












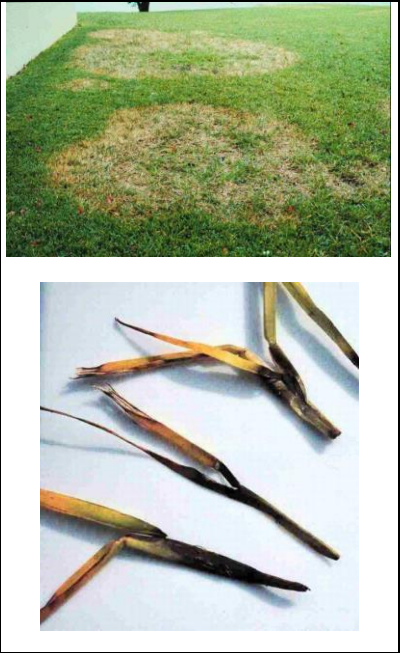

Diagnosing Insect and Disease Problems in Florida Turfgrass

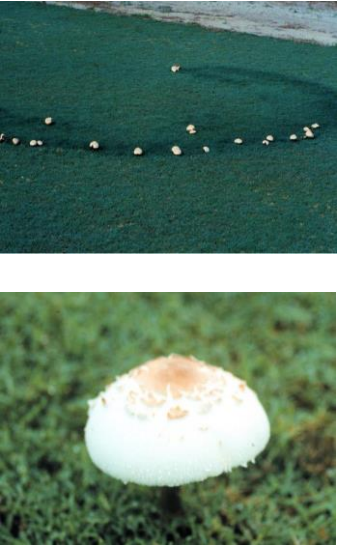

This key is intended to be a starting point for identifying Florida turfgrass insect pests and diseases. Contact your local county Extension office for further information, including management recommendations.


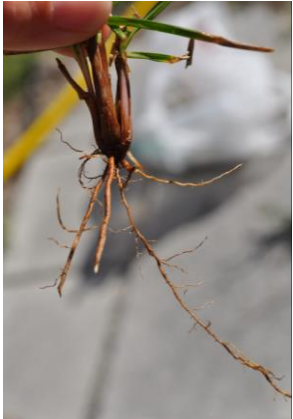
Insect	Species	Identification	Occurrence	Damage/Monitoring	Photo
Caterpillars	Tropical Sod Webworm (TSW)	Caterpillars are gray-green, and have brown spots on each segment. Mature larvae are ¾ to 1 inch long.	Tropical sod webworm larvae feed on all warm-season turfgrasses. Most active from April through November in north Florida, but may occur year-round in south Florida.	Caterpillars injure grass by chewing notches along the leaves, creating a ragged appearance. Mature larvae consume most of the grass blade. To find larvae, part the grass in suspect areas and look for chewed leaves, frass, and larvae. A soap flush (mixing 1-2 gallons of water with 1-2 TBSP of dish soap) poured over the infested turf will make them emerge quickly. If nothing emerges, examine several other areas.	
	Fall Armyworm (FAW)	Caterpillars can be green or brown, up to 1½ inches long with four pairs of fleshy prolegs on the abdomen. Larvae have light stripes along the length of the body, dark spots on top of each segment, and an inverted light-colored 'Y' on the front of their head.	Fall armyworm will feed on all turfgrasses, but prefers Bermuda grass. Fall armyworm populations occur year-round in south Florida but don't build up until fall in north Florida.	Most turfgrasses can tolerate the notching damage that young larvae cause, but 3 mature FAW or SGP larvae per square foot may justify treatment. About 10 to 15 TSW could warrant treatment. Large larvae pupate quickly however, possibly making insecticides unnecessary.	
	Striped Grass Looper (SGL)	Caterpillars have a long, thin body with two pairs of fleshy prolegs, and "loop" like inchworms when crawling. Their color ranges from cream to black, with a light-colored narrow stripe down their backs, and many stripes on their heads.	Striped grass looper is primarily a pest on Bahiagrass in pastures, but will readily infest other turfgrasses. Striped grass looper occurs year-round in south Florida, and isn't a problem until fall in north Florida.		

Insect	Turfgrass Affected	Occurrence/Damage	Identification	Monitoring	Photo
<p align="center">Chinch Bugs</p>	<p>Prefers St. Augustine</p> <p>Can also feed on Bermuda, Bahia, Centipede, and Zoysia, but damage is not usually severe.</p>	<p>Southern chinch bug activity occurs from March through November in north-central Florida and is year-round in southern Florida.</p> <p>Nymphs and adults feed on plant fluids within leaf sheaths, down in the thatch, and this feeding kills the grass plants and contributes to weed invasion.</p> <p>Use the monitoring techniques listed to examine several different areas if chinch bug damage is suspected.</p>	<p>Several insects can be confused with chinch bugs, so proper insect identification is important.</p> <p>Adult chinch bugs (top photo) are about 1/8 to 1/10 of an inch long; wings (long or short) are folded flat on the back and are shiny white with a triangular-shaped black marking in the middle of the outer edge of each wing; bodies are black.</p> <p>Tiny eggs are laid singly or a few at a time in leaf sheaths, soft soil, or other protected areas. The eggs are white when first laid and turn bright orange or red just before hatching.</p> <p>Young nymphs (bottom photo) are reddish-orange with a white band across the back, darken in color as they mature, and turn black before becoming adults.</p>	<p>Insects are most active on warm, sunny days in mid-afternoon. Several methods can be used to find chinch bugs:</p> <p>1 - Part the grass near yellowed areas and look at the soil surface and thatch. Pull out individual grass plants and look inside the bottom leaf sheath.</p> <p>2 - Use a Dust Buster or hand-held vacuum to suck up any chinch bugs near damaged areas. Remove the filter, empty the contents on the sidewalk or in a bucket, and look for nymphs and adults.</p> <p>3 - A flotation technique can also be used to detect infestations. Cut both ends out of a metal can and push one end 2-3 inches into the soil on green or yellowing grass. Slowly fill with water and count the number of chinch bugs that float to the top within 5 minutes. Keep the water level above the grass surface.</p>	 

Insect	Turfgrass Affected	Occurrence/Damage	Monitoring	Photo
Grubs	Most warm-season turfgrasses are affected by one grub species or another	<p>Depending on the grub species, damage from grubs may peak during the summer and fall months, continue into winter, or occur year-round.</p> <p>Grubs feed on grass roots; the grass gradually thins, yellows, and dies. Grass may feel soft and spongy. Scattered, irregular, brown patches of grass appear which increase in size over time. The root injury reduces the turf's ability to take up water and nutrients and withstand drought stress. Heavily infested grass pulls up easily.</p>	<p>Use a shovel to sift through the top 3 inches of soil, roots, and thatch. Look for creamy-white, C-shaped beetle larvae (¼ to 2 inches), with tan to rusty-brown heads and six legs. Afterwards, replace the grass and water it.</p> <p>***Finding a few grubs is not cause for alarm. Damage thresholds vary with grub species and turf quality.</p>	 
Mole Crickets	Bahia, Bermuda, St. Augustine (commonly injured) Centipede & Zoysia (infrequent injury)	<p>Typically, the eggs are deposited in April-May, and juveniles (called nymphs) predominate through August. Beginning in August or September some adults can be found, but both nymphs and adults can overwinter.</p> <p>The crickets damage turfgrasses, vegetable seedlings, and even some weeds, feeding aboveground on foliage or stem tissue, and belowground on roots and tubers.</p> <p>Soil surface tunneling may or may not be evident; a soap flush will confirm an infestation.</p>	<p>Conduct a soap flush, mixing 2 TBSP of lemon dishwashing soap with water in a 2 gallon sprinkling can. Pour over a 4 square foot area near the damage and see what emerges within 3 minutes. Check several places in the lawn; consider control if more than 2 to 4 crickets is found per square foot.</p>	 
Spittlebugs	All turfgrasses; Centipede is the most susceptible	<p>Occur spring through fall; both adults and nymphs suck juices from the grass; grass may wilt, turn yellow/brown, and then curl. In St. Augustine, spittlebug injury resembles that of chinch bugs. However, unlike chinch bug injury, which tends to occur in sunny areas, spittlebug injury usually appears in shady areas.</p> <p>Adults have red eyes and legs and have two orange stripes across their wings. Nymphs are yellow or cream colored, but are surrounded by a mass of white frothy spittle.</p>	<p>Look for purple and/or white stripes along the grass blades (especially centipede).</p> <p>Look for masses of spittle and adult insects.</p>	 

