

Important Insect Pests in Warm Season Turfgrasses

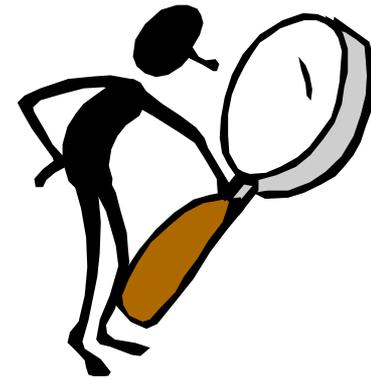
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Photos contributed by: E. Buss, L. Buss, J. Castner, D. Potter, D. Shetlar



If all else fails, look for pests

- Any damage that was masked by summer rains suddenly becomes visible and turf declines quickly.
 - Root-systems damaged by mole cricket, grub, billbug, or bermudagrass scale feeding or tunneling
 - Scalping damage by caterpillars



Good Pest Management Hinges on Proper Diagnosis



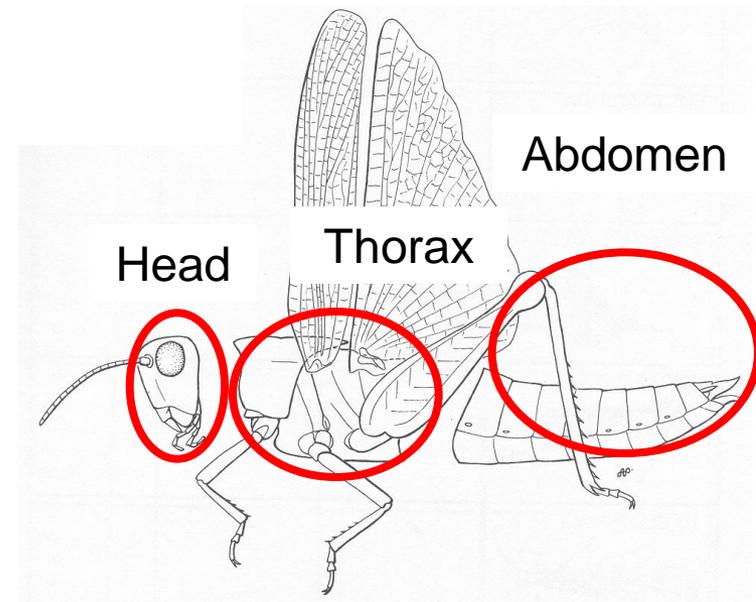
Important Things to Look For

- **Mouthparts** (chewing vs. sucking)
- **Antennae** – beadlike, elbowed, etc.
- **Body shape** (long vs. thin, broad vs. narrow)
- **Legs** – jumping, walking, digging, swimming, ...
- **Wings** (Present or absent? Texture – leathery, membranous, hard? Equal length? Lots of veins or very few?)
- *Body size is not very reliable...*



