Common Weed and Insect Strategies in the Southeast

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Weeds and Insects

- Annual bluegrass
- Crabgrass
- Fire ants
- Mole crickets

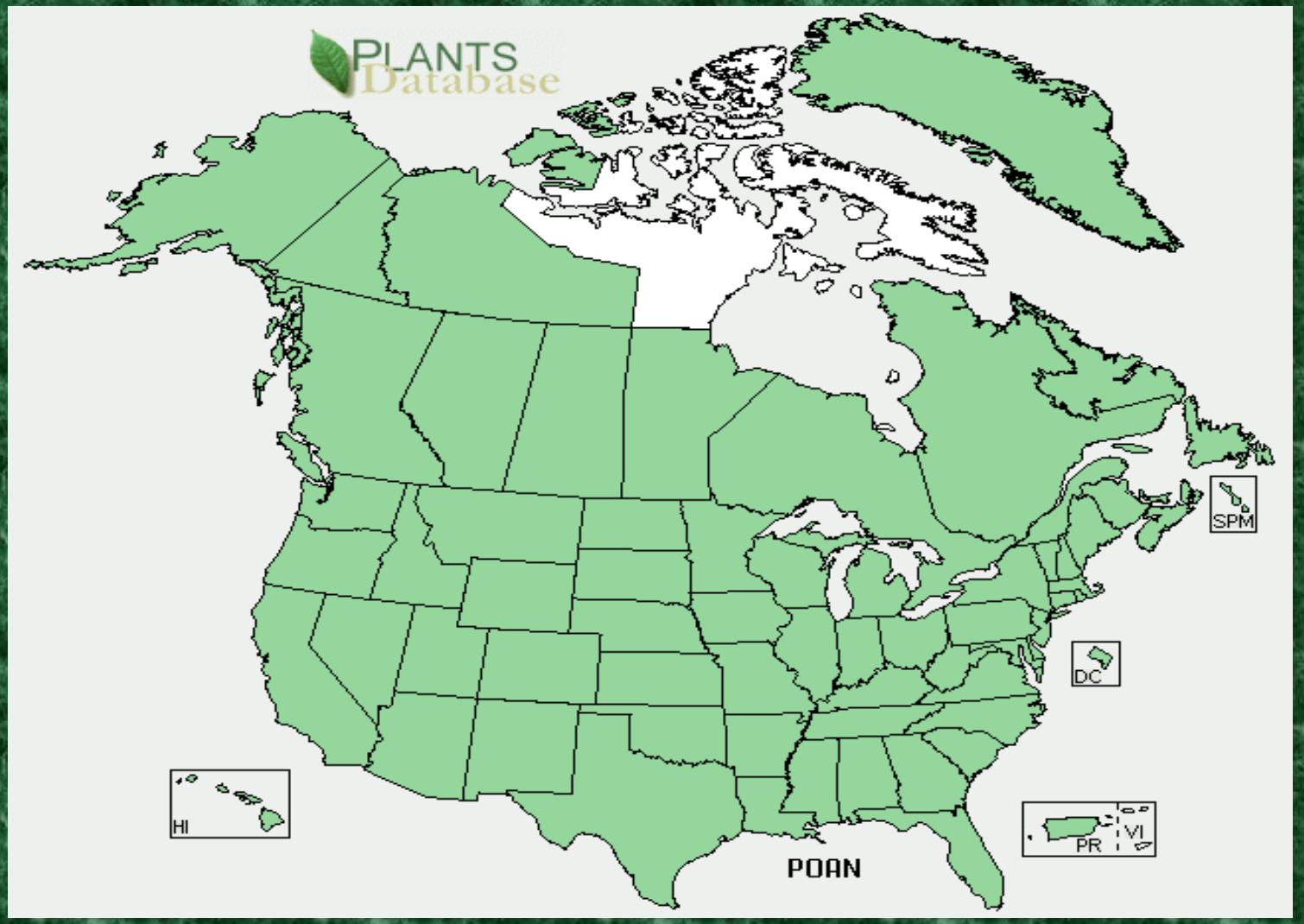
Winter Annuals

- Germinate in fall or early winter.
- Over-winter (slow growth) during coldest months.
- Actively grow and produce seeds in the spring.
- Die in summer as temperatures increase.
- Live for only ONE growing season!

Annual bluegrass
Poa annua

Widely distributed as a winter annual in both cool and warm season turfgrasses.

Distribution



PLANT DESCRIPTION

- ✓ annual type – var. ***annua***

  tufted, bunch type.

- ✓ perennial type – var. ***reptans***

  prostrate, creeping growth habit that roots at nodes.

- ✓ fine to very fine texture
- ✓ light green to yellowish green color
- ✓ high shoot density

- Leaf tip is shaped like that of a bow of a boat.
- Membranous ligule that is rounded with a slightly pointed, jagged tip.

Annual bluegrass

Boat shaped leaf tip

- Annual bluegrass grows to 6-8” high.
- Inflorescence has branched seed clusters that are 1-4” long.
- Seed heads can form as soon as the plant is six weeks old.
- Seeds are the only way annual bluegrass can reproduce.

- The flower is most visible from December to July although sometimes found year round.
- The plant branches multiple times and has 3-8 flowers per spikelet (2,000 seeds per plant).

- Germinates late summer to fall at soil temperatures around 70 degrees F.
- Second germination flush in mid- to late-winter.

USE???

- ✓ Invades closely mowed, irrigated, intensively maintained turf.
- ✓ Greens, tees, fairways, and athletic fields are invaded.

Within a period of 2 to 5 years, it may become the dominant turfgrass under these conditions.

CULTURE

- ✓ Responds to high intensity of culture.
- ✓ Aggressive and very competitive at low mowing heights.

Summer Annuals

- Germinate in spring or early summer.
- Produce seeds in the summer.
- Die with cold weather or frost.
- Live for only ONE growing season!

Crabgrasses

Large (hairy) *Digitaria sanguinalis*

Southern *Digitaria ciliaris*

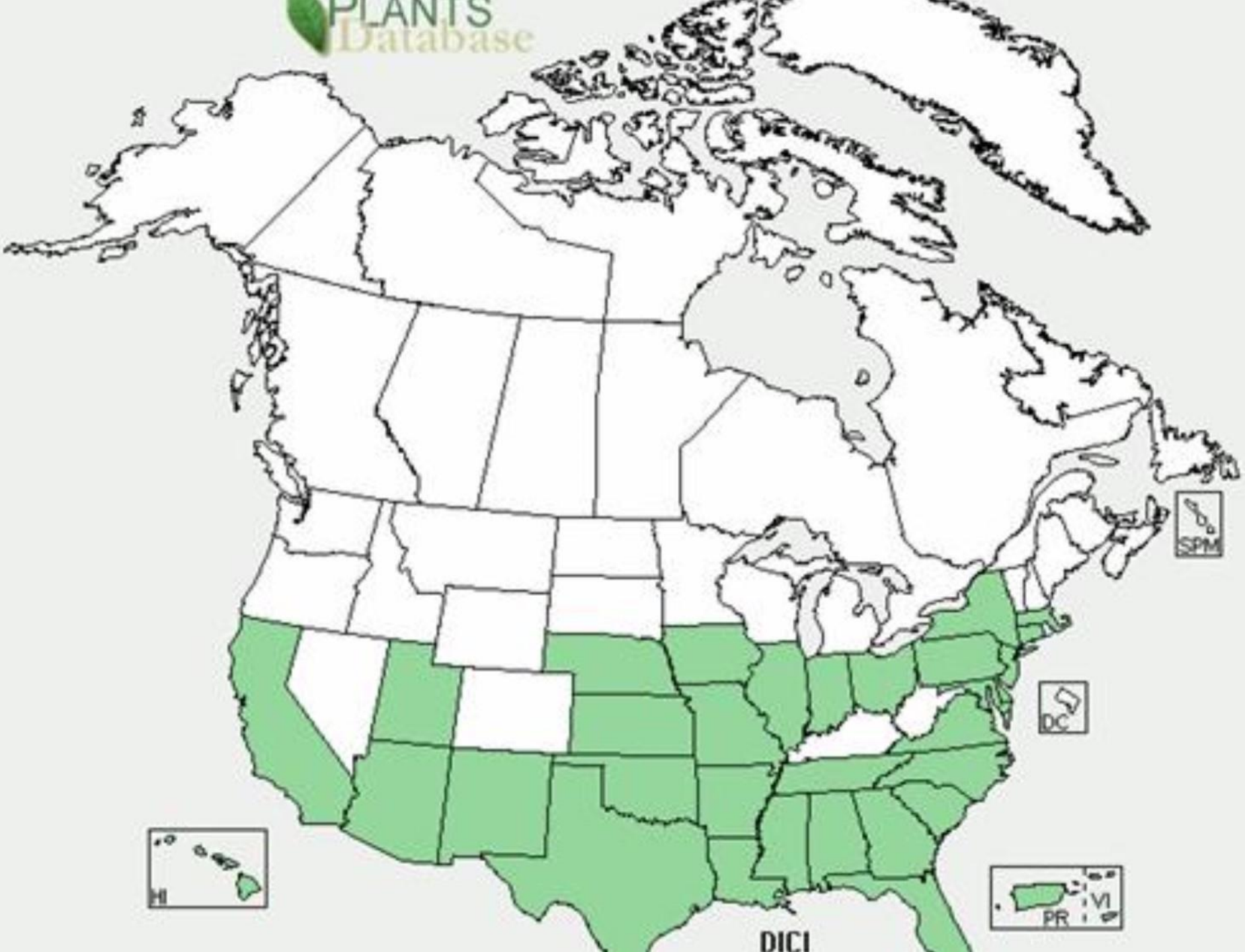
Smooth (small) *Digitaria ischaemum*

Tropical *Digitaria bicornis*

Blanket *Digitaria serotina*

India *Digitaria longiflora*


Large and Southern
crabgrasses are widely
distributed throughout the
South as summer annuals.


