RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JULY 13, 2006

INSIDE

Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Specialist in Turfgrass Pathology

General

Pythium blight, **brown patch**, **fairy ring**, **dollar spot**, **slime mold**, **copper spot**, **summer patch**, and **anthracnose** are all active on golf and landscape turf at this time. Refer to the recently updated "2006 Pest Control Recommendations for Lawn and Turf Areas" (Bulletin E037; www.rcre.rutgers.edu) for additional information about these and other important turfgrass diseases.

Bentgrass Dead Spot

Although only a disease of new greens and tee construction, it is important to note that this is the time of year when **bentgrass dead spot** occurs in the Mid-Atlantic region. The causal agent, *Ophiosphaerella agrostis,* induces small reddish-brown spots 0.5 to 1 inch in diameter on newly constructed sand-based greens and tees. Spots usually do not coalesce and only enlarge to 4 inches in diameter. Affected areas eventually fade to a light tan color. Initially, symptoms may be confused with **dollar spot, copper spot, black cutworm** injury and golf ball injury. However, upon close inspection, black flask-shaped fruiting bodies (*pseudothecia*) can be found embedded in necrotic leaf and stem tissue. Active patches often have a half inch bronzed outer margin. Foliar mycelium is not apparent in the field. The disease is most serious on high sand content greens and tees (one to six years old). Outbreaks have not been observed on fairways. Environmental conditions that appear to enhance disease development include hot, dry weather. The disease also appears to be more common in sunny locations than in shaded areas. Benzimidazole (e.g., Cleary 3336 50W), dithiocarbamate (e.g., Fore Rainshield 80W), nitrile (e.g., Daconil Ultrex 82.5SDG), phenylpyrrole (e.g., Medallion 50WG) and phosphonate (e.g., Chipco Aliette Signature 80WG) chemical classes have provided the most effective control of bentgrass dead spot in tests conducted by Rutgers faculty. Of the sterol-inhibiting fungicides, only propiconazole (e.g., Banner MAXX 1.3 MC) adequately controlled the disease in these trials, whereas myclobutanil (e.g., Eagle 40W) and triadimefon (e.g., Bayleton 50W) proved ineffective at the rates tested. The strobilurin fungicide pyraclostrobin (e.g., Insignia) consistently suppressed the disease, while the strobilurins trifloxystrobin (e.g., Compass 50WG) and azoxystrobin (e.g., Heritage 50WG) provided poor to fair control of bentgrass dead spot.

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Rutgers Soil Testing Laboratory

The Rutgers Soil Testing Laboratory is a part of Rutgers Cooperative Extension, the outreach component of Cook College and the New Jersey Agricultural Experiment Station. Located on the Cook College campus, the Rutgers Soil Testing Laboratory is a service unit that performs chemical and mechanical analyses of soils for the residents of New Jersey and for University research personnel. The mission of the Laboratory is to provide accurate and timely soil and water test reports to meet the increasing agricultural and environmental needs of the state.

For testing and fees provided for landscape, greenhouse and sports turf, go to the web at:
http://www.rcre.rutgers.edu/soiltestinglab or call the Lab at 732-932-7000, ext. 4231 or e-mail soiltest@rce.rutgers.edu. Soil test kits are available through your county Rutgers Cooperative Extension office.

TURF DISEASES FROM PAGE 1

Gray Leaf Spot

Gray leaf spot caused by the fungus *Pyricularia grisea,* should develop in the tri-state area soon. This disease has devastated many new perennial ryegrass and tall fescue plantings throughout the Mid-Atlantic States in the past. Symptoms start as tiny, brown leaf and stem lesions within a 1 to 2 inch patch. In severe cases, the leaves curl and lesions may extend the entire width of the blade. As the disease progresses, patches coalesce into large (one to two feet diameter) areas of blighted turf. Extensive foliar blighting may occur during warm (75-85^{0}F days and 60-75^o F nights), wet weather. Newly established seedings are more susceptible to infection than mature plantings. When conditions are conducive to disease development, the pathogen produces abundant one to two-celled, pear-shaped spores (conidia). For best results, avoid high rates of nitrogen during July and August and extended periods of leaf wetness (i.e. water in the early morning hours). Fungicide studies conducted in New Jersey, Georgia, Maryland, and Kentucky have shown that Armada, Compass, ConSyst, Headway, Heritage, Insignia, Spectro, Tartan, thiophanate-methyl, and Zyban were most effective when applied on a preventive basis every 14 to 28 days beginning in mid-July. Chlorothalonil (e.g., Daconil) and the DMI (sterol-inhibiting) fungicides, such as propiconazole (e.g., Banner), may provide effective control when disease pressure is moderate. Isolates of *P. grisea* resistant to the QoI (Strobilurin) fungicides and strains with reduced sensitivity to the DMI's have been reported in New Jersey.

