf will recover from damage if properly irrigated and kept healthy. Turf growing in shady conditions and newly installed sod is most prone to permanent injury. This is because the caterpillars are removing the leaf surface, thereby reducing the plants ability to gather sunlight and create food for its root system through the process of photosynthesis. Drought or low mowing heights may also reduce or prevent grass recovery.

Control

Attempts to control the adult moths are not effective. Applications made prior to egg hatch will only be effective when Acelepryn is used. For this reason, a new infestation with noticeable damage may occur within two weeks of a previous application of materials other than Acelepryn. Applications to control the caterpillars should be made when the larvae are present, unless preventive applications with Acelepryn are being made.

When caterpillars are present, broadcast applications should be made to control the problem. Spot treating is typically not effective since there may be areas where young caterpillars are present without noticeable injury. Regular service applications will control the problem when Bifenthrin is contained in the application. Arena does not contain Bifenthrin, but Aloft does. When Arena is being applied for regular service and turf damaging caterpillars are present, ½ ounce of Bifenthrin per 1000 sq. ft. will need to be added to the mix. When the regular service is not being performed, Bifenthrin alone should be applied at a rate of ½ ounce per 1000 sq. ft. It is not cost effective to apply Arena with Bifenthrin when sod webworms are the only target pest. Army worms can be difficult to control in certain situations. Where this is the case, apply the Acelepryn Slurry. The rate is directed on the label.



WEEKLY TRAINING SESSION



Turf Damaging Caterpillars GA

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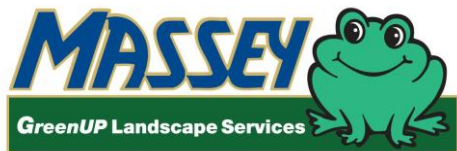
Length of lesson: Approx 30 minutes.

Materials needed:

- Training Guideline
- Training Document Turf Damaging Caterpillars (GreenUp Protocols\Individual Protocols\Lawn Damaging Insects)
- Collect samples of Turf Damaging Caterpillars from the field, if available.
- Pre- and Post- tests.

Training Guidelines:

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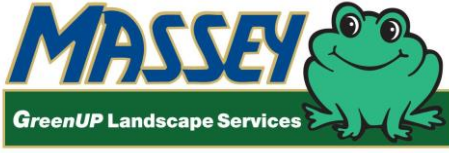


Turf Damaging Caterpillars GA

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4. T or F Turf damaging caterpillars cause damage by sucking of the plant juices.
5. T or F Excessive fertilization will reduce the chance of Army worm infestation.
6. Turf growing in _____ conditions and _____ sod is most prone to permanent injury from turf damaging caterpillars.
 - a. Sunny/Zoysiagrass
 - b. Shady/Bermudagrass
 - c. Wet/Tall Fescue
 - d. Shady/Newly Installed
7. T or F Retreatment for turf damaging caterpillars problems should be performed with a broadcast application of Bifenthrin.
8. T or F When army worms are difficult to control, Acelepryn slurry should be used.



WEEKLY TRAINING SESSION



Turf Damaging Caterpillars GA

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Fall Armyworm



Grass Looper

The Tropical Sod Webworm is the most common of the lawn damaging caterpillars in Florida. Tropical sod webworm adults are small, tan to gray moths with a wingspan of $\frac{3}{4}$ to 1 inch. They do not cause damage. Moths hide in shrubs and other sheltered areas during the day and fly low when disturbed. Females lay clusters of 6-15 white eggs on grass blades at night. Eggs hatch within 7 days. Noticeable injury will be seen within two weeks of hatching. One generation of tropical sod webworm requires about 6 weeks. Three to four generations occur in Florida each year. Tropical sod webworm is most active from July through November in North Florida, June through November in Central Florida, and may occur year-round in south Florida. Tropical sod webworm larvae feed on all turf types grown in Florida.

Fall armyworm adults are larger, with a wingspan of nearly $1\frac{1}{2}$ inches. Females are almost completely gray, but males are shaded gray and brown and have white spots near the center of the wing and near the tip. Fall armyworm eggs are laid in clusters of 50-150 along grass blades or on non-plant surfaces. Eggs hatch within one to two weeks and develop into adults in about 4 weeks under warm weather conditions.

Fall armyworms occur year-round in south Florida and migrate northward each spring. This means that populations can be damaging in the spring in south Florida, but don't build up until fall in north Florida and Georgia. Fall armyworms will feed on all turfgrasses, but prefer Bermudagrass. Fall armyworm larvae may feed during the early and later parts of the day. Green or brown pellets of frass may be visible on the soil surface, indicating that larger larvae are present.

Grass looper adults are the largest of the group, with a wingspan of $1\frac{1}{2}$ inches. Wings are tan to yellowish-brown in color with vertical lines and round spots. Eggs are laid singly on grass blades. Eggs hatch within one to two weeks and develop into adults in about 4 weeks. Striped grass loopers also occur year-round in south Florida, and are not a problem until fall in north Florida. Striped grass looper is primarily a pest on bahiagrass in pastures, but will readily infest other turfgrasses. Larvae of these species are active at night and will hide in a curled position near the soil surface during the day.



GREENUP LAWN, TREE & SHRUB CARE SERVICE PROTOCOLS

TURF DAMAGING CATERPILLARS

To find larvae, part the grass in suspect areas and look for chewed leaves, silken webs, green or brown frass, and larvae.



Sod webworm damage –
Note chewing to the grass blades



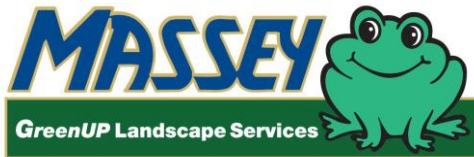
Sod webworm resting in thatch

Cultural practices can influence turfgrass susceptibility to these caterpillar species. Excessive fertilization causes rapid leaf growth and increases the chance of caterpillar problems. Female moths that are ready to lay eggs are attracted to the succulent leaves. Turf will recover from damage if properly irrigated and kept healthy. Turf growing in shady conditions and newly installed sod is most prone to permanent injury. This is because the caterpillars are removing the leaf surface, thereby reducing the plants ability to gather sunlight and create food for its root system through the process of photosynthesis. Drought or low mowing heights may also reduce or prevent grass recovery.

Control

Attempts to control the adult moths are not effective. Applications made prior to egg hatch will only be effective when Acelepryn is used. For this reason, a new infestation with noticeable damage may occur within two weeks of a previous application of materials other than Acelepryn. Applications to control the caterpillars should be made when the larvae are present, unless preventive applications with Acelepryn are being made.

When caterpillars are present, broadcast applications should be made to control the problem. Spot treating is typically not effective since there may be areas where young caterpillars are present without noticeable injury. Regular service applications will control the problem when Bifenthrin is contained in the application. Arena does not contain Bifenthrin, but Aloft does. When Arena is being applied for regular service and turf damaging caterpillars are present, ½ ounce of Bifenthrin per 1000 sq. ft. will need to be added to the mix. When the regular service is not being performed, Bifenthrin alone should be applied at a rate of ½ ounce per 1000 sq. ft. It is not cost effective to apply Arena with Bifenthrin when sod webworms are the only target pest. Army worms can be difficult to control in certain situations. Where this is the case, apply the Acelepryn Slurry. The rate is directed on the label.



WEEKLY TRAINING SESSION



Shrub Damaging Insects

Topic Category: Tree and Shrub

Recordable Verifiable Training Hours: 0.5

Objectives: This lesson is designed to teach the identification and biology of many common shrub damaging insects.

Length of lesson: Approx 30 minutes.

Materials needed:

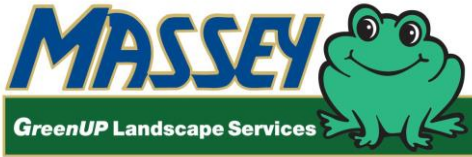
- Shrub Damaging Insects Training Document (G:\Shared\GreenUp Reference Materials\Training Documents\Ppresentations\Shrub Damaging Insects NGA):
- Pre and Post tests

Training Guidelines:

- Make copies of the tests and training materials for all Team members attending.
- Collect samples of various shrub damaging insects from the field if possible.
- 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 form
- Distribute and review the training materials. 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.
 - Collect the pre-test and discard.
- Hand out the Post-tests. When complete, have each Specialist pass their test to another Specialist for grading.
- Grade the tests as a group and discuss the answers.
- Collect the tests
- End the training session.
- Record the post test scores on the VTRF for each Team Member.
- 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 Training topics through Massey University.