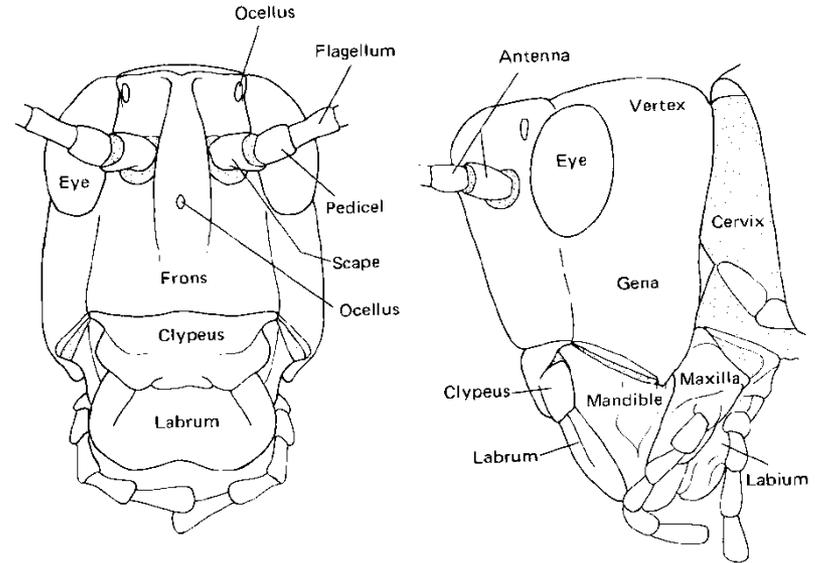
Key Traits of Insects

1. Six jointed legs (3 pairs)
2. 3 main body regions or functional units
3. One pair of antennae

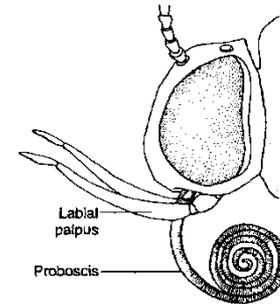
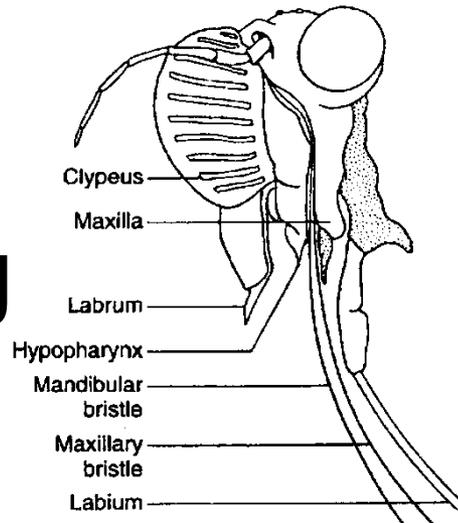


Types of Mouthparts

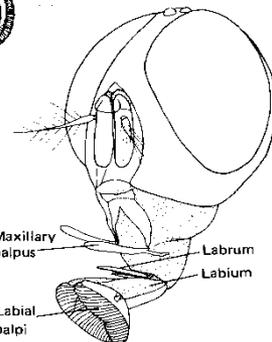
- **Chewing**



- **Piercing-sucking**



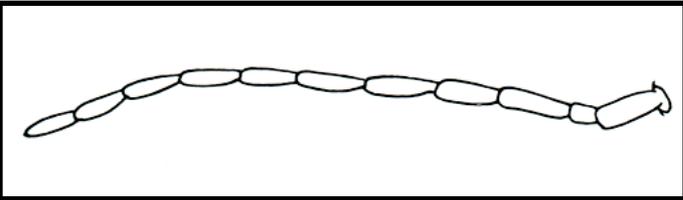
Moth (Order Lepidoptera)



Drawings Smithsonian Institution Press.