Pythium Blight

With the recent hot, humid weather, **pythium blight** continues to be reported on golf and landscape turf. Pythium thrives in low or poorly drained areas, especially when the night temperatures are above 68 to 70^{0}F. For best results, improve drainage, water in the early morning hours (midnight to 8 am), avoid over-fertilization, and apply Alude, Banol, Chipco Signature, Headway, Heritage, Insignia, Koban, Magellan, mancozeb, Prodigy, Quell, Subdue MAXX, Terraneb SP, or Terrazole, according to the manufacturer's recommendations. Caution: Koban and Terrazole can be phytotoxic during hot weather, so follow label directions carefully and experiment first on a small area if using either product at this time of year.

Summer Patch

Summer patch is apparent now on many turf areas containing Kentucky bluegrass, annual bluegrass, and fine fescues. To control existing infections, apply Armada, Banner, Bayleton, Compass, Eagle, Headway, Heritage, Insignia, Rubigan, Tartan, or thiophanate-methyl (e.g. Cleary's 3336, Fungo 50 etc.) in 4 to 5 gal of water/1000 ft^2. Repeat every three to four weeks (every two weeks if using thiophanate-methyl). If fungicides cannot be applied with this much water, irrigate them into the thatch immediately with 1/16 to 1/8 inch of water. Aerification (when symptoms are not present) and improved drainage will also aid in disease suppression. Soil pH should be maintained at or slightly below 6.0 for optimum disease control.

Turf Field Day

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on August 2, 2006 (Landscape Turf Research Field Day at Adelphia, NJ) and August 3, 2006 (Golf Turf Research Field Day at Hort Farm II, Ryders Lane, New Brunswick, NJ). Additional information, on-line registration, and directions can be accessed at http://www.rutgers.turf.edu. ❑

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

Turf

The trend in turfgrass samples in early-July is stress. Numerous cup cutter plugs of golf turf have been submitted to the laboratory with poorly performing turfgrass. While we have seen some disease, the majority of the samples were diagnosed with **abiotic disorders**. All of the rain in June and early-July and the long run of high night temperatures have caused most of the annual bluegrass out there to lose its roots. In fact, putting greens at many locations are also not drying well, so many of the samples we are seeing are simply greens with **wet wilt**. I have a feeling that many of you will be chasing wilt for the rest of the season. Greens with other issues, most notably accumulating thatch layers, are worse than the others. These greens hold more moisture or dry out too fast, but also because they are soft and spongy when wet. These greens all have evidence of **mower scalping**. It is extremely important at this time to manage your turf for stress reduction. Conditions are ripe for turf failure and an explosion of anthracnose is just around the corner. One superintendent I talked to said with a chuckle "I know, I know, stop managing my grass for the summer!"

Speaking of **Anthracnose** - The disease is starting to show up in the lab with increasing frequency. Samples with anthracnose were sent from golf courses in Pennsylvania, New York, and Connecticut, as well as, from Atlantic, Bergen, Burlington, Morris and Passaic Counties in New Jersey. Another summer disease, **Summer Patch**, is beginning to exhibit symptoms in the field as well. Samples with summer patch were submitted from Connecticut, New York, Delaware, and Michigan, as well as from Camden, Bergen and Somerset Counties in New Jersey. Excess soil moisture in the spring is often associated with increased summer patch activity later, so we expect to see many more summer patch samples over the next two to three weeks. **Pythium blight** was active in a sample of ryegrass from a local ball field and from golf courses in Atlantic and Ocean Counties. It is summer, so we can't forget **brown patch**. Recent samples were from New York and Morris County, but I see the disease in home lawns all over the place as I drive around Central Jersey. We are also seeing a number of samples with **slime molds** and **fairy rings**. Lastly, high pollutions of **lance**, **stunt**, **spiral**, and **root knot** nematodes have been observed in several samples.