PLANTS
Database
SPM
DC
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PR
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PLANT DESCRIPTION

- ✓ Tufted or prostrate to spreading with branched stems that root at the nodes.

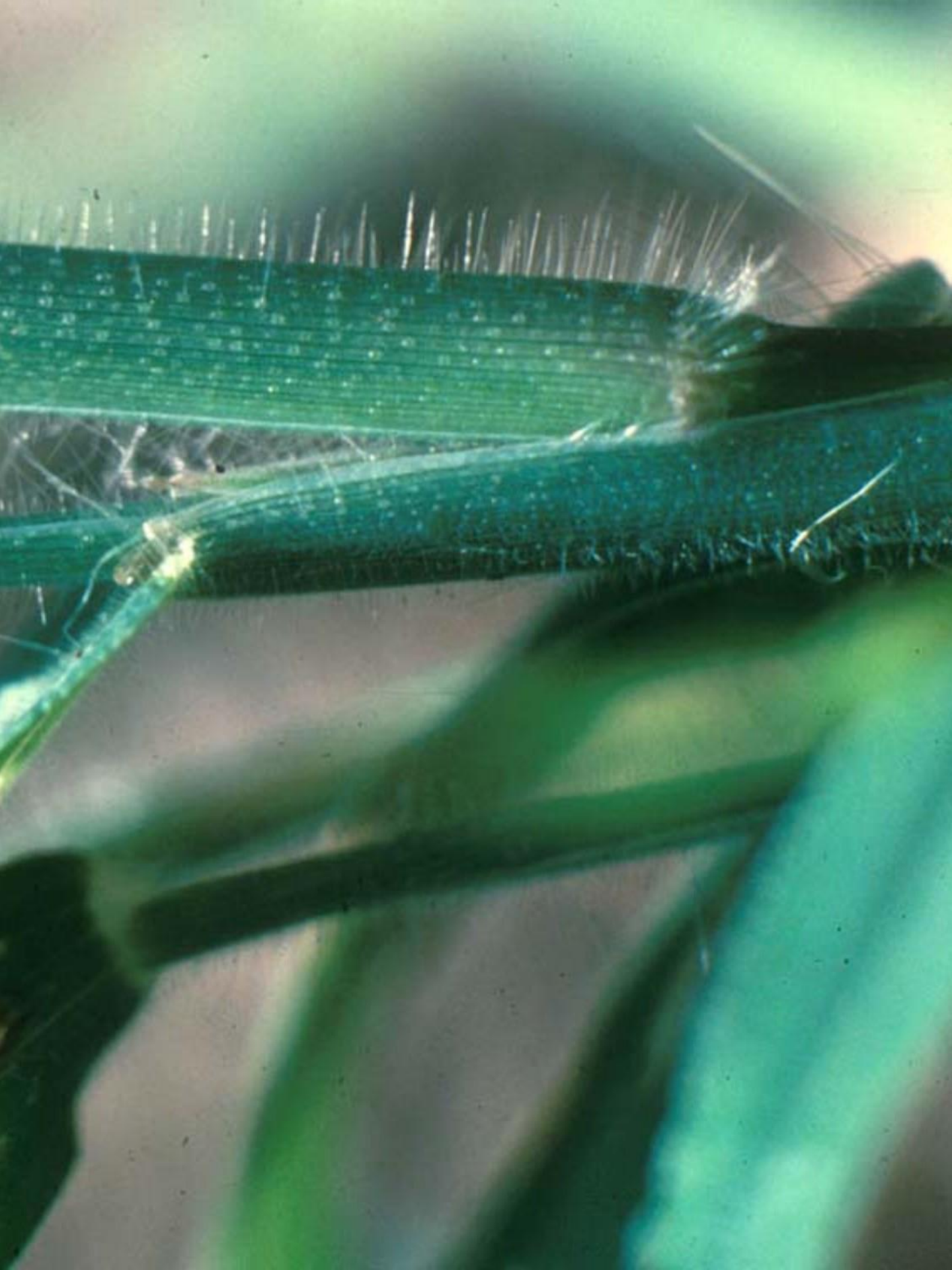
Leaves hairy on both surfaces. “Hairless” on smooth crabgrass.

Southern crabgrass

Smooth crabgrass

Leaf blade, longer than 2 inches, usually hairy on both surfaces, visible toothed membranous ligule at base of leaf. Leaf sheath with dense hairs.

Visible membranous ligule at base of leaf blade.



Leaf sheath smooth, few long hairs at collar (smooth).

Seedhead with two to nine "finger-like" branches. Reproduces by seed.

Crabgrass Germination

- Germinates at soil temperatures: 53 to 58 F degrees F @ 4 inch depth
- Tifton @ 73.2
- Blairsville @ 66.2

Fire Ants

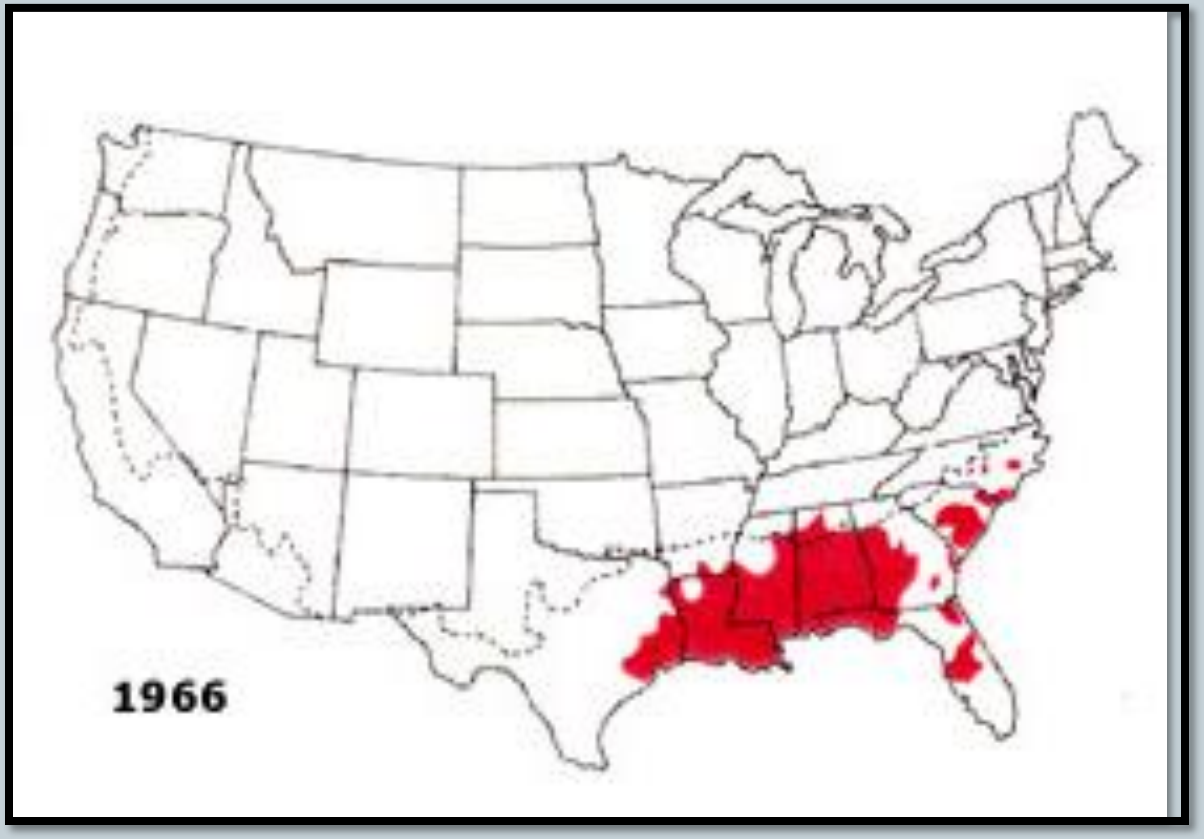
- Ants
  - Fire Ant (*Solenopsis spp.*)
    - Imported fire ant