Order Hemiptera

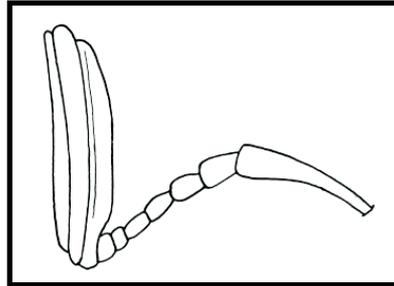
Different Types of Antennae



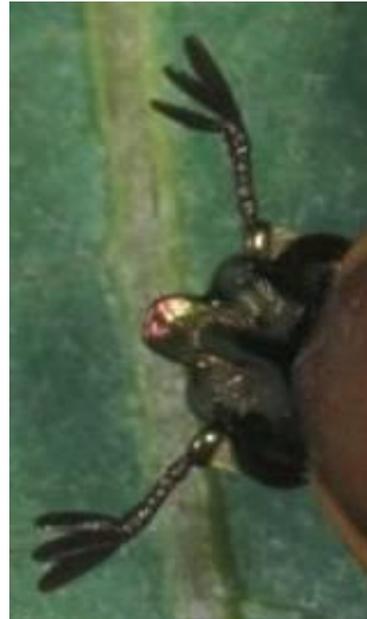
Beaded



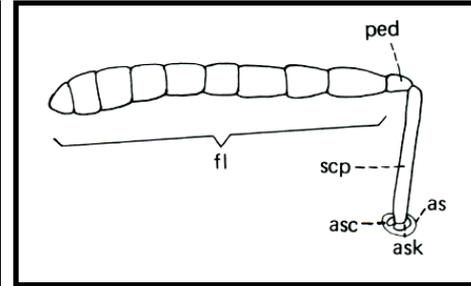
Blister beetle



Clubbed



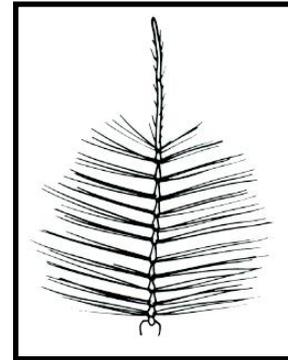
Green June beetle



Elbowed



Ant

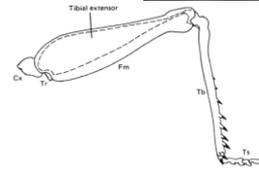


Feathery

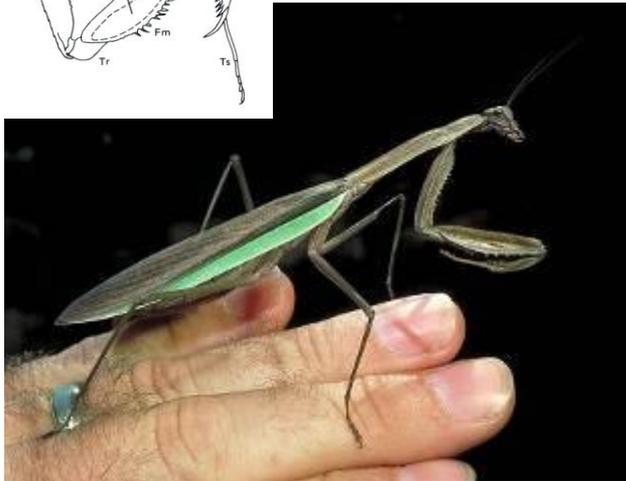
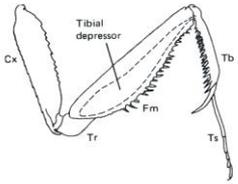


Glowworm adult

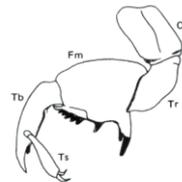
Types of Insect Legs



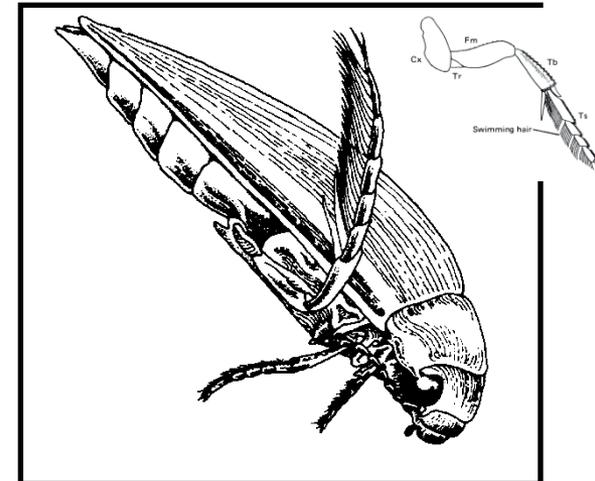
Jumping (saltatorial)



Grasping (raptorial)



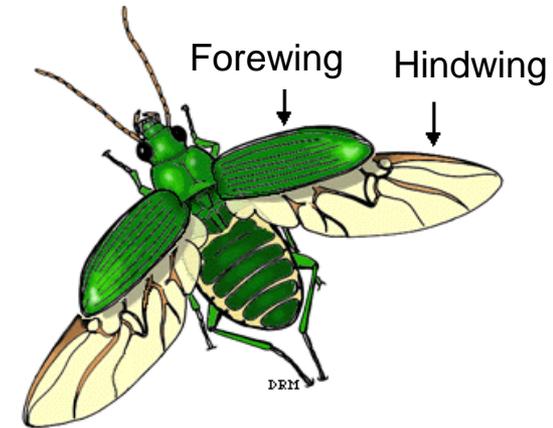
Digging (fossorial)



Swimming (natatorial)

Types of Insect Wings

- Membranous
- Elytra
- Hemelytra
- Tegmina / Leathery



Growth & Development

- Insects shed their skin (molt) to grow and develop into the next life stage
- Insect skin is a hard exoskeleton (cuticle), which provides both protection & structure
- Hormones (ecdysone, juvenile hormone) affect molting & metamorphosis
- Insecticides may mimic hormones and thereby inhibit molting or chitin synthesis, or cause premature molting



Immature Insects

- Usually the most damaging life stage
- Name used usually depends on which type of metamorphosis the order has
 - Simple metamorphosis: **nymph**
 - Complete metamorphosis: **larva**



Nymphs

(Simple Metamorphosis)

Resemble the adults they will later become:

- Similar mouthparts, and usually feed with adults
- Same number of legs (usually 3 pairs of segmented thoracic legs)
- Compound eyes (if adult has them)
- Wing pads in later instars (if adult has wings)



Larvae

(Complete Metamorphosis)

- Larvae and adults look different
 - No wings or external wing pads
 - No compound eyes
 - 0 to 3 pairs of thoracic legs and/or fleshy abdominal prolegs
 - May have different mouthparts than adults
- Head may be distinct (sclerotized) or not
- Type and position of mouthparts vary

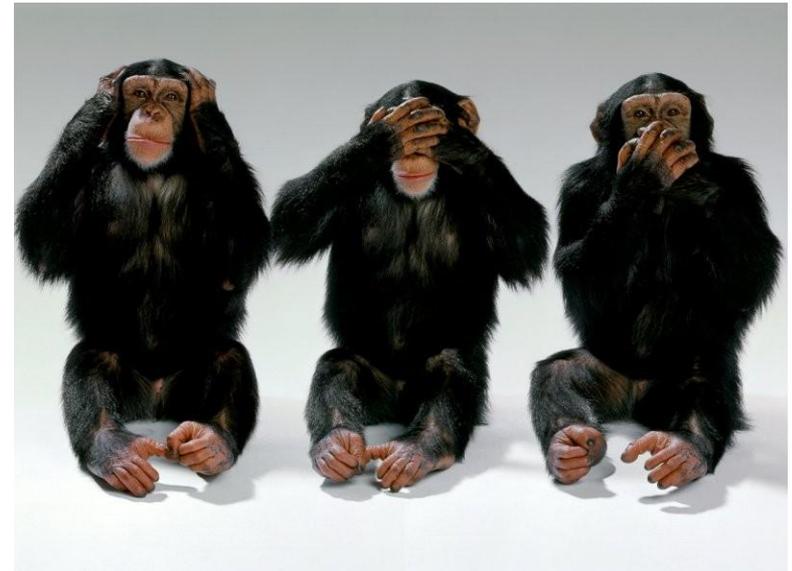
Identification of a Pest / Problem

- Collect a soil or pest sample
 - Compare it to photos in a book, fact sheet or reference collection
 - Show it to your county Extension agent or a knowledgeable colleague
 - Submit it to an identification lab
 - <http://edis.ifas.ufl.edu/pdf/files/SR/SR02200.PDF>



Insects Become Pests Because...

