RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JULY 12, 2007

INSIDE

Diseases of Turfgrass

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

Brown Patch

This disease, caused by the fungus Rhizoctonia solani, is very common on tees, greens, and home lawns due to the continuous hot, humid weather. To reduce the incidence and severity of brown patch, avoid applying high rates (greater than 0.25 lb) of nitrogen during hot weather, irrigate between midnight and 8 am (to displace dew and reduce the period of leaf wetness), and spray turf with Armada, Banner, Chipco 26GT, chlorothalonil, Compass, ConSyst, Curalan, Disarm, Eagle, Endorse, Headway, Heritage, Insignia, mancozeb, Medallion, Prostar, Spectro, thiophanate-methyl, Tartan, Touche, or Trinity per manufacturer's recommendations.

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, Disarm, 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.

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 60-75^0 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). To suppress this disease, avoid high rates of nitrogen during July and August and

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extended periods of leaf wetness (i.e. water in the early morning hours). Fungicide studies have shown that Armada, Compass, ConSyst, Disarm, Headway, Heritage, Insignia, Spectro, Tartan, and thiophanate-methyl 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.

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, Trinity, or thiophanate-methyl (e.g. 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 Days

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on Tuesday, July 31, 2007 (Golf and Fine Turf Research Field Day at Hort. Farm II, New Brunswick, NJ) and Wednesday, August 1, 2007 (Landscape Turf Research Field Day at the Adelphia Research Farm, Freehold, NJ). Pesticide credits will be available on both days. Registration and directions can be accessed via www.njturfgrass.org. ❑

Powdery Mildew

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

As a homeowner, I don't pay much attention to **powdery mildew** until the disease starts to affect my lilacs and peonies. Powdery mildew is a "summer time" disease that tends to affect outdoor plants after the growing season has begun. It's probably the most commonly recognized disease of ornamental plants in the nursery and landscape, affecting more than 7000 plants worldwide (Table 1). Powdery mildews do not affect gymnosperms, which is one good thing to be said about them.

Powdery mildew is caused by more than 300 species of fungi. The powdery mildew fungi most troublesome to North American flowering plants include species of *Erysiphe*, *Microsphaera*, *Phyllactinia, Podosphaera, Sphaerotheca*, and *Uncinula*. These fungi are **biotrophs** (also called **obligate parasites**); they obtain all their food only from other living organisms. Powdery mildew fungi obtain nutrients by sending a specialized absorbing structure called a **haustorium** into the cells of the host plant epidermis. Nutrients are translocated from the haustorium to the powdery fungal growth evident on the surface. The relationship between fungus and host plant is pretty sophisticated; the fungus gets the nutrition it needs from the host, but the host is not usually seriously harmed. Most powdery mildew species are host-specific, development of powdery mildew on one species will not necessarily lead to disease on other hosts nearby (see Table 1 on page 3 for susceptible plants).

Symptoms

As the name suggests, powdery mildew appears as a white to tan superficial growth on the surface of affected leaves and other aerial tissues. Signs of the fungus can first appear as individual spots that coalesce to cover the entire tissue surface. This fungal growth (called a mycelium) produces asexual spores (or conidia) on stalks that permit air currents to pick up the spores and distribute them to other susceptible plants. Young plants and tissues are often more susceptible to this disease.

Although the fungus does not directly kill the cells it invades, infection does result in a reduction of photosynthesis and an increase in water loss. As a result, the growth rate and aesthetic value of infected plants may be reduced. Leaves may be stunted, curled, or twisted; in highly susceptible plants, new growth, flowers, and buds can be destroyed.

Disease Cycle

Look for powdery mildew disease in the Northeast during the late spring to early fall months. Powdery mats of fungal mycelia develop on susceptible tissues all growing season, and conidia produced by the fungus are carried by the wind to new hosts. Powdery mildew fungi can overwinter in a characteristic fruiting structure (called a **cleistothecium**) that is the result of a sexual reproductive process. Cleistothecia are dark, tiny spheres (about the size of coarse, ground pepper) that can often be seen on infected tissues later in the growing season. During the spring of the following year, these cleistothecia release spores (called ascospores) that start the infection cycle anew. In warmer climates or in greenhouses, the formation of cleistothecia is never observed, and the disease may persist all year as mycelia and conidia. In other cases, the fungus may enter buds and survive the winter there.

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Powdery mildew conidia germinate and penetrate host tissues in about 6 hours, and under favorable conditions, the mycelium develops and new spores are produced within 4 to 6 days. Unlike most fungi, the penetration process can occur in the absence of free water, and high humidity does not necessarily promote disease development. Indeed, in many cases, frequent periods of leaf wetness can reduce the severity of this disease. Although the development of powdery mildew is most rapid during periods of warm weather (80°F day/60°F night), damage due to the disease can be actually more severe at cooler temperatures (70°F day/50°F night).

Management

To manage powdery mildew in ornamental plantings, improve air movement around plants through proper spacing and weed control, and increase the amount of sunlight that reaches foliage. Rake old leaves and prune shoots infected the previous growing season to reduce inoculum. Practices that promote succulent growth, including pruning and nitrogen fertilizing, should be avoided on susceptible hosts. Cultivars of crabapple, dogwood, lilac, and crape myrtle resistant to this disease are available and should be planted whenever possible. Rhododendrons that are very susceptible to powdery mildew include Elizabeth, Virginia Richards, Unique, and the Loderi group; many deciduous azaleas are susceptible as well. Plants that are less susceptible include Nova Zembla, Palestrina, and Vulcan.

Since powdery mildew fungi are associated with the surface of leaves, they are easier to manage with fungicides than other foliar diseases. Compounds labeled for powdery mildew control include azoxystrobin, Bacillus subtilis, copper (hydroxide, metallic, salts, sulfate), fenarimol (field and landscape only), hydrogen dioxide, Junction, kresoxim-methyl, Manhandle, myclobutanil, neem oil, paraffinic oil, piperalin (enclosed structures only), potassium bicarbonate, propiconazole, Spectro, sulfur (dusting, elemental, flowable, wettable), SysStar, thiophanate-methyl, trifloxystrobin, triadimefon, triflumizole, Twosome, and Zyban. Most of these compounds are applied at the first sign of disease; however, consult the label for timing, rates, and appropriate hosts. ❑

Table 1. Some ornamental plants susceptible to powdery mildew

apple, crabapple	lilac
azalea, rhododendron	Lonicera
ash	lilac
basswood	magnolia
beech	maple
Berberis	monