Managing Insect Pests
(Keys to Success)

- Knowledge of production system
- Proper identification
- Knowledge of biology and seasonal occurrence
- Proper monitoring and selection of controls
Beneficial Insects

Parasitoids

Predators

Weed feeders

Pollinators

Decomposers
Types of Turf Insect Pests

- Thatch/Root-infesting pests
- Leaf/Stem-infesting pests
  - Chewing
  - Sucking
- Nuisance pests
Thatch/Root-Infesting Pests
Thatch/Root-infesting Pests
White Grubs

- Larval stage of scarab beetles
  - Most destructive pest of turf, especially in the cool season and transition zones
  - Direct damage, and damage from predator activity
Thatch/Root-infesting Pests

White Grubs

- White grubs in Oklahoma
  - *Cyclocephala* (Masked chafers)
  - *Phyllophaga* (May and June beetles)
  - *Cotinis* (Green June beetle)
  - *Popillia japonica* (Japanese beetle)
Thatch/Root-infesting Pests

White Grubs (1-Year Life Cycle)

- Grubs with 1-year life cycle
- Adults fly from June-July
- Eggs hatch in early August, grubs reach full size by late August, feed through October
Thatch/Root-infesting Pests
White Grubs (Multi-year Life Cycle)

- Various species in the genus, *Phyllophaga*
- 1, 2, 3-year life cycles
- Most of life spent as 3rd instar grub
- Control is directed at young grubs

May-June Beetle
Thatch/Root-infesting Pests
White Grubs (Green June Beetle)

- Large beetle (1 inch) that flies during the day (June-July)
- 1-year life cycle
- Grubs make large holes in turf, don’t directly feed on roots, but “dig” tunnels
Grub ID or Checking Butt Hairs

Cyclocephala

Phyllophaga

Japanese Beetle

Green June Beetle
Thatch/Root-infesting Pests
Management of White Grubs

- Inspect for injury, and count numbers per square foot
- Check species
  - Check those butt hairs!
  - Turf can tolerate more annual white grubs than Phyllophaga
- Make sure chemical treatments are applied for maximum efficacy
  - Proper timing
  - Moist soil conditions
  - Water in insecticide
  - Follow label directions
Thatch/Root-infesting Pests
Management of White Grubs

- Biological
- Cultural
- Chemical
Japanese Beetle - Pest of Turf

Preventative - make plants toxic before eggs are laid

Curative - grubs present but no injury present

Rescue - after injury is present
Preventative Grub Insecticides
(Late April - Early June application)

- Neonicotinoids
  - Thiamethoxam (Meridian)
  - Imidaclorpid (Merit)
  - Clothianidin (Arena)

- Anthranilic diamides
  - Chlorantraniliprole (Acelepryn)
  - Cyantraniliprole (Ference)

- Not generally recommended unless area is consistently infested with white grubs
Preventative White Grub Trial

Mean No. Grubs per ft² (± S.E.)

- Untreated check: a
- Allectus 57.6 fl oz: a
- DPX-HGW86 8 fl oz: bc
- Merit 6.4 oz: bc, cd
- Arena 6.4 oz: cd
- Acelepryn 8 fl oz: cd
- Acelepryn 12 fl oz: d
Timing Trial for White Grub Control
(Early = April 6; Late = June 20)

Mean No. Grubs per ft$^2$ (± S.E.)

- Meridian + HGW86 late
- Acelepryn late
- Merit late
- Acelepryn early
- HGW86 late
- Merit early
- Meridian + HGW86 early
- HGW86 early
- Untreated check
Curative/Rescue Grub Insecticides

- Trichlorfon (Dylox)
  - Organophosphate

- Carbaryl (Sevin)
  - Carbamate

- Clothianidin (Arena)
  - Neonicotinoid (until mid-Sept.)
Japanese Beetle - Pest of Turf
Tips for a Successful Curative Treatment

- Water lawn 24 hours before application with 1 to 1.5 inches of water; brings grubs closer to the surface.
- Whenever possible, apply a granular insecticide rather than a liquid.
- Water lightly immediately to activate the insecticide and wash it to the soil surface.
Cultural Control (Annual White Grubs)

- Adults lay few eggs in un-watered turf or under trees; minimize irrigation in July

- Keep turf vigorous (water & fertilizer) once grubs have hatched in August

- Scout irrigated turf in early August by cutting through the turf and pulling it back
Treatment Thresholds

- Curative treatments
- For vigorously growing turf
  - May/June beetles
    - = 4-5 per ft²
  - Annual white grubs
    - = 15-20 per ft²
Leaf/Stem-Infesting Pests
Leaf/Stem-infesting Pests

(Chewing)

- Hunting billbug most common species in Oklahoma
- Bluegrass billbug is more common in northern zone
- Denver billbug common in Colorado, New Mexico, Wyoming
- Phoenix billbug a pest in Arizona and California
Adults measure ¼ to 7/16 of an inch

Weevil “snout” is present

Charcoal grey to black, with numerous punctations on the pronotum

Distinct “Y” – shaped, smooth area located just behind the head, enclosed by shiny, parenthesis-like marks
Leaf/Stem-infesting Pests (Chewing)

- 1 generation per year, but all life stages are often present together
- Overwinter as partially mature larvae
- Adults emerge April-June, but can be found year round; often seen walking across sidewalks in spring
- Will sometimes play “dead” when disturbed
- Egg laying extends through early summer

Hunting/Bluegrass Billbug
Leaf/Stem-infesting Pests
(Chewing)

- Larva is damaging stage
- Plump, legless, somewhat “C” shaped, measuring 3/8 inches long when full grown; tan head capsule
- Can be found in the crown or root zone, just below the thatch

Hunting/Bluegrass Billbug
Leaf/Stem-infesting Pests
(Chewing)

- Larvae tunnel within stem, boring into crown
- Feeding produces dead areas in bermudagrass in spring, may affect sod “holding power”
- Damage sometimes mistaken for “winter kill”
Management of Billbugs

- Early detection difficult - young larvae hidden within stems
- Active infestation signaled by adult activity in spring and again in late fall
- Check dead spots for signs of frass in stems; if stems full of “sawdust”, check crowns for larvae
- Pitfall traps can be used to monitor adults
- Properly managed bermudagrass can recover
- Apply insecticide if necessary, preferably targeted at the adult, or use systemic product (e.g., Merit) to target larvae soon after adults emerge in spring
Leaf/Stem-infesting Pests
(Sucking)

- Chinch bugs are true bugs (Hemiptera) that are pests of grasses
- Four species are important to turf production
- Serious pests:
  - Hairy and Southern
- Occasional pests:
  - Common and Buffalograss

Chinch Bug
Leaf/Stem-infesting Pests
(Sucking)

Life History

- 2 generations/ year
- Overwinter as adults in protected leaf litter, or “bunch grasses”
- Prefer hot, dry conditions
- Very susceptible to fungus disease, *Beauveria bassiana*
Southern chinch bug
- Serious pest of St. Augustinegrass lawns, feeds occasionally on bermudagrass, bahiagrass, centipedegrass, and zoysiagrass
- Adults and nymphs are nearly identical to hairy chinch bugs
- Two types occur, a long-winged form and a short-winged form
- Very common in SE Oklahoma infesting St. Augustinegrass
Damage

- Adults and nymphs cause damage by feeding with their piercing-sucking mouthparts
- Damage results from fluid removal from tissues, and clogging of the conductive tissues
- Grass may turn yellow, then reddish-brown; injury resembles drought damage, and often occurs in patches

Chinch Bug
Leaf/Stem-infesting Pests  
(Sucking)

- Control of southern chinch bug
  - Sample by “flotation”
  - Resistant varieties of St. Augustinegrass are available (e.g., Captiva)
  - Effective thatch management is essential!
  - Mowing height of 3 to 4 inches promotes strong root system, increasing tolerance to chinch bugs
  - Mow frequently with a sharp blade to avoid plant stress

[Image of a container with grass and a text box about Captiva Augustinegrass]
Control of southern chinch bug

- Avoid large amounts of inorganic nitrogen fertilizers
- Use water-insoluble, time-release, or multiple-application fertilizers
- Reduce moisture stress, but don’t overwater (to minimize thatch)
- Some natural enemies can provide effective control

Leaf/Stem-infesting Pests (Sucking)

- Big-eyed bug
- Fire ant
Leaf/Stem-infesting Pests (Sucking)

- Control of southern chinch bug
  - Insecticide resistance is a concern with this pest
  - Insecticides need to penetrate the thatch layer to be really effective (i.e., difficult to control)
  - Some applications time for control of overwintered adults (preventative)
  - Corrective control needed after eggs hatch
Nuisance Pests
Nuisance Pests

- Red imported fire ant
- Red harvester ants can cause health problems as well as aesthetic problems
- Other species of lesser importance; usually cause problems because of mound building
Nuisance Pests

- **Biology**
  - Reproductive, (queens) lay all eggs.
  - Most ant colonies have only one queen, but some like Red Imported Fire Ant have multiple queens, which make them more difficult to control.
  - Workers divide labor (foraging, nest protection, feeding and tending larvae).
Management of Ants

- The key for effective ant management is to kill the reproductive queens.
- Requires one or more treatments of a liquid or granular insecticide.
- Can be applied directly to the mound, and watered in.
- Baits are effective, but should not be applied directly to the mound. Patience is the key!