- People can see insects and their damage
- People can hear insects
- People talk about how gross bugs are



1. Scalping Damage





Caterpillar Damage



- Young larvae first scrape leaf surfaces (window-feed).
- Damage often goes unnoticed until larvae are older and eat more leaf tissue.
- Mature larvae notch or consume the grass blades, which gives the grass a scalped appearance.
- Several caterpillar species may feed at the same time.

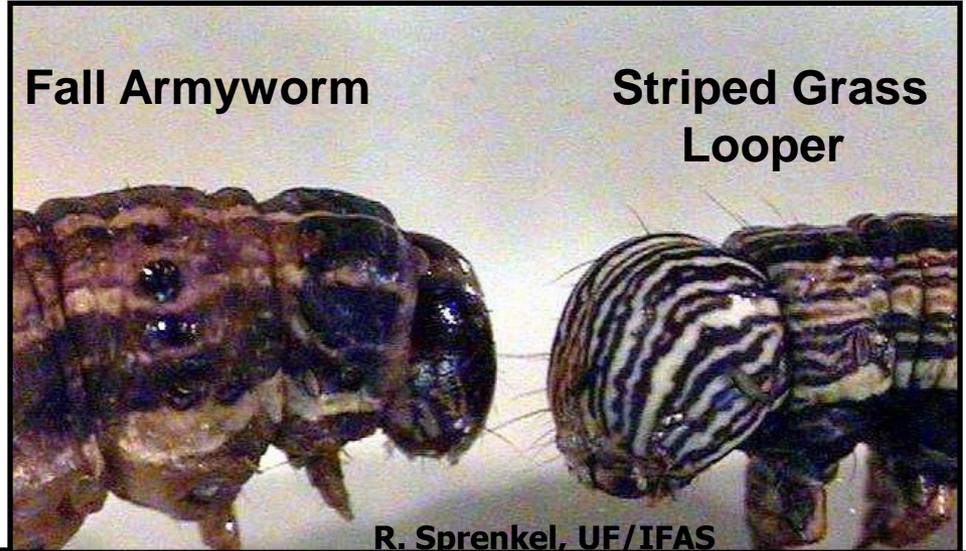


Common Turfgrass Caterpillars

Fiery Skipper



Fall Armyworm



Striped Grass Looper



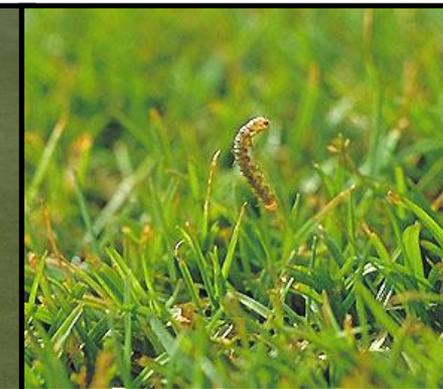
Tropical Sod Webworm

Fall Armyworm

Striped Grass Looper

How Would You Confirm?

- Look for the pest or signs of their presence
 - Examine the thatch for larvae and frass
 - Do a soap flush (2 TBSP per gallon of water) to see if larvae wriggle out (or something else!)