Training Outline

1. Review the training document for shrub damaging insects. Provide special emphasis on the following:
 - a. How common these insects are in our markets.
 - b. The ID characteristics of the damage patterns.



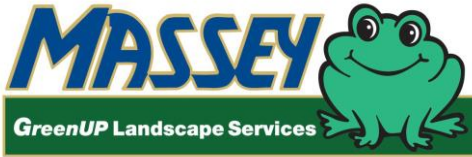
WEEKLY TRAINING SESSION



Shrub Damaging Insects

Pre & Post Test

1. T or F Shrub damaging insects are grouped by the manner in which they feed.
2. T or F Many shrub damaging insects are found on the backsides of the affected leaves.
3. Sooty mold is caused by the _____ secretions of piercing sucking insects.
4. Young scale nymphs are known as _____.
5. Mature male scales are tiny _____.
6. Tea scale is common on _____, _____ and _____.
7. T or F Soft scales produce excess honey dew for sooty mold to grow, but armored scales do not.
8. T or F Mealy bugs are very similar to scales, but they have the ability to move about on the plant throughout their life.
9. _____ are small pear shaped piercing-sucking insects usually less than 1/8th of an inch that feed on the tender new growth of shrubs.
10. T or F Sufficient soil moisture is important for Japanese beetle eggs to develop.
11. _____ are the larval stages of certain flies that tunnel between to top and bottom layers of the leaves.
12. Wood borers usually infest trees that are _____ or _____.



WEEKLY TRAINING SESSION



Shrub Damaging Insects

Pre & Post Test Answer Key

1. ☒ T or F Shrub damaging insects are grouped by the manner in which they feed.
2. ☒ T or F Many shrub damaging insects are found on the backsides of the affected leaves.
3. Sooty mold is caused by the _____honey dew_____ secretions of piercing sucking insects.
4. Young scale nymphs are known as _____crawlers_____.
5. Mature male scales are tiny _____gnats_____.
6. Tea scale is common on _____holly_____, _____camellia_____ and _____ilex shillings_____.
7. ☒ T or F Soft scales produce excess honey dew for sooty mold to grow, but armored scales do not.
8. ☒ T or F Mealy bugs are very similar to scales, but they have the ability to move about on the plant throughout their life.
9. _____Aphids_____ are small pear shaped piercing-sucking insects usually less than 1/8th of an inch that feed on the tender new growth of shrubs.
10. ☒ T or F Sufficient soil moisture is important for Japanese beetle eggs to develop.
11. _____Leaf miners_____ are the larval stages of certain flies that tunnel between to top and bottom layers of the leaves.
12. Wood borers usually infest trees that are _____weak_____ or _____dead_____.



Shrub Damaging Insects



Shrub Damaging Insects

- There are many different types of insects that cause damage to shrubs.
- They can be placed into 5 main groups. They are:
 - Piercing-Sucking Insects
 - Spider Mites
 - Foliage Feeding Insects
 - Leaf Miners
 - Wood Borers



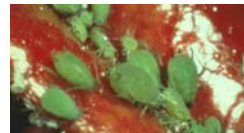
Piercing-Sucking Insects

- Piercing-Sucking Insects have mouthparts shaped like hypodermic needles which, are used to pierce into the plant tissue and suck out the juices.
- This action causes very small spots on the leaves.
 - These spots are usually yellow, but may also be brown or silver in appearance depending on the plant.
- Damage may result in leaf drop or death of the plant.



Piercing-Sucking Insects

- Common Examples of Piercing Sucking Insects are:
 - Scales
 - Mealy Bugs
 - White Fly
 - Lace Bugs
 - Aphids
 - Thrips
 - Technically, thrips have rasping-sucking mouthparts





Sooty Mold

- The black substance on this shrub is called sooty mold.
- Sooty mold is a mold that grows on the honeydew excretions of piercing-sucking insects such as soft scales, aphids and mealy bugs.
 - Sooty mold is controlled by controlling the piercing-sucking insects.
 - Sooty mold will weather away after control has been achieved.



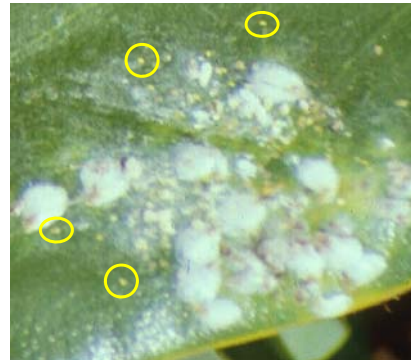
Scales

- 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.





False Oleander Scale

- False Oleander Scale is an armored scale.
- It is commonly found on Magnolias.
- 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.



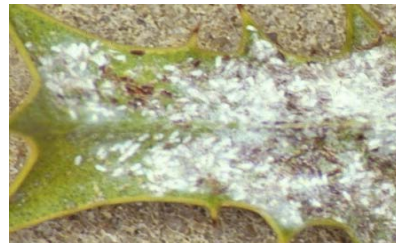
Tea Scale

- 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.





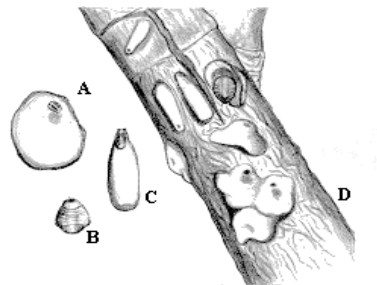
Peach Scale

- Peach Scale is an armored scale.
- It is commonly found on Sinense Ligustrum, and Peach trees.
- 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.

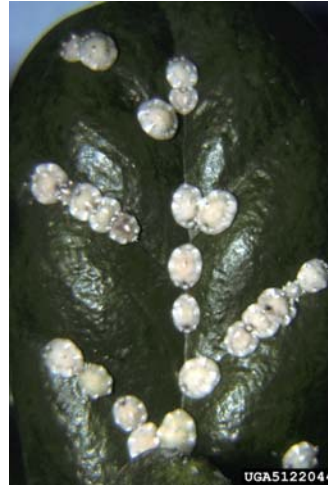


White peach scale. A, Female armor. B, Female. C, Male armor. D, Damage.



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.



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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.



Mealy Bugs

- Mealy bugs are very similar to scales, but they have the ability to move about on the plant throughout their life.
- They can be found on Pittosporum, Podocarpus and various annuals.
- They are found on both sides of the leaves and on the young branches.



Mealy bugs

- The young nymphs are about 1/50th of an inch long and similar in shape to the adult female, except that the legs and antennae are relatively larger and the yellow body is not obscured by wax.
- The nymphs gradually increase to adult size 1/20th of an inch.
- The males form a cocoon of cottony wax and emerge with a red body and a single pair of transparent wings





Mealy Bugs

- Do not confuse this beneficial insect with a Mealy Bug.
- This insect is known as a Mealy Bug Destroyer.
- They feed on Mealy Bugs and other plant damaging insects.



White Fly

- White Fly are insects that are very similar to soft scales.
- They can be found on many plant species, especially Gardenia and Viburnum.
- They are found primarily on the backsides of the leaves.





White Fly

- Eggs are laid on the undersides of the leaves.
- The young nymphs are small transparent to opaque.
- They pupate under the soft wax covering.
- The male and female adults emerge through a T shaped slit as tiny white flies.



Lace Bugs

- Lace bugs range from about about 1/20th to 1/8th of an inch.
- The young are darker in color and wingless.
- Lace bugs are host specific, which means that the lace bugs that feed on Azaleas are not the same lace bugs that feed on Sycamore trees.



Aphids

- Aphids are small pear shaped piercing-sucking insects usually less than 1/8th of an inch.
- They typically feed on the tender new growth or flowers.
- Feeding causes the new growth to stunt and curl.

