St. augustinegrass lawns are particularly susceptible to chinch bugs as evidenced here by light spots among the healthier, dark parts of the lawn.

How to Diagnose Turfgrass Problems, Part II

THIS concludes a two-part article, begun last month, on methods of detecting turfgrass ills. Author White bases his recommendations on his experiences in Florida, but the techniques he discusses are useful for turf technicians all across the country. Last month he talked about general diagnosis principles and miscellaneous symptoms. Ed.

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Soils Problems

Soil compaction. Soils often become hard or compacted where traffic is concentrated in certain areas and when they are saturated with water. Compaction causes a shallow root system, poor drainage, puddles and weak grass. During hot, dry weather, these areas may wilt because of the shallow root system. During periods of rainfall or watering, the soil may remain soggy and puddle because of poor drainage. During these periods, scum or algae are often present. Grass in compacted areas is often sparse with many of the stems dead.

Layering. Layering results from improperly mixing soil amendments or top dressing lawns with different types of soil, such as sand, muck, and marl. Because of the different water-holding capacity of the various soil layers, root growth is limited usually to just the top layer.

Buried debris. Often debris, such as pieces of building blocks, lumber, and cement shingles, are buried during construction. Many of these materials, being alkaline, lead to an iron deficiency causing the green to turn yellow. Wilting, too, often occurs because the soil usually dries out rapidly in these spots.

Soil variation. Dry spots, soggy soil, compaction, and differences in growth or color of the turf may be due to variations in soil texture. This condition results when topsoil, fill, or amendments are added to certain lawn areas or the materials are not thoroughly incorporated with the native soil.

Nutritional Symptoms

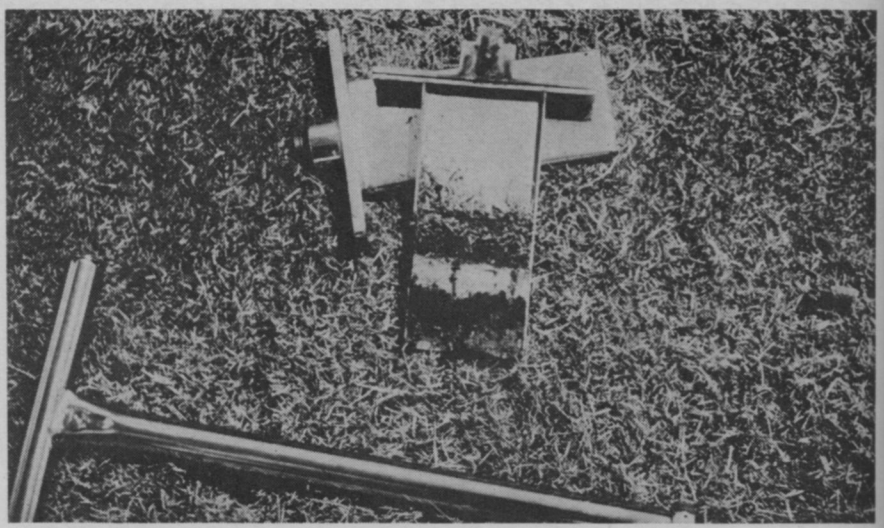
Nitrogen. Nitrogen retention in most Florida soils is very limited. For this reason, nitrogen usually is the first nutrient to become deficient. The older leaves begin turning yellow at the tip and along the leaf margins, and continue until the leaves are entirely yellow and the tips begin dying. The general effect on the entire lawn is a light-green color.

Phosphorus. If the lawn has not received a complete fertilizer for some time, and the leaves and stems develop a reddish-purple color followed by dying of the leaves and a thinning of the turf, there is a possibility of phosphorus deficiency. It should be mentioned, however, that phosphorus deficiency is difficult to diagnose.

Potassium. A shortage of potassium is indicated when leaves

become yellowish with tiny reddish-purple spots similar to gray leafspot on st. augustinegrass, but smaller.

Iron. Iron deficiency usually shows up in distinct areas of the lawn. The new leaves become yellowish while the larger veins in the leaves remain green. Iron deficiencies can result from an alkaline soil situation, a poor or stunted root system, or can be induced by overstimulating the grass with fertilizer when iron is limited in the soil.



Layering, or irregular stratification of soil surface, can be seen by inserting wedge as above. Different layers have different water-holding capacities, which adversely affects root growth.