Disease	Turfgrass Affected	Occurrence	Symptoms/Signs	Other Notes	Photo
Brown Patch	All warm-season turf grasses, especially St. Augustine & Zoysia	<p>Most likely to occur November to May when temperatures are below 80°F. Infection is triggered by rainfall, excessive irrigation, or extended periods of high humidity resulting in the leaves being continuously wet for 48 hours or more.</p>	<p>The fungus infects the leaf area closest to the soil, eventually killing the leaf. A soft, dark rot occurs at the base of the leaf, and leaves can easily be pulled off the stem. The base of a pulled leaf has a rotted odor. Roots are not affected.</p> <p>Usually begins as small patches that turn yellow and then reddish brown/brown as leaves die. Patches can expand to several feet in diameter; not uncommon to see rings of yellow/brown turf with apparently healthy turf in the center.</p>	<p>This disease is often confused with herbicide damage on St. Augustine.</p> <p>Herbicide damage may cause the same overall symptoms of yellow or brown patches. The leaf may still pull out of the leaf sheath, but the base of the leaf is not dark and rotted. Instead, the leaf base is dry with a tan discoloration, and there is no distinct smell of rot.</p>	
Dollar Spot	All warm-season turf grasses, especially Bahia & Bermuda	<p>Occurs during mild to cool weather that is accompanied by frequent and prolonged moisture from dew or cloudy, rainy periods. Temperatures of 70° to 80°F are optimum for the disease.</p>	<p>Small circular patches (2-3 inches in diameter) may coalesce into larger, irregular, dead areas.</p> <p>Individual leaves have lesions that usually begin at the leaf margin or folded edge of the leaf blade. The spot is tan in color, bordered by a narrow, dark brown to purple zone.</p> <p>During prolonged wet periods, especially in early morning, fluffy, gray to white masses of fungal threads can be seen in the patches.</p>	<p>Turfgrass that is drought-stressed, excessively irrigated, subjected to low mowing heights, and/or has excessive thatch buildup will be more prone to dollar spot.</p> <p>The white masses of fungal threads are sometimes confused with fine spider webs.</p>	

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<p>Fairy Rings</p>	<p>All warm-season turf grasses</p>	<p>Fairy rings, especially the mushrooms, are commonly observed during the summer months. Occurs when large quantities of organic matter, such as lumber or tree stumps are naturally located or have been buried in a lawn. The fungi develop on this material.</p>	<p>There are three types of fairy rings:</p> <p>Type I rings have a zone of dead grass just inside a zone of dark green grass. Weeds often invade the dead zone.</p> <p>Type II rings only have a band of dark green turf (no dead turf). Mushrooms may or may not be present in the band.</p> <p>Type III rings do not exhibit a dead zone or a dark green zone, but a ring of mushrooms is present.</p>	<p>Since some mushrooms are poisonous, they should be removed or destroyed.</p> <p>In some situations, the fungi make the soil hydrophobic (repels water) resulting in rings of dead grass. It is then necessary to aerate or break up the soil under the dead grass (using a pitchfork) and water only the ring daily to rewet the soil.</p>	
<p>Gray Leaf Spot</p>	<p>St. Augustine (primary host) & Centipede</p>	<p>Often observed late spring to early fall, especially during prolonged periods of rainfall.</p>	<p>Initial symptoms include small pinhead-sized spots that are olive green to brown in color. These enlarge and form circular to oblong spots that are tan to brown in color with distinctive dark brown margins. During periods of high humidity, the fungus produces abundant spores in the center of these spots, giving them a velvety-gray appearance.</p> <p>No distinct patches are observed, but areas may appear thin. Severe infestations look similar to drought stress.</p>	<p>Excessive applications of quick-release nitrogen sources enhance disease severity, as does compacted soil. Application of the herbicide atrazine increases the susceptibility of St. Augustine grass to this disease.</p> <p>During the summer, St. Augustine grass always has a few spots, but the overall health of the turfgrass is not affected unless the grass is placed under severe stress.</p>	

Disease	Turfgrass Affected	Occurrence	Symptoms/Signs	Other Notes	Photo
Pythium Blight	Cool-season turfgrasses overseeded as winter cover of warm-season species & Bermuda	Occurs during wet periods and high temperatures. The pathogen can kill seedlings as well as an established turfgrass. Temperatures around 90°F are ideal for disease development.	The first symptoms often include turfgrass with a wilted, greasy, water-soaked, or gray appearance. As disease progresses, the turf will collapse and appear brown and matted, sometimes with a bronze or red tinge to the border of the affected area. Extended periods of high humidity or leaf wetness may result in a white cottony growth of mycelium on symptomatic turf.	Severe disease outbreaks commonly occur on turfgrass sites that are over-irrigated or poorly drained.	
Pythium Root Rot	All warm-season turf grasses	Symptoms may appear at any time of the year, but they are always associated with wet soil conditions, either from excessive rainfall or from irrigation.	The aboveground symptom is typically a nonspecific decline in turf quality. Small or large turf areas become a general yellow, light green or brown color and display thinning. Roots appear thin with few root hairs and have a general discoloration, but are not black and rotted.	This is a root rot disease. The symptoms observed are the result of fungal activity on the root system. Poor drainage conditions compound this problem. Turf seldom dies from the disease and no distinct patches are observed.	
Take-All Root Rot	All warm-season turf grasses	Naturally present on turfgrass roots. High rainfall and stressed turfgrass trigger the disease. Usually observed during the summer and early fall (rainy season).	Initial symptoms aboveground are irregular, yellow or light green patches (from a few inches to a few feet). Roots are initially thin and off-white in color with isolated black lesions. Eventually, roots become very short, black, and rotted. Stolons and rhizomes may also have black lesions and begin to rot creating bare patches.	Any stress placed on the turfgrass can encourage or worsen the disease.	