Fire Ant Introduction

- Ants
  - Fire Ants
    - Distribution
      - 1918
        - Mobile, AL

Fire Ant Distribution

- Ants
  - Fire Ants
    - Distribution



- Ants
  - Fire Ants
    - Distribution

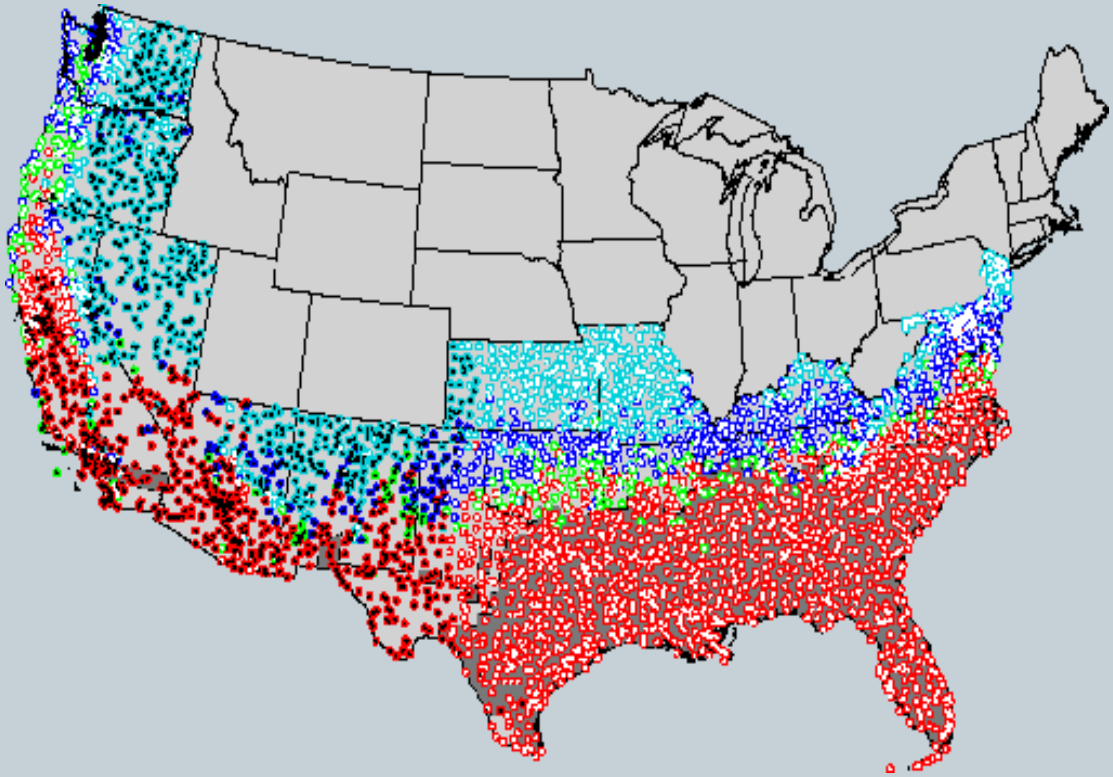
- Ants
  - Fire Ants
    - Distribution

Fire Ant Distribution 2010

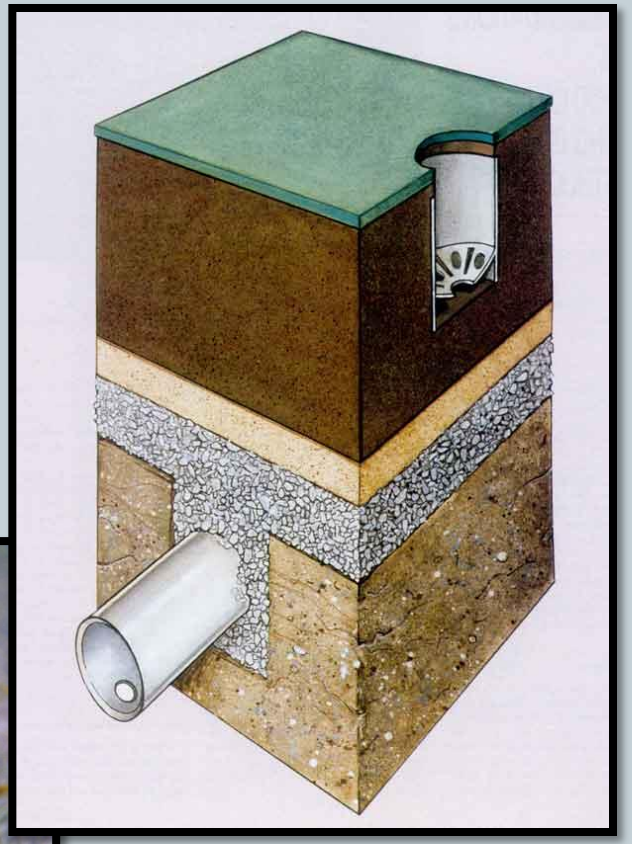
- Ants
  - Fire Ants
    - Distribution
      - 2010

Future

- Ants
  - Fire Ants
    - Distribution



- Ants
  - Fire Ants prefer…
    - Sunny locations
    - Dry soil
    - Short grass
      - USGA sand-based putting green



- Ants
  - Fire Ants
    - Do not feed on turf
    - Disrupt the playing surface
    - Eye sore
    - Stinging/biting insect

- Ants
  - Fire Ants eat
    - Scavenge
    - Insects
    - Seeds
    - Carrion

- Ants
  - Fire Ants
    - The nest
      - 2 ft nest
      - 3-4 ft into the soil
      - 100,000 to 500,000 workers
      - Winged adults
      - Egg-laying queen
      - Brood (larvae)

- Ants
  - Fire Ants
    - A mature nest
      - 2,000 new queens/year
    - New colonies
      - Established in spring and summer

Building an army

- Fire ants
  - How a cast system starts
    - Winged female
      - Fertile female
    - Fertilized by winged male
      - Drones
    - Fertilized female
      - Losses her wings
        - Digs a hole and starts colony

Building an army

- Fertilized Queen
  - Princesses
    - Fertile sisters (clones)
      - Make new colonies
  - Drones (males)
    - Make new colonies
  - Workers (females)
    - Sterile little ants
  - Soldiers (females)
    - Sterile big ants
      - Large mandibles

Building an army

- Queen can sense the population dynamics
  - Pheromones
    - Workers are low
      - Make more workers
    - Soldiers are low
      - Make more soldiers

- If the queen dies, her pheromones production stops
  - If a princess is around, she takes over
  - Hormones in larva change
    - Hatches into a fertile female

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2015
Turfgrass Pest Control
Recommendations for Professionals

Calendars

Formulations

Tank mixing

Evaluation and application forms

Insect pests

Insect control

Insecticide site usage

General Information

Not all turfgrass sites are created equal. It is important to read the label on the product before purchasing an insecticide for a particular site use. An insecticide may not be labeled for all turfgrass uses (e.g., lawns, athletic field, sod farms, or golf course). Some products are only labeled for use on golf courses or sod farms. For example, Dursban 50W (chlorpyrifos) is not labeled for use on residential or commercial lawns. Furthermore, Orthene (acephate) formulations are labeled for use against fire ants in residential and commercial lawns, but not other pests.

If product restrictions are noted on the label, they may appear as a note next to the product names in this publication. For example, when you read, "landscape turf only" that product is not available for use on golf course or sod farms. When a product labeled for these other sites is available it is included but it may not have any restrictions noted. If no restrictions are noted, the product is likely labeled for general use on turfgrass or on all turfgrass sites. The label on your individual product may vary from the online version of the manufacturer's labels, therefore abide by all restrictions on the product label if they differ from those presented in this guide.

Restricted Use Pesticides (RUPs), those that only a certified pesticide applicator may use, supervise the use of, or purchase, will be noted. Uncertified pesticide applicators may not purchase, use or supervise the use of these products.

Protection of pollinators: Managed landscapes often contain flowering plants and can be important foraging sites for bees and other pollinators. Many insecticides are extremely toxic to bees, and others can affect colony health with repeated exposure. Use extreme care when applying insecticides to flowering plants, including turfgrasses. The neonicotinyl insecticides (IRAC group 4A) have systemic activity and can move to pollen and nectar if applied to plants in bloom. If there are flowering weeds, such as clover, in the turf the blossoms should be mowed before application of this class of insecticide. Read and follow all restrictions on the labels, as there have been changes made recently to neonicotinyl use instructions.