Insect Symptoms

Chinch bugs. Infestation usually begins in the sunny areas of the lawn near a sidewalk, drive, or house. The grass begins to turn yellowish and then brown in patches. As the population increases, the areas begin to spread and can kill an entire lawn. Each patch has a characteristic dead or brown center with a yellowish margin.

Sod webworms. Damage begins in small patches and, in many cases, in the shady areas around the house. When the population first begins, close inspection of the grass blades reveals the leaves to be chewed along the edges. As this damage continues, the leaves may be completely stripped. In zoysia and bermudagrass, early stages of sod webworm damage are often confused with dollarspot fungus, since little brown areas are formed. Positive identification can be made by parting the grass and looking for small worms in a curled position, or for little green pellets of excrement.

Armyworms. Damage is the same as the tropical sod webworm, but often spreads much faster and usually does not form definite patches.

Rhodesgrass scale. This scale usually causes a slow decline and a thinning of the turf. Infestations often begin in shaded areas. This white, cottony scale attaches itself to the joints of the grass, sucking out the plant juices.

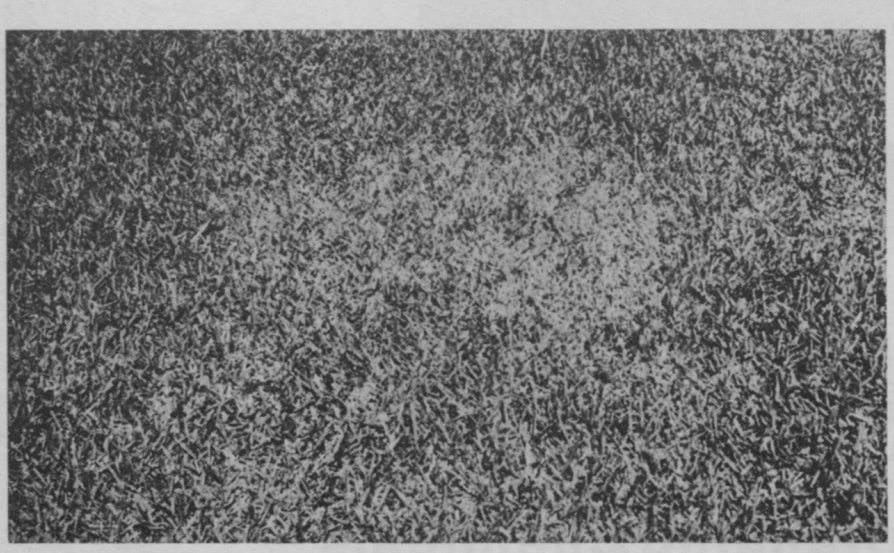
Mole-crickets. These are usually most severe on zoysia and bermudagrass; however, they are destructive on other grasses, especially new plantings. They loosen the soil by forming small tunnels, and cut the roots, thus causing the grass to wilt easily.

Billbugs. These pests are most destructive to zoysiagrass but can also damage other lawn grasses. The first symptoms are small, yellowish, dead areas. The affected grass can be pulled out of the ground with the roots attached. As the damage progresses, the area becomes larger. Localized dry spots are also symptoms. The damage is caused by the young or grub.

Grubs. Feeding on the grass roots, grubs cause yellowish and brownish areas to develop in the turf. The grub is much larger than the billbug larvae.

Wireworms. Wireworms tunnel into stems of the grass and cause yellow-brown spots and wilting. The symptoms often look like brown patch fungus. Wireworms seem more prevalent on centipedegrass.

Bermudagrass mites. Damage to bermudagrass displays a rosette or "witches broom" effect, caused by a shortening of the internodes. Usually these infested areas begin to thin out, and the grass slowly declines. The mite is microscopic, wormlike in shape, with a whitish-cream color. The mites are found under the leaf sheaths and vary in number from a few to hundreds.



Brown patch on st. augustinegrass is common ailment. Note light areas where disease has struck.

Disease, Nematode Symptoms

Brown patch. The grass is affected in circular patches, which may vary in size from a few inches to several feet. The disease is more prevalent during late fall through early spring. However, it can occur at other

Easy way to test for chinch bugs is to insert metal can, with ends cut off, into soil as indicated. Fill with water. If chinch bugs are present, they will work their way to the top of the water in about five minutes.

times of the year. If severe, all blades and stems are killed, but in most cases, some blades and stems go unharmed. Infested blades of the grass usually remain upright but become brown with a water-soaked appearance.