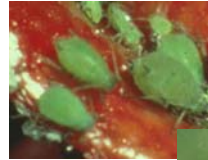


Aphids



Aphids

- Aphids come in many colors, black, purple, green, orange and others.
- Most aphids are wingless, but winged reproductives may be formed when the host plant becomes overcrowded.
- Almost all aphids are female, reproduce without mating and give birth to live young.



Thrips

- Thrips are very small and thin elongated insects with rasping-sucking mouthparts.
- They are typically found on the undersides of the leaves of Viburnum and other shrubs and on the flowers of Gardenia, Roses and many others.
- Their feeding causes the leaves to turn a silver color.
- Brown spots of excrement will be seen.
- Affected flowers will brown prematurely.



Thrips

- The adult lays her eggs in plant tissue.
- The larvae hatch and enter two (maybe more) instars before entering the pre-pupal and pupal stage in the soil.
- The pupae emerge as winged adults and migrate back to the plants.
- The entire cycle from egg to adult requires from 12 to 16 days



Foliage Feeding Insects

- There are many different types of insects that chew the foliage of plants.
- The primary type that we deal with are caterpillars and beetles.
- Grass Hoppers and Katydids will also chew on plant foliage.

Japanese Beetles

- Japanese beetles feed on over 300 species of landscape ornamentals.
- Plants in the rose or cherry families seem to be a favorite targets.



Japanese Beetles

- Adult Japanese beetles live four to six weeks, lay eggs (mostly in mid-August) and die.
- If the soil is sufficiently moist, the eggs will swell and produce larvae in about two weeks.



Japanese Beetles

- The larval stage lives underground feeding on the roots of grass and other plants before maturing into adult beetles in the summer.



Azalea Caterpillars

- Azalea caterpillars are typically a late summer problem.
- They feed in large groups.
- Egg clusters hatch (normally on the new growth) and the young begin skeletonizing the foliage leaving it brown and crispy.





Azalea Caterpillars

- The larvae increase in size and continue to devour foliage.
- There is only one generation each year.



Stinging Caterpillars

- Some caterpillars have spines that can inflict a painful sting.
- The most common in our area are...
 - IO
 - Puss Moth
 - Saddleback.



Bagworm



Leaf Minor

- Leaf Minors are the larval stages of flies.





Leaf Minor

- The larvae tunnel between the top and bottom layers of the leaf.



Leaf Minor

- There are two types
 - Blotch Leaf Minors
 - Serpentine Leaf Minors

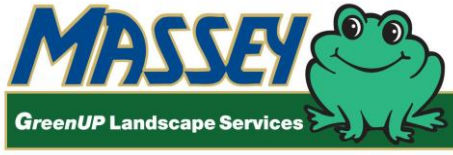




Wood Boring Insects

- There are a number of wood boring insects that will attack trees and shrubs.
- Wood boring insects are the larvae and adult stages of beetles or weevils.
- Usually, they will infest trees that are weak or already dead.





WEEKLY TRAINING SESSION



Turf Damaging Caterpillars

Topic Category: Lawn

Recordable Verifiable Training Hours: 0.5

Objectives: This lesson is designed to teach turf damaging caterpillar identification, biology and control.

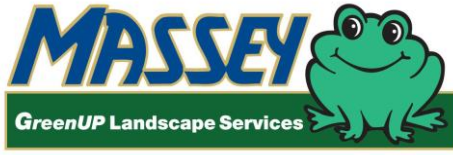
Length of lesson: Approx 30 minutes.

Materials needed:

- Training Guideline
- Training Document Turf Damaging Caterpillars (GreenUp Protocols\Individual Protocols\Lawn Damaging Insects)
- Collect samples of Turf Damaging Caterpillars 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 Turf Damaging Caterpillars.
- 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 Training through Massey University.