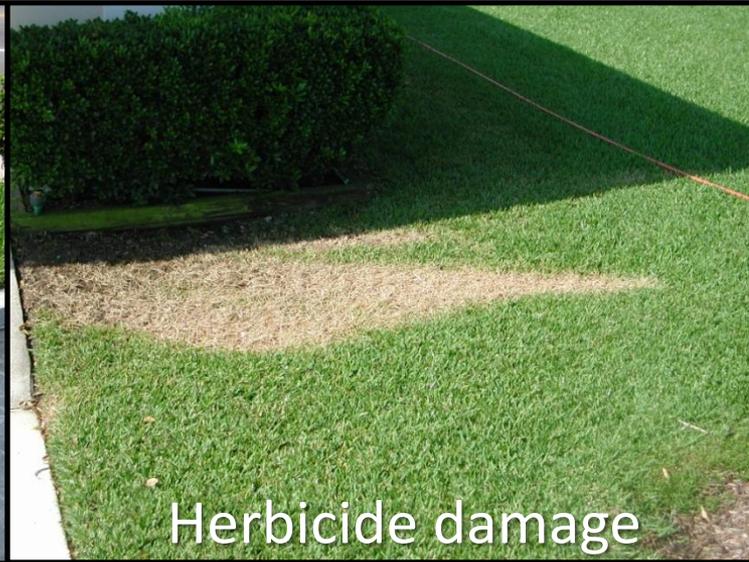
Caterpillar Management

- Infestations begin in the spring, but build in late summer and fall (pops. are year-round in S. FL)
- Be cautious with turf fertility in late summer/fall
- Natural enemies exist, but are hard to manipulate
- Optimal control target: young larvae
 - Eggs and pupae may not be vulnerable, adults fly off
- Reduced-risk product options: Acelepryn, *Bacillus thuringiensis* var. kurstaki (B.t.k.), Conserve, Dimilin
- Rotate modes of action/chemical classes!

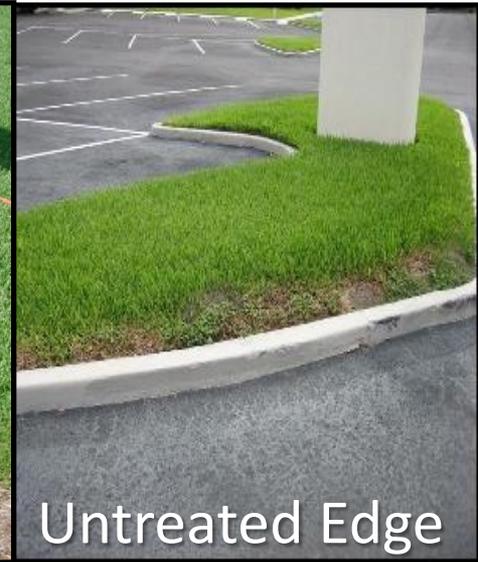
2. Discolored Turf



Scalping damage



Herbicide damage



Untreated Edge



Drought stress



Dog "toilet" area



Chemical edging

Southern Chinch Bug

- Plant growth declines; grass blades turn yellow then brown; patches of grass die



Southern Chinch Bug

(*Blissus insularis*)



- Primary host: St. Augustinegrass
- Eggs are laid singly in the thatch, at the crown, and in leaf sheaths. Nymphs and adults also occur in these areas.
- Nymphs orange with white stripe; adults black with white wings and a black triangle



What do you need to know to manage chinch bugs?

- 1 generation (egg to adult) takes 4-6 wks, and adults can live up to 2 months
- Insecticides kill nymphs and adults, but not the eggs
- Applying more N = faster development, more eggs
- Thick thatch is a great habitat and the organic matter binds certain insecticides (e.g., pyrethroids)
- Insect pathogenic fungi help suppress populations (*Hirsutella* sp. and *Metarhizium anisopliae*)
- Insecticide resistance is real: **ROTATE!!!**

Rhodesgrass Mealybug

(Antonina graminis)



- Infested grass looks “tufted” – has shortened internodes, similar to mite damage
- At least 1 mealybug is near the sprig base



Rhodesgrass Mealybug

- A sporadic pest of >100 grasses; damage is worse in hot, dry weather
- Nymphs and females range in color from dark pink to light yellow and are covered with a white, waxy secretion
- Feed in leaf sheaths, nodes, or at the crown
- Only females; each 1 lays 300-600 eggs
- 1 generation in 4 - 6 wks
- Control: neonicotinoids



Bermudagrass Scale



- Armored scale on stems & rhizomes
- Damage resembles drought-stress
- Accurate ID requires looking at the grass stems and roots
- Control: neonicotinoids



Bermudagrass Mite

(Eriophyes cynodoniensis)



- Eriophyid (gall) mite
- Only host: bermudagrass
- Tiny adults (0.2 mm long) have 2 pairs of front legs
- Damage: reduced turf vigor, tufts of grass with short internodes
- 1 generation = 2 weeks
- Need to scalp, then treat; repeat

3. Mounds and Tunneling



How Would You Confirm?