Ornamentals

Not much to say on the ornamentals front – a hot dog and a beer (veggie dog and diet coke?) and the landscape starts looking pretty good! A couple samples were submitted in the last two weeks though. **Cedar apple rust** and **apple scab** were diagnosed on crab apple samples from Warren and Monmouth Counties. A branch from an ornamental pear was brought to the laboratory yesterday from a local shade tree commissioner. The branches of this rather large tree were breaking off in storms. This is not at all uncommon for pear, but in this case, the circumstances were a little different than normal. The broken branches had been colonized and damaged by **leopard moth**, *Zeuzera pyrina*. Leopard moth larvae bore the cambium and the heart wood of susceptible trees and cause significant damage. It is very similar to what we would expect from a very large long horned beetle and could be easily misdiagnosed. The damage is severe, so the structural integrity of the tree is compromised and wind thrown limbs result – nice! ❑

Rutgers Plant Diagnostic Laboratory

The Rutgers Plant Diagnostic Laboratory is a full-service plant health diagnostic facility sponsored by Rutgers Cooperative Extension, the outreach component of Cook College and the New Jersey Agricultural Experiment Station. The Lab's mission is to provide accurate and timely diagnoses of plant health problems for the residents of New Jersey.

Located on the Cook College Campus in New Brunswick, NJ, the Lab provides plant health diagnostic services in cooperation with Extension faculty, staff, and other university personnel. The Lab serves residential and commercial clientele.

The Rutgers Plant Diagnostic Laboratory provides the following services:

- Disease and Insect Pest Diagnosis
- Plant and Weed Identification
- Insect Identification
- Fungus and Mold Identification
- Nematode Assays
- Screening for Acremonium Endophytes
- Fungicide Resistance Screening
- Other Services Available by Contract

For fees and instructions on how to submit samples, go to the web at: http://www.rcre.rutgers.edu/plantdiagnosticlab or call the lab at 732-932-9140, fax 732-932-1270 or e-mail clinic@rce.rutgers.edu.

Dutch Elm Disease

Ann B. Gould, Ph.D., Specialist in Plant Pathology

Dutch elm disease is one of several vascular wilt diseases that affect shade trees in New Jersey landscapes. This group of diseases, which includes **Verticillium wilt** of maple and **Mimosa wilt**, are caused by pathogens that reside in the xylem (water-conducting tissue) of plants and disrupt the uptake of water and minerals. The primary characteristic of wilt diseases is, as you would expect, wilting due to water stress. This stress occurs when xylem vessels are blocked by the pathogen (disease agent) or by the host itself as it attempts to halt the movement of the pathogen through the transpiration stream.

One of the most important vascular wilt diseases of shade trees is Dutch elm disease. In New Jersey, Dutch elm disease, caused by the fungal pathogens *Ophiostoma ulmi* and *Ophiostoma novo-ulmi*, appears on affected American elms in June through August. The first symptom of the disease is wilting (called flagging) of leaves on individual branches throughout the canopy. These leaves rapidly turn yellow, then brown, and then curl and drop from the tree. Affected branches die shortly after. Rapid mortality (within one season) occurs in trees that become infected with the pathogen in early spring. Trees infected later in the summer may often take several years to die.

Disease spread

Dutch elm disease is transmitted (or vectored) from tree to tree by insects or through root grafts. Beetles that vector the disease include the **Native elm bark beetle** and the smaller **European bark beetle**. The insects are attracted to dead or dying elm wood, where they lay eggs in tunnels (called galleries) just beneath the bark. As new beetles emerge, they may carry spores of the pathogen on their bodies, and will transmit these spores to healthy trees as the beetles feed on branch inner bark or in the crotches of twigs. Alternatively, when the pathogen spreads from an infected tree to a healthy tree through root grafts, it can move very quickly through the transpiration stream of the healthy tree. Thus, root graft transmission is very important in trees that are closely spaced.

To detect Dutch elm disease, look for vascular discoloration in the outer layers of wood on infected twigs and branches. Peel back the bark using a pocketknife; vascular discoloration usually appears as brown streaks in the sapwood of the current growing season. To detect infections that may have occurred the previous year, look for streaking as you cut deeper into the wood, or look at the branch in cross section.

Another vascular disease of elms, called Verticillium wilt, also causes vascular streaking in the wood. For a positive diagnosis, submit a sample to a diagnostic laboratory (such as the Rutgers Plant Diagnostic Laboratory) for analysis.

Management

The most effective means of saving elm trees includes a combination of cultural and chemical controls. Prompt removal of diseased limbs up to 10 feet behind yellowed foliage is essential. For best results, control bark beetles with dormant applications of methoxychlor or use azadirachtin, bifenthrin, carbaryl, chlorpyrifos, methoxychlor, or permethrin as per label directions. Remove dead or dying elms as soon as they are noticed, and debark or burn dead wood prior to beetle emergence next spring. To prevent root graft transmission of this disease, dig a trench (3 feet deep) midway between diseased and healthy elms, or apply Vapam per manufacturer's recommendations. In addition, valuable trees may be injected on a preventive basis with propiconazole (Alamo, Propiconazole G-Pro, Quali-Pro 14.3, Savvi), thiabendazole (Arbotect 20S), Mauget Fungisol, Mauget Abasol, Mauget Imisol, tebuconazole (Maujet Tebuject), or Phyton 27 as per manufacturer's recommendations. When trees exhibit more than 5% crown symptoms, fungicide injection may be ineffective.

Native American elms vary in their susceptibility to Dutch elm disease. The most susceptible elm is the American elm (*Ulmus americana*), whereas other elms such as winged elm, slippery elm, rock elm, and cedar elm vary from susceptible to somewhat tolerant. Within species, individual trees or cultivars may vary in susceptibility. Siberian and Chinese elms are less susceptible to Dutch elm disease.

For more information, refer to a listing of elm cultivars with comments on their susceptibility to Dutch elm disease written by Frank Santamour and Susan Bentz (see reference list below). American elms that have a history of tolerance or resistance include the Princeton Elm, American Liberty, Independence, Valley Forge, and New Harmony.

References:

Santamour, F. S., and Bentz, S. E. 1995. Updated checklist of elm (Ulmus) cultivars for use in North America. J. of Arboriculture 21:122-131. ❑

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged near normal, averaging 72 degrees north, 74 degrees central and 75 degrees south. Extremes were 94 degrees at Hammonton and Pomona on the 5th, and 54 degrees at Charlotteburg and Long Branch on the 7th. Weekly rainfall averaged 1.64 inches north, 1.46 inches central, and 1.94 inches south. The heaviest 24 hour total reported was 2.03 inches at West Deptford on the 5th to 6th. Estimated soil moisture, in percent of field capacity, this past week averaged 90 percent north, 85 percent central and 82 percent south. Four inch soil temperatures averaged 74 degrees north, 75 degrees central and 76 degrees south.

Weather Summary for the Week Ending 8 am Monday 7/10/06

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
CANOE BROOK	1.89	17.35	-.40	90	56	74.	2	1412	357	91
CHARLOTTEBURG	1.08	17.77	-.17	87	54	71.	2	1161	319	82
FLEMINGTON	1.94	23.16	6.10	87	55	73.	0	1349	258	91
FREEHOLD	1.40	16.75	.10	91	54	73.	0	1366	177	88
LONG BRANCH	1.43	17.30	.67	92	54	74.	1	1282	166	77
NEW BRUNSWICK	1.48	16.99	.60	90	56	74.	0	1442	178	89
TOMS RIVER	2.15	15.12	-1.63	91	57	74.	0	1366	242	78
TRENTON	.84	16.94	1.50	89	60	75.	0	1482	165	66
CAPE MAY COURT HOUSE	1.36	11.15	-3.55	92	59	74.	0	1387	184	81
DOWNSTOWN	1.84	14.36	-.83	92	60	74.	-1	1448	116	81
GLASSBORO	2.43	16.04	-.26	90	64	75.	0	1605	294	73
HAMMONTON	1.84	13.57	-2.58	94	61	75.	0	1530	225	77
POMONA	2.37	14.87	.37	94	59	75.	1	1425	221	78
SEABROOK	1.82	17.35	2.70	93	62	76.	1	1663	323	72
SOUTH HARRSION missing										
WES KLINE — GDD BASE 40 PINEY HOLLOW										
LAST WEEK 255 (Ending 7/03/06)										
THIS WEEK 241 (Ending 7/10/06)										

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