WEEKLY TRAINING SESSION

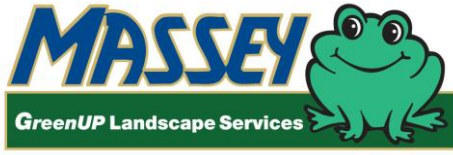


Turf Damaging Caterpillars

Name _____ Date _____

PRE & POST TEST

1. T or F Noticeable injury from sod webworms can be seen within 2 weeks of hatching.
2. T or F Fall armyworms may feed during the day.
3. T or F Grass loopers are a primary pest of Zoysiagrass, but will feed in other grasses.
4. T or F Turf damaging caterpillars cause damage by sucking of the plant juices.
5. T or F Excessive fertilization will reduce the chance of Army worm infestation.
6. Turf growing in _____ conditions and _____ sod is most prone to permanent injury from turf damaging caterpillars.
 - a. Sunny/Zoysiagrass
 - b. Shady/Bermudagrass
 - c. Wet/Seville
 - d. Shady/Newly Installed
7. T or F Applications of Acelepryn made prior to egg hatch are effective to prevent new infestations.
8. T or F When turf damaging caterpillars are a problem at the time of regular service using Arena alone, Bifenthrin should be added to the treatment.
9. T or F Retreatment for turf damaging caterpillars problems should be performed with a broadcast application of Bifenthrin.
10. T or F When army worms are difficult to control, Acelepryn slurry should be used.



WEEKLY TRAINING SESSION



Turf Damaging Caterpillars

PRE & POST TEST ANSWER KEY

1. ☒ T or F Noticeable injury from sod webworms can be seen within 2 weeks of hatching.
2. ☒ T or F Fall armyworms may feed during the day.
3. T or ☒ F Grass loopers are a primary pest of Zoysiagrass, but will feed in other grasses.
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10. ☒ T or F When army worms are difficult to control, Acelepryn slurry should be used.



GREENUP LAWN, TREE & SHRUB CARE SERVICE PROTOCOLS

TURF DAMAGING CATERPILLARS

There are a number of different caterpillars that feed on the foliage of various species of turf. Among them are Tropical Sod Webworms, Grass Loopers and Fall Armyworms.



Tropical Sod Webworm



Fall Armyworm



Grass Looper

The Tropical Sod Webworm is the most common of the lawn damaging caterpillars in Florida. Tropical sod webworm adults are small, tan to gray moths with a wingspan of $\frac{3}{4}$ to 1 inch. They do not cause damage. Moths hide in shrubs and other sheltered areas during the day and fly low when disturbed. Females lay clusters of 6-15 white eggs on grass blades at night. Eggs hatch within 7 days. Noticeable injury will be seen within two weeks of hatching. One generation of tropical sod webworm requires about 6 weeks. Three to four generations occur in Florida each year. Tropical sod webworm is most active from July through November in North Florida, June through November in Central Florida, and may occur year-round in south Florida. Tropical sod webworm larvae feed on all turf types grown in Florida.

Fall armyworm adults are larger, with a wingspan of nearly $1\frac{1}{2}$ inches. Females are almost completely gray, but males are shaded gray and brown and have white spots near the center of the wing and near the tip. Fall armyworm eggs are laid in clusters of 50-150 along grass blades or on non-plant surfaces. Eggs hatch within one to two weeks and develop into adults in about 4 weeks under warm weather conditions.

Fall armyworms occur year-round in south Florida and migrate northward each spring. This means that populations can be damaging in the spring in south Florida, but don't build up until fall in north Florida and Georgia. Fall armyworms will feed on all turfgrasses, but prefer Bermudagrass. Fall armyworm larvae may feed during the early and later parts of the day. Green or brown pellets of frass may be visible on the soil surface, indicating that larger larvae are present.

Grass looper adults are the largest of the group, with a wingspan of $1\frac{1}{2}$ inches. Wings are tan to yellowish-brown in color with vertical lines and round spots. Eggs are laid singly on grass blades. Eggs hatch within one to two weeks and develop into adults in about 4 weeks. Striped grass loopers also occur year-round in south Florida, and are not a problem until fall in north Florida. Striped grass looper is primarily a pest on bahiagrass in pastures, but will readily infest other turfgrasses. Larvae of these species are active at night and will hide in a curled position near the soil surface during the day.