- Mound/tunnel size and shape
- Presence and location of a hole (or holes)
- Number of mounds in an area
- Time of year
- See if anything goes in or out of the mound
- **Watch out!** Rain flattens mounds...

Ant Problems on Turfgrass

- Volcano-shaped mounds
- Mounds interfere with ball roll
- Mounds kill turf in 3-5 inch areas
- Sand and soil dull the mower blades



Mole Crickets

(Orthoptera: Gryllotalpidae)

- Three damaging invasive species
 - Tawny mole cricket
 - Southern mole cricket
 - Shortwinged mole cricket
- One native species
 - Northern mole cricket

Tawny Mole Cricket
(*Scapteriscus vicinus*)



Southern Mole Cricket
(*Scapteriscus borellii*)



Shortwinged Mole Cricket
(*Scapteriscus abbreviatus*)



Mole Cricket Signs & Symptoms

- Nymphs and adults (all species) tunnel in soil
 - May help aerate the soil, but weakens root system
 - Disrupts the roll of a golf ball, turfgrass uniformity
- Some species feed on turf roots
 - Thins the grass and creates bare spots
 - Sod falls apart; ribbons on farms don't fill in well
- Older nymphs make mounds on soil surface
 - Also interferes with golfing and turf uniformity





Egg Laying and Hatching

- Mated females fly to find a place to lay their eggs
- Eggs mature inside the female for 9-14 days before being laid
- 25-60 (ave. = 40) gray/brown eggs are laid in a small chamber in the soil, 9-30 cm deep
- Eggs develop in soil within 20 days; nymphs hatch from a clutch within a 24-hr period



What do you need to know to manage mole crickets?

- Most eggs hatch from May to July
- Nymphs and adults are nocturnal, so applications timed for early morning or late afternoon may be more successful
- Young nymphs are easier to kill than old nymphs and adults (preventive vs. curative)
- Baits are effective in late summer & fall
- Some insecticides repel mole crickets

Preventive Products

- Neonicotinoids
 - Clothianidin (Arena)
 - Imidacloprid (Merit)
 - Thiamethoxam (Meridian)
- Fipronil (Chipco Choice, TopChoice)
- Indoxacarb (Provaunt)

Curative Products

- Acephate (Orthene)
- Carbaryl (Sevin)
- Trichlorfon (Dylox)

Baits

- Advion
- Dursban
- Sevin



4. Dead Patches of Turfgrass



NEW PEST: The Tuttle Mealybug

(Brevennia rehi)



- Found in Orange and Lee Counties
- Attacks zoysiagrass
- Bodies are pink; make white wax

Tuttle Mealybug



Zoysia Lawn Damage



How can you confirm that grubs are the problem?

Sift through the thatch and top 2-3 inches of soil.



*Does everyone
have a shovel?*

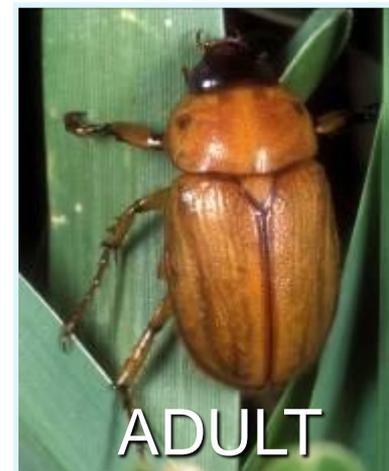
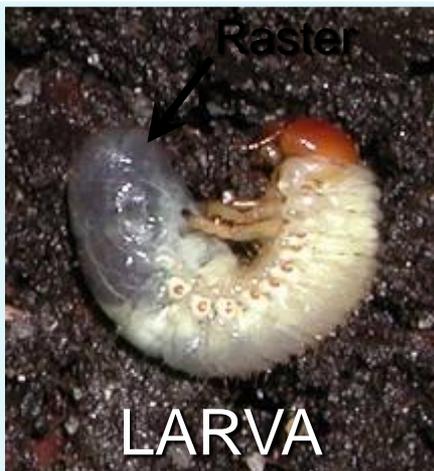


Where do grubs live and feed?



Pest Identification

- Scarabs vary in size, color, and habits, but adults have 3-segmented, clubbed antennae
- Larvae molt 3 times (have 3 instars)
- Look at raster (hair) pattern for grub ID



The “Tug Test”

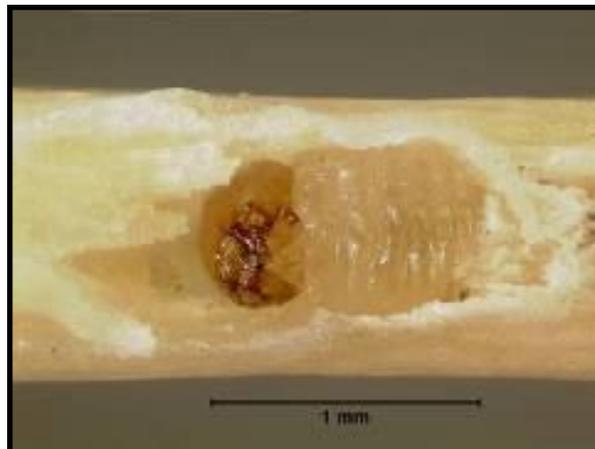
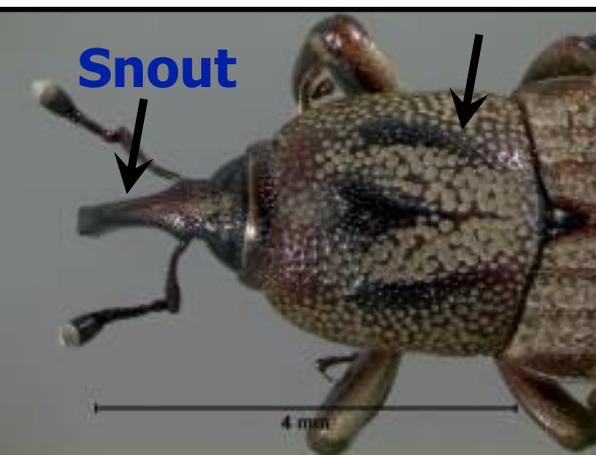


To confirm billbug activity, grasp suspect stems and tug lightly. If billbugs have been feeding, damaged stems will break off. Inspect broken stems for sawdust-like frass.



Hunting Billbug ID

- Hunting billbug adult has a Y-shaped area on pronotum with a parenthesis-like marking on each side; has a snout
- Young larvae are stem borers, and then become root feeders; all larvae are legless



What do you need to know to manage grubs/billbugs?

- Development time depends on scarab species; generally 1-2 generations per year in Florida
- Insecticides (e.g., Arena, Acelepryn, Merit, Meridian) should be targeted against newly hatched first instars; curative control of 3rd instars is harder to achieve (e.g., Dylox, Sevin)
- Some grubs like areas of high organic matter; avoid organic fertilizers (e.g., chicken litter)
- Insecticides usually need to be watered in to reach the soil

Semester-long Online Course

- **Turfgrass and Ornamental Entomology** (3 credits):
 - ENY3510C – undergraduate students (& industry)
 - ENY6905 – graduate students
- Offered spring and fall through the Sakai course management system (e-learning) at UF
- <http://entnemdept.ifas.ufl.edu/academics/>

Thank you!

<http://turf.ufl.edu/>

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University of Florida's
Pest Control Guide for Turfgrass Managers