Dollarspot. Diseased areas are usually bleached spots two to three inches in diameter. Lesions can be seen on the leaves of the grass surrounding the bleached spot. The spots may coalesce into larger areas. Dollarspot seems to be most prevalent on zoysiagrass and bermudagrass.

Pythium. Pythium primarily attacks bermudagrass. The affected areas are usually in streaks with the individual blades matted together and slimy in appearance. White cottony growth may also be seen on the blade.

Helminthosporium. The disease is characterized by an overall thinning of the turf. Lesions on the leaf are purplish to brown. In severe cases the leaves will wilt and die and the sheath may rot. Helminthosporium affects primarily bermudagrass.

Gray leafspot. Gray leafspot primarily attacks st. augustinegrass. Lesions occur on the leaves and may be found on the stems. These lesions are oblong with an ash center and a purple to brown margin. The disease is most prevalent during hot, rainy weather. In severe cases the area may have a scorched appearance.

Nematode. Damage is characterized by a slow decline in the turf, a restricted root system and a general thinning of the area. Because the roots are affected, these areas usually become yellowish and wilt easily.

Diagnostic Tools Used in Analyzing Lawn Problems

Soil tube. A soil tube can be used to take soil samples for making comparisons between good and bad areas in the lawn. Such comparisons may include the effective root depth, the condition of the roots, and the moisture content of the soil. Samples also can indicate compaction, layering, or the presence of mat or buried materials. The tube also can be used to take soil samples to determine the nutritional level and pH of the soil, or for nematode analysis. Soil tubes may be purchased from many garden supply stores.

Hand lens. A hand lens is useful for magnifying insects, disease lesions, and nutritional deficiencies. It is handy for examining roots for nematodes and looking at soil particles.

Metal can. A metal can with the bottom and top cut out is the best tool to use in determining the presence of chinch bugs in a lawn. The can is pressed into the soil and water is added. Chinch bugs then float to the top.

Patch test. The patch test can be utilized to verify the presence of nematodes, insects, and certain nutritional deficiencies. For example, if nematodes are suspected, a very small area can be treated with a nematocide. If the area responds to the treatment, this is a good indication that nematodes are the problem. If worms are thought to be present, an area can be tested with BHC or pyrethrins to bring them to the surface. If a nutritional deficiency seems to be the trouble, small areas can be checked with individual fertilizer nutrients, such as nitrogen or iron. If there is a response to the treatment, your diagnosis is probably correct.

Meeting Dates

Florida Nurserymen and Growers Assn. Meeting, Sheraton Hotel, Ft. Lauderdale, May 13-15.

Alabama Nurseryman's Assn. Meeting, Admiral Semmes Hotel, Mobile, June 6-8.

Mississippi Turfgrass Conference, Mississippi State College, State College, June 14-15.

Western Chapter, International Shade Tree Conference Mirimar Hotel, Santa Barbara, Calif., June 20-23.

Massachusetts Nurserymen's Assn. Summer Meeting, Mahoney's Rocky Ledge Nursery, Winchester, Aug. 4.

Louisiana Nurserymen's Assn. Meeting, Municipal Auditorium, Lafayette, Aug. 5-7.

Southern Nurserymen's Assn. Meeting, Golden Triangle Motor Hotel, Norfolk, Va., Aug. 8-10.

Rutgers University Lawn and Utility Turf Field Day, New Brunswick, N. J., Aug. 11.

Rutgers University Golf and Fine Turf Field Day, New Brunswick, N. J., Aug. 12.

Texas Association of Nurserymen, Shamrock Hilton Hotel, Houston, Aug. 15-18.

Midwest Regional Turf Field Days, Purdue University, Lafayette, Ind., Aug. 16-17.

International Shade Tree Conference 41st Annual Meeting, Washington-Hilton Hotel, Washington, D. C., Aug. 15-19.

Pennsylvania Grassland Council Forage Days, Milton Hershey Farms, Hershey, Aug. 27-28.

Penn State Turfgrass Field Day, on campus, University Park, Pa., Sept. 15-16.

Ohio Agricultural Experiment Station, Lawn and Ornamentals Field Day, Wooster, Sept. 21-22.

Montana-Wyoming Turf and Nursery Assn. Annual Meeting, Montana State College, Bozeman, Mont,. Oct. 4-5.