GREENUP LAWN, TREE & SHRUB CARE SERVICE PROTOCOLS

TURF DAMAGING CATERPILLARS

To find larvae, part the grass in suspect areas and look for chewed leaves, silken webs, green or brown frass, and larvae.



Sod webworm damage –
Note chewing to the grass blades



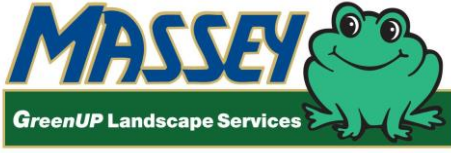
Sod webworm resting in thatch

Cultural practices can influence turfgrass susceptibility to these caterpillar species. Excessive fertilization causes rapid leaf growth and increases the chance of caterpillar problems. Female moths that are ready to lay eggs are attracted to the succulent leaves. Turf will recover from damage if properly irrigated and kept healthy. Turf growing in shady conditions and newly installed sod is most prone to permanent injury. This is because the caterpillars are removing the leaf surface, thereby reducing the plants ability to gather sunlight and create food for its root system through the process of photosynthesis. Drought or low mowing heights may also reduce or prevent grass recovery.

Control

Attempts to control the adult moths are not effective. Applications made prior to egg hatch will only be effective when Acelepryn is used. For this reason, a new infestation with noticeable damage may occur within two weeks of a previous application of materials other than Acelepryn. Applications to control the caterpillars should be made when the larvae are present, unless preventive applications with Acelepryn are being made.

When caterpillars are present, broadcast applications should be made to control the problem. Spot treating is typically not effective since there may be areas where young caterpillars are present without noticeable injury. Regular service applications will control the problem when Bifenthrin is contained in the application. Arena does not contain Bifenthrin, but Aloft does. When Arena is being applied for regular service and turf damaging caterpillars are present, ½ ounce of Bifenthrin per 1000 sq. ft. will need to be added to the mix. When the regular service is not being performed, Bifenthrin alone should be applied at a rate of ½ ounce per 1000 sq. ft. It is not cost effective to apply Arena with Bifenthrin when sod webworms are the only target pest. Army worms can be difficult to control in certain situations. Where this is the case, apply the Acelepryn Slurry. The rate is directed on the label.



WEEKLY TRAINING SESSION



Watering in times of increased precipitation and humidity

A proper irrigation schedule if formulated using factors like evapotranspiration, precipitation rate, infiltration rate, water holding capacity, slope, soil type, plant type, and sun exposure. Weather station driven irrigation controllers use that information to get schedules as close to perfect as possible. We will not be getting into that much detail. There are a few things we can take into consideration to create a workable irrigation schedule.

- The first thing is to make sure the customer has a working rain sensor connected to the controller.
 - This will stop the watering schedule if there has been at least ½” of rainfall.
- Know the water requirements for the plant material withing the zone you are analyzing.
 - Grass requires more water than shrubs. Seasonal flowers require more water than both.
- Conditions of the sunlight in the area being analyzed.
 - Full sun needs more water than shaded areas.
- Sloped areas at 45 degrees or more.
 - Areas on a slope need to be watered more often with less run time.
- Know and understand the precipitation rate of the zone you are analyzing.
 - Precipitation rate depends on the head pressure, nozzle size, head spacing and row spacing
- Have an idea of what the ET rate is for the area you are in.
 - ET rate is a measurement of how fast the atmosphere removes the moisture from the soil.
 - The ET in Florida ranges from about .65 inches per week to 1.95 inches per week.

Being aware of the precipitation rate of the different sprinkler nozzles will make the scheduling prosses much easier. These are a few simple guidelines that can be used:

- | | |
|----------------------|----------------------------|
| • Rotors | .45 inches per hour |
| • Sprays | 1.7 inches per hour |
| • MP Rotators | .4 inches per hour |

These precipitation rates are based on a double row of sprinklers throwing towards each other.

For the state of Florida, our target water amount from an irrigation system on the landscaped areas is around 1” of water per week. We can use the precipitation rates above, along with the head layout of the system in question and determine an adequate runtime and schedule for the property in question.