Imported Fire Ants/Ants

Control Options

- Bait Treatments
- Mound Drench Treatments
- Dry Mound Treatments
- Broadcast Treatments

Imported Fire Ants/Ants

PESTS	INSECTICIDE AND FORMULATION	IRAC GROUP	RATE	PHI*/REI* (Hours or Days)	REMARKS AND PRECAUTIONS
Imported Fire Ants/ Ants	**BAIT TREATMENTS**				The most effective method for control of ants over a broad area is the use of a broadcast bait two times per year (spring/fall) coupled with individual mound treatments as needed. **Broadcast Bait Treatments** Broadcast baits when ants are actively foraging for food (typically, warm, dry days in spring and fall). Some baits work within 48 hrs., some may take a month. Avoid applying baits just before or after irrigation or rain. **Individual Mound Treatments** **Do not disturb mounds before treatment.** *Drenches:* Drench mounds when queen and brood are located close to soil surface on warm, dry days. Generally, it takes 1-2 gallons of water to drench a fire ant mound effectively. *Granules:* Scatter granules around the edge of the nest, not on top. *Dusts:* Dust evenly over top mound.
	indoxacarb Advion	22A	4 Tbps/mound or 1.5 lb/A		
	hydromethylnon Amdro	20A	5 Tbps/mound or 1-1.5 lb/A		
	MOUND DRENCH TREATMENTS				
	acephate Orthene TTO 75WP Orthene TTO 97	1B	1 oz./5 gal. 0.75 oz./5 gal.	24 H	
	bifenthrin Talstar GC Flowable	3A	1 tsp./gal.	12 H	
	carbaryl Sevin SL	1A	0.75 fl. oz./gal	12 H	
	chlorpyrifos Dursban 50W (golf course & sod farms only) Dursban Pro	1B	**RUP** 0.24 oz./gal. 1 fl. oz./2 gal.	24H	
	deltamethrin DeltaGard GC 5SC	3A	1.5 fl. oz./gal.		
	imidacloprid + bifenthrin Allectus GC SC (golf course and sod farms only) Allectus SC (landscape turf only)	4A + 3A	0.33 fl. oz./gal. 0.33 fl. oz./gal.	12H	
	lambda-cyhalothrin Scrimtar CS (landscape turf only)	3A	0.5 fl. oz./gal.		
	permethrin Astro (landscape turf only)	3A	1.6 fl. oz./gal.		
	spinosad Conserve		0.1 fl. oz./gal.	4H	

Imported Fire Ants/Ants

INSECT CONTROL IN COMMERCIAL TURF (continued)					
PESTS	**INSECTICIDE AND FORMULATION**	**IRAC GROUP**	**RATE**	**PHI*/REI* (Hours or Days)**	**REMARKS AND PRECAUTIONS**
Imported Fire Ants/ Ants	**DRY MOUND TREATMENT**				
	acephate Orthene TTO 75WP	1B	1-2 tsp./mound		
	cyfluthrin Bayer Fire Ant Killer	3A	1 tsp./mound		
	deltamethrin Bengal Ultra Dust Fire Ant Killer 0.05% Terro Fire Ant Killer 0.05% DeltaGard G (landscape turf only)	3A	1 Tbsp./mound 1 Tbsp./mound 2 Tbsp./mound		
	imidacloprid + bifenthrin Allectus GC (golf course & sod farms only) Allectus G (landscape turf only)	4A + 3A	4 oz./mound 4 oz./mound	12H	

Imported Fire Ants/Ants

BROADCAST TREATMENTS			
bifenthrin Talstar GC Flowable Talstar EZ Golf Granular	3A	 0.5 fl. oz./1,000 ft^2 2.3-4.6 lbs. /1,000ft^2	12H
carbaryl Sevin SL	1A	 3 fl. oz./1,000ft^2	12H
chlorpyrifos Dursban 50W (golf course & sod farms only) Dursban Pro	1B	**RUP** 16 lbs./acre 1.5 fl. oz./1,000ft^2	24H
cyfluthrin Tempo SC Ultra (landscape turf only) Tempo WP Ultra (landscape turf only) Tempo WP GC (golf course only)	3A	8 ml/1,000ft^2 5-10g (1-2 scoops)/ 1,000ft^2 1 packet/7,800ft^2	
deltamethrin DeltaGard GC 5SC DeltaGard T&O 5SC (landscape turf only) DeltaGard G (landscape turf only)	3A	 1.5 fl. oz./gal. 1.5 fl. oz./gal. 1.5 fl. oz./gal.	
Fipronil 0.01% Chipco TopChoice	2B	 2 lbs./1,000ft^2	24H
imidacloprid + bifinthrin Allectus GC SC Allectus SC (landscape turf only) Allectus GC Allectus G (landscape turf only)	4A+3A	 1.32-1.65 fl. oz./1,000ft^2 1.32-1.65 fl. oz./1,000ft^2 1.7-2.9 lbs./1,000ft^2 1.7-2.9 lbs./1,000ft^2	12H
lambda cyhalothrin Scimitar CS (landscape turf only) Scimitar GC	3A	 7 ml./ 1,000ft^2 7 ml./ 1,000ft^2	

Mole Crickets

- Mole crickets
  - Tawny (*Scapteriscus vicinus*)
  - Southern (*Scapteriscus borellii*)
  - Short-winged (*Scapteriscus abbreviatus*)
  - Northern (*Neocurtilla hexadactyla*)

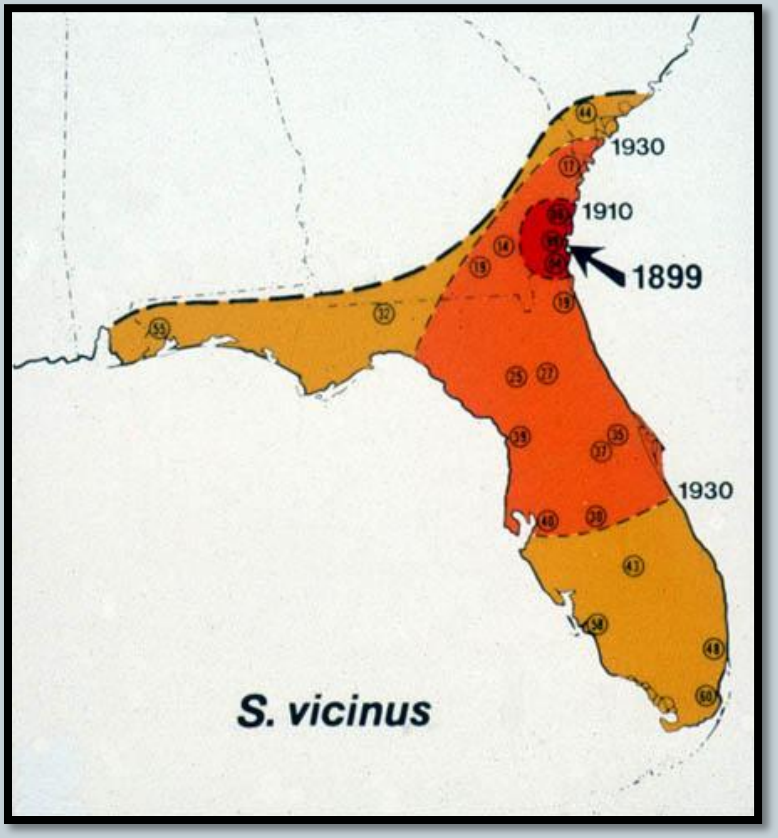
- Mole crickets
  - Tawny (*Scapteriscus vicinus*)
  - Southern (*Scapteriscus borellii*)
    - Most destructive in the U.S.A
      - Introduced into U.S. 1900
        - From South America

Tawny mole cricket

Southern mole cricket

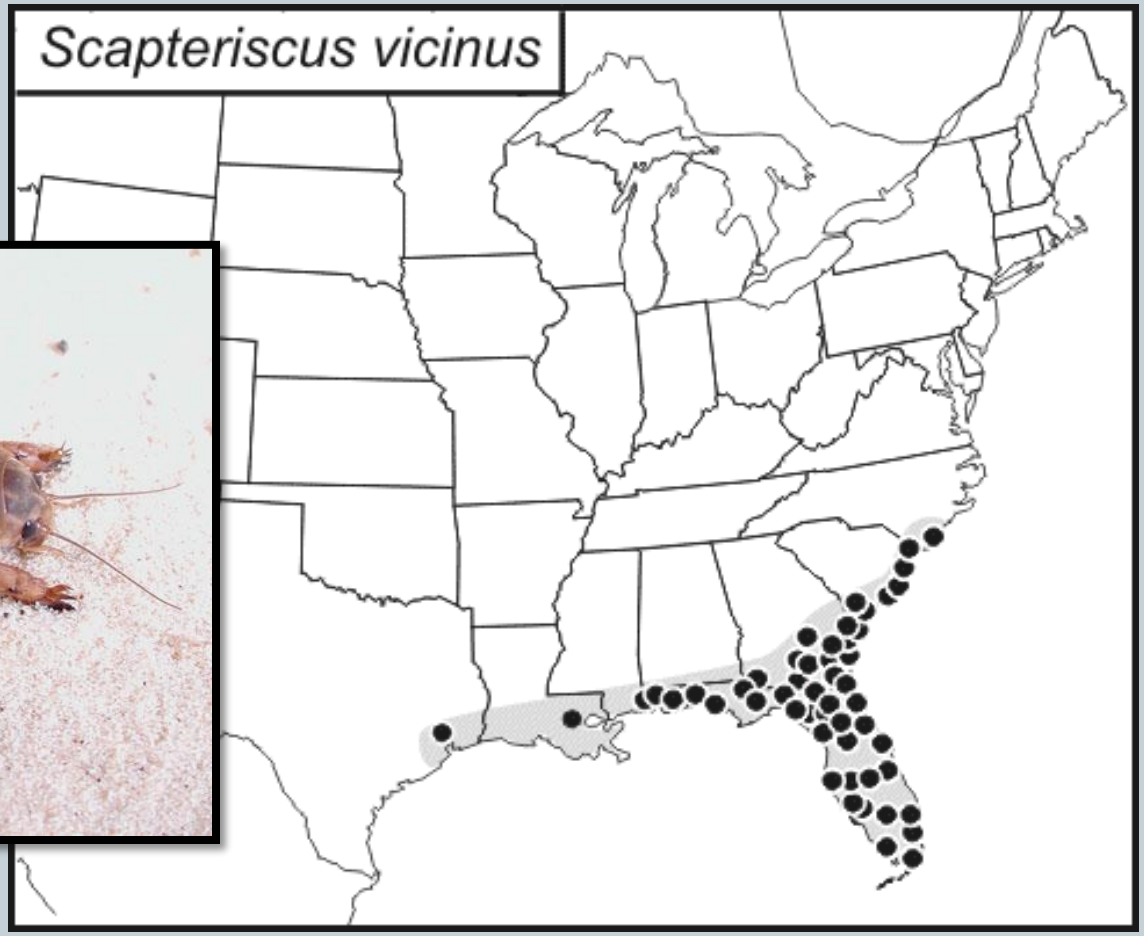
Tawny

- Mole crickets
  - Tawny (*Scapteriscus vicinus*)



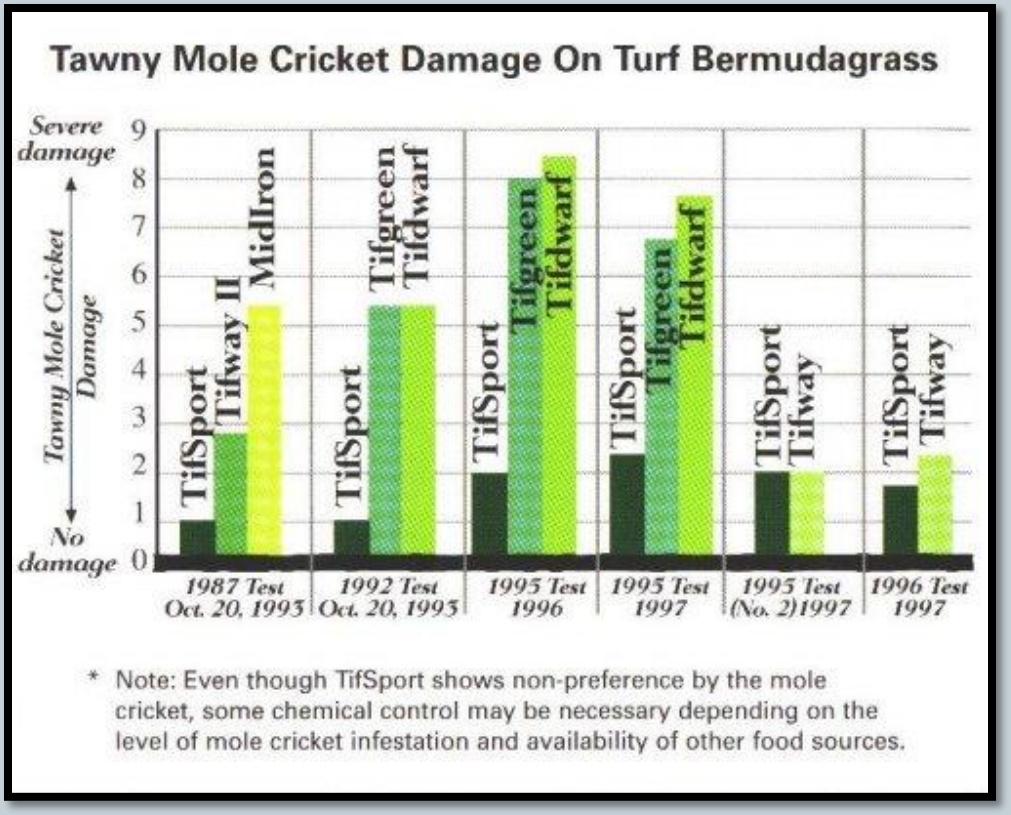
Tawny

- Mole crickets
  - Tawny



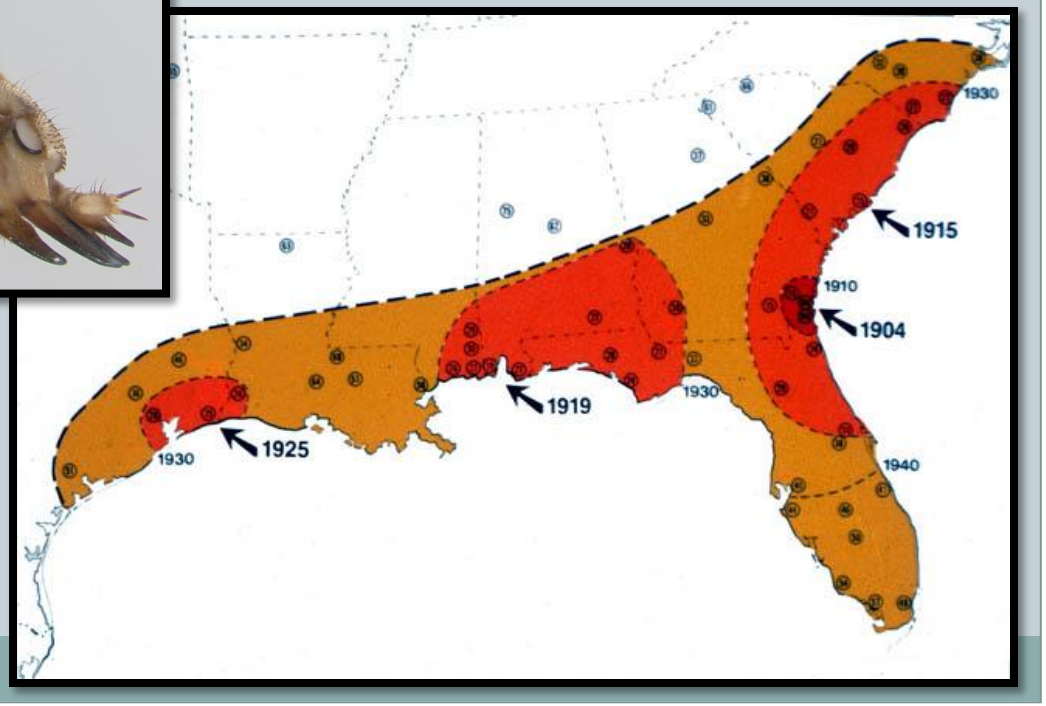
Tawny

- Mole crickets
  - Tawny mole cricket may be host specific…



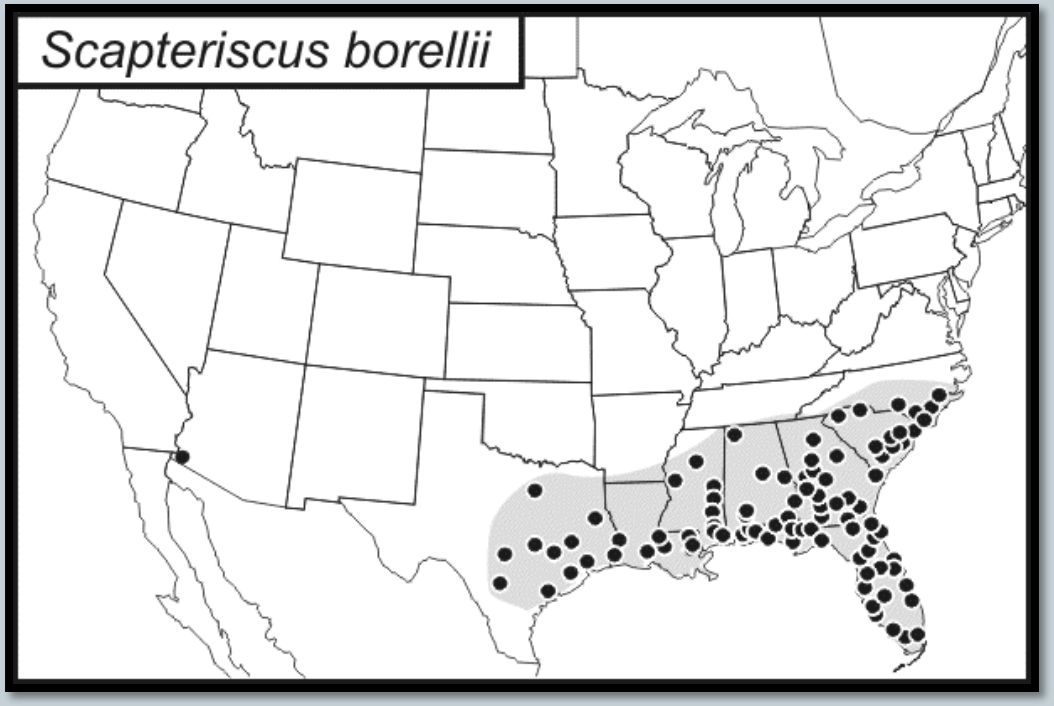
Southern

- Mole crickets
  - Southern (*Scapteriscus borellii*)



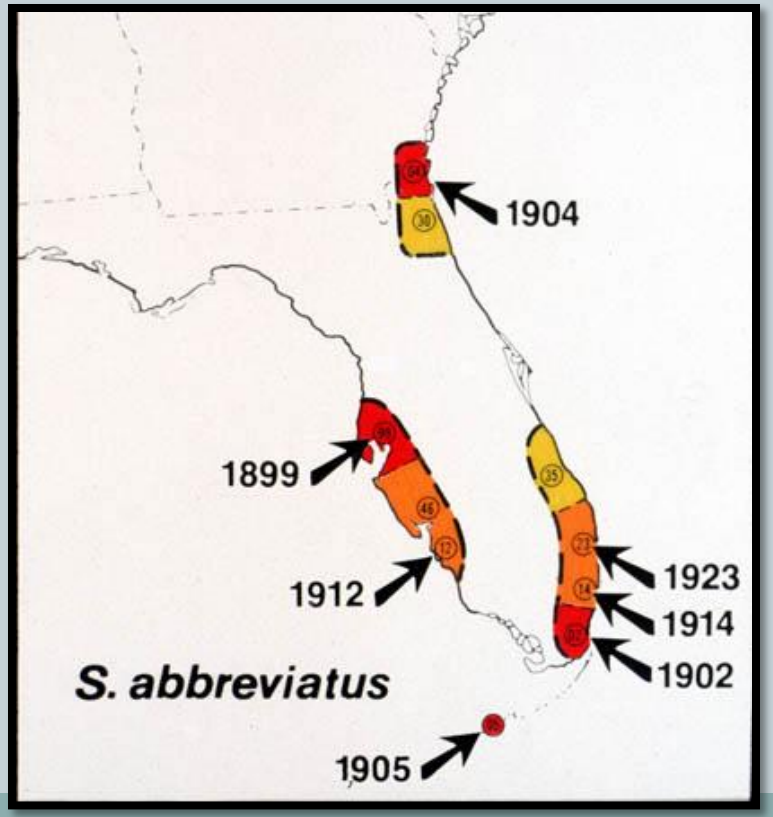
Southern

- Mole crickets
  - Southern



Short-winged

- Mole crickets
  - Short-winged (*Scapteriscus abbreviatus*)
    - Incapable of flight
      - Localized populations
        - Southeastern Florida

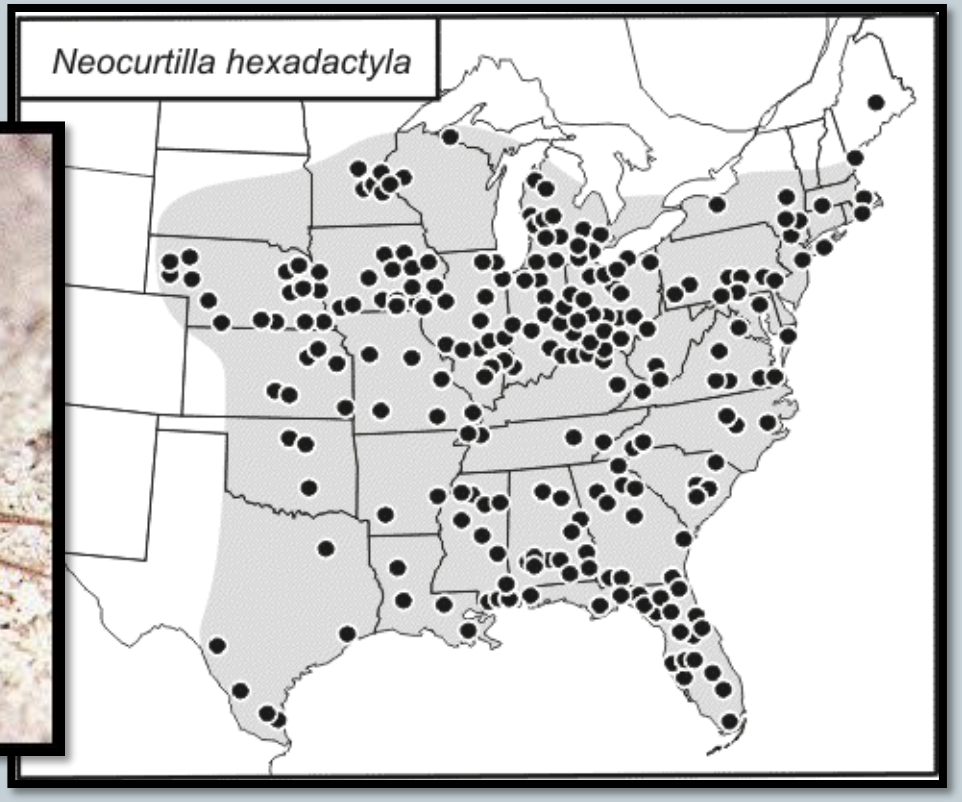


Short-winged

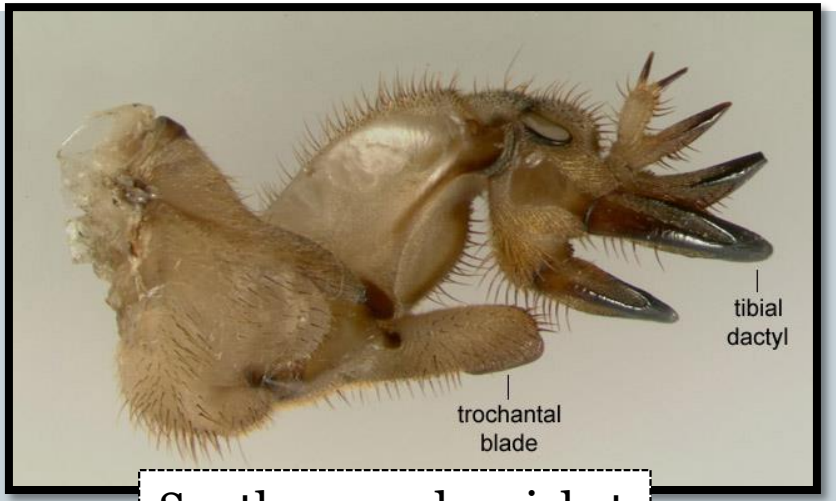
- Mole crickets
  - Short-winged

Northern

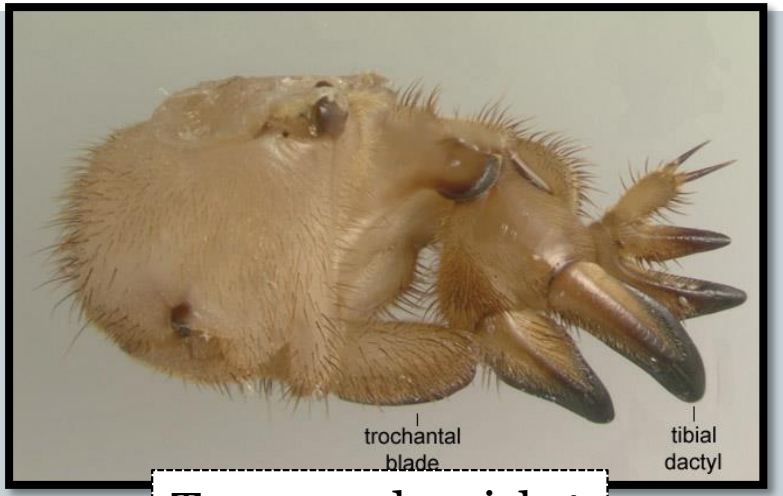
- Mole crickets
  - Northern (*Neocurtilla hexadactyla*)



Mole Crickets



Southern mole cricket



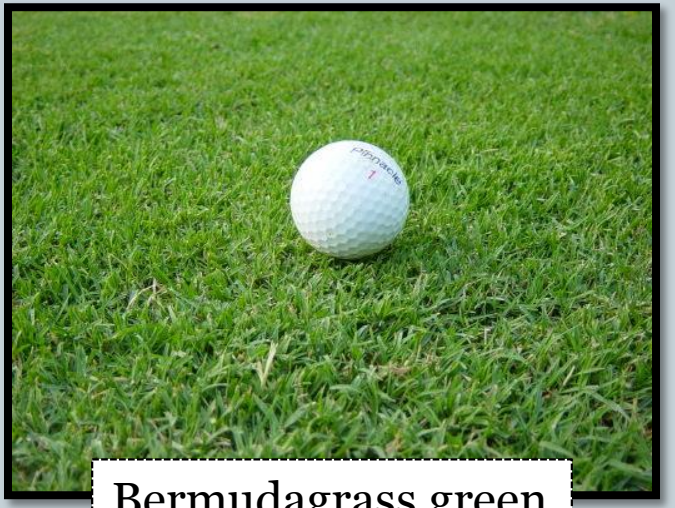
Tawny mole cricket

Short-winged mole cricket

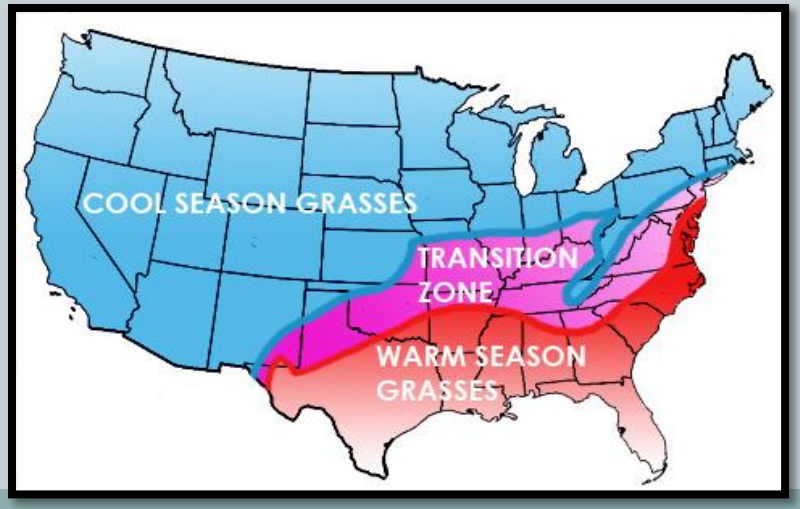
Northern mole cricket

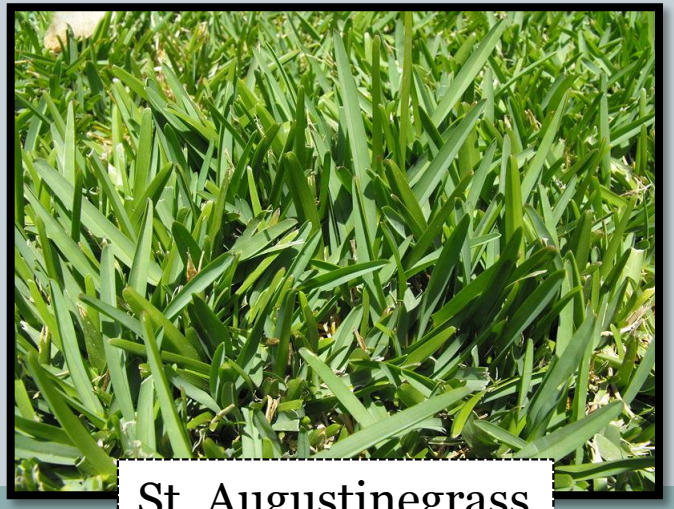
Mole Crickets

- Mole crickets
  - Preferred plants
    - Bermudagrass
    - Bahiagrass
    - St. Augustinegrass
    - Centipede



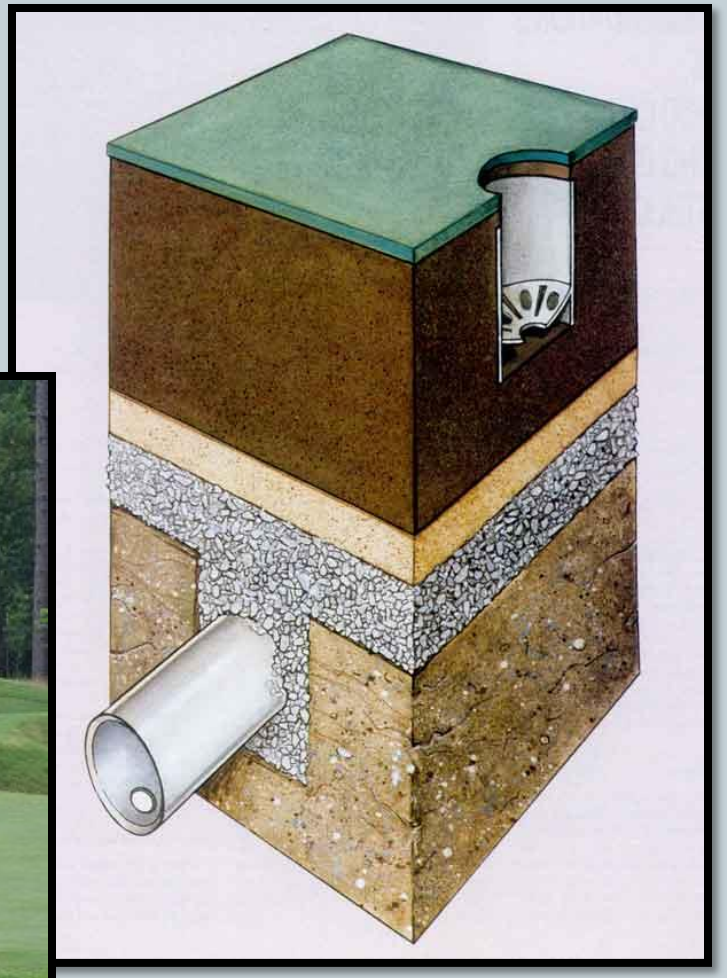
Bermudagrass green





St. Augustinegrass

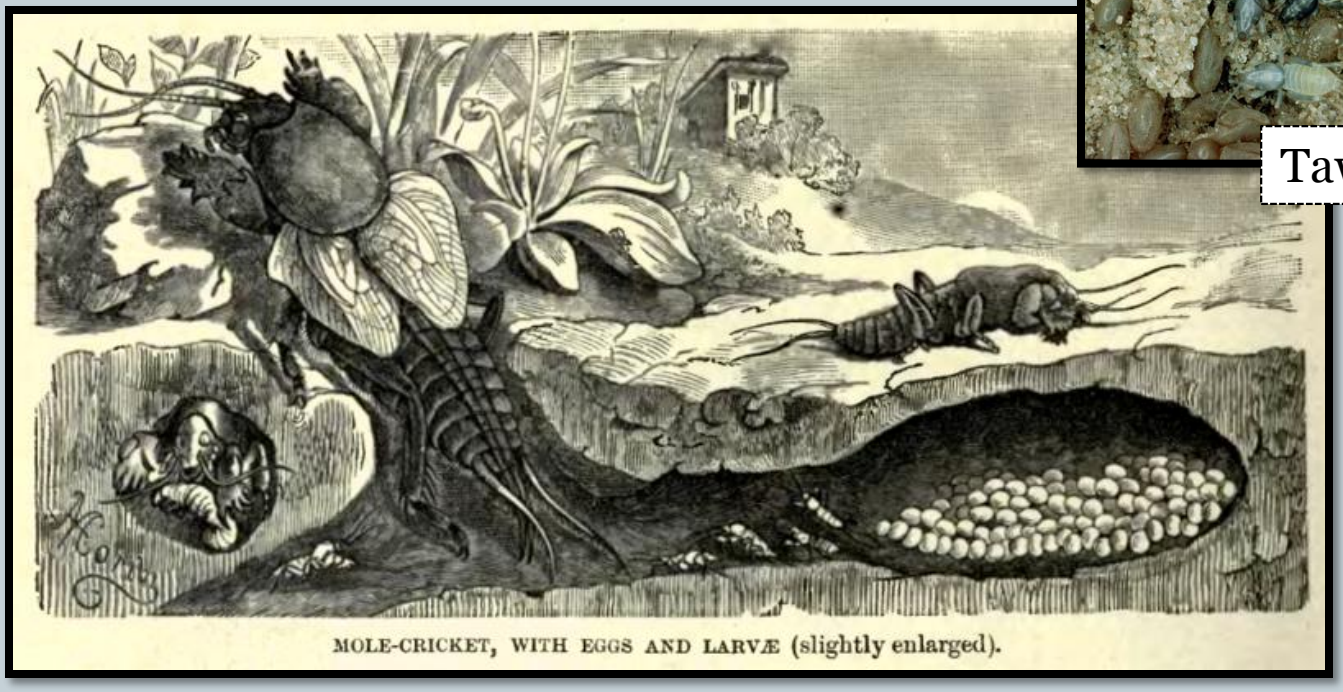
- Mole crickets
  - Preferred soils
    - Sandy soil
    - Dry soil



Life Cycle

- Mole crickets
  - Life cycle spent underground
    - Destructive stages: nymph and adult

Tawny nymphs



MOLE-CRICKET, WITH EGGS AND LARVÆ (slightly enlarged).

Life Cycle

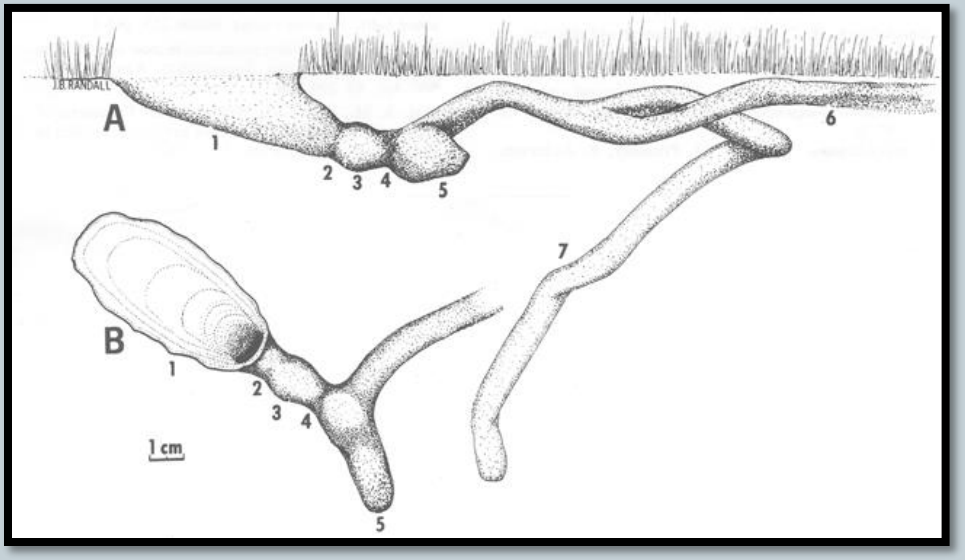
- Mole crickets
  - Tawny and Southern mole cricket life cycle

May/June ⟷ Aug./Sept. Sep. – May

Nymph ⟶ Adult

Damage

- Mole crickets
  - Damage
    - Borrowing and tunneling
    - Feeding (herbivores)
      - Tawny
      - Short-winged
      - Northern



- Mole crickets
  - Damage
    - Borrowing and tunneling
      - Southern
        - Carnivorous

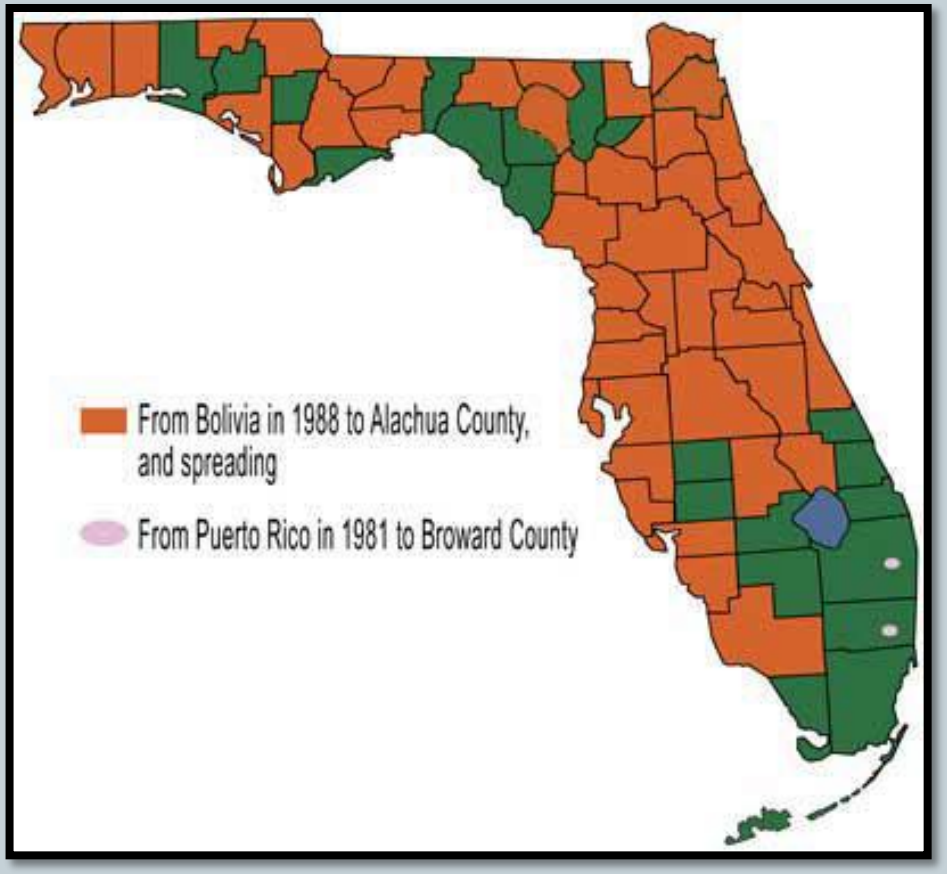
Predators of Mole Crickets

- Mole crickets
  - Damage
    - Multiplied by digging predators

Skunk damage

- Mole crickets
  - Biological control
    - Crabronid wasp
      - Parasitic wasp

- Mole crickets
  - Biological control
    - Crabronid wasp
      - Attacks *Scapteriscus* spp.
        - Tawny
        - Southern
        - Short-winged
- Introduced from Bolivia
  - Spreading across Florida



- Mole crickets
  - Current range of the crabronid wasp

- Mole crickets
  - Wild flower *Spermacoce verticillata*
    - Attracts crabronid wasp

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Mole Crickets

Mole Crickets

Identification Mole crickets are light brown, up to 1 ½ inches long, have short, stout forelegs, spade-like feet, and large eyes. The young resemble the adults except that they are much smaller, have no wings, and are sexually immature. Three species occur in Georgia. Two, the tawny mole cricket and the southern mole cricket, are pest species. Mole crickets occur primarily in the sandy soils of the Coastal Plain.

Life Cycle and Biology Adults lay eggs in underground cells in the spring. The eggs hatch in two to four weeks, depending on the weather. Nymphs feed and grow through the summer and mature into adults in the late fall or winter. Mole crickets spend the winter deep in the soil, but come to the surface to feed during warm periods. Adult crickets leave the soil on warm spring nights to fly around, sometimes in huge numbers, looking for mates and egg-laying sites. There is one generation per year, and most adults die by early summer. Tawny mole cricket mating flights occur in March and early April; southern mole cricket flights occur in April and in early May. Cold or wet spring weather may delay flights.

Damage The most damaging species of mole crickets feed on grass. Other species don't feed directly on grass, but their tunneling activity damages turf. Both young and adults burrow beneath the soil and make tunnels similar to, but much smaller than, those made by moles. This loosens the soil and causes it to dry out quickly. It also clips the roots of the grass plants. Left unchecked, mole crickets will build up in an area and completely destroy the grass, leaving bare ground.

Control Strategies Insecticidal control of mole crickets is most effective in summer (late June or early July) when most of the mole cricket eggs have hatched and nymphs are still small. Granular or spray insecticides are the formulations of choice for summer application. In late summer, mole cricket baits or insecticides with longer residual activity will be more effective. Effective control in spring and fall is difficult because of unpredictable weather, cricket activity, and their large dispersal flights. At these times of year, treat only severely damaged areas where grass is dying out. Spot treat with an appropriate insecticide. Bait formulations are most effective in spring and fall.

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Mole Crickets	acephate Orthene TTO 75WP Orthene TTO 97 (golf course & sod farm only)	1B	1-1.9 oz./1,000ft^2 0.8-1.4 oz./1,000ft^2	24H
	bifenthrin Talstar GC Flowable Talstar GC Granular	3A	0.25-0.5 fl. oz./1,000ft^2 2.3-4.6 lbs./1,000ft^2	12H
	carbaryl Mole Cricket Bait	1A	0.75-0.9 lb./1,000ft^2	12
	clothianidin Arena 50 WDG Aloft LC SC	4A	Suppression only 10.67 oz./acre 11.65-23.3 oz./acre	12
	cyfluthrin Tempo WP Ultra Tempo SC Ultra	3A	7.7-15.4 oz./acre 8mL/1,000ft^2 12 fl. oz./A	
	deltamethrin DeltaGard GC 5SC DeltaGard T&O Granular (landscape turf only)	3A	0.6-0.9 fl. oz./1,000ft^2 2-3 lbs./1,000ft^2	
	fipronil Chipco Topchoice	2B	2 lbs./1,000ft^2	24H
	imidacloprid Merit 75 WSP Merit 0.5G (not for sod farms)	4A	1.6 oz./8,250 ft^2 1.8 lbs./1,000ft^2	12H
	lambda-cyhalothrin Scimitar CS (landscape turf only) Scimitar GC	3A	Nymphs: 7mL/1,000ft^2 Adults: 14mL/1,000ft^2	
	Orthene TTO 97 (golf course & sod farm only)	1B	0.8-1.4 oz./1,000ft^2	24H
	permethrin Astro (landscape turf only)	3A	1.6 fl. oz./gal.	
	trichlorfon Dylox 80 T&O Dylox 6.2 G	1B	3.75 oz./1,000ft^2 3 lbs./1,000ft^2	

Best results with early instar nymphs.

Fipornil is a widely used insecticide that has proven to be the most effective and most expensive single application approach. Since it provides season long control the economics must be considered in that context.

Indoxacarb, acephate, the bifenthrin + imidacloprid combination and chlorpyrifos baits are available for use against larger nymphs in late summer.

The pyrethroids and imidacloprid are less effective, particularly on larger nymphs and adults. Imidacloprid should be applied at or just before egg hatch.

Clothianidin less susceptible to photodegradation than imidacloprid.

For most treatments irrigate 24 hrs. before treatment if soil is dry. Apply in late afternoon to dry turf.

Apply during late afternoon or early evening hours and after irrigation. Do not irrigate after application.

The use of a lemon fragrance substance in the spray mix may enhance control by acting as a flushing agent and thus provide increased mole cricket contact with the acephate. The following lemon-scented products have been shown to be effective flushing agents: Lemon Joy, Lemon Palmolive, and Mighty Products manufactured-base pure lemon fragrance. The use rate for these lemon-scented products is 2 teaspoons per gallon of water for small total mix volume or 6 fl. oz. per 50 gallons of water for large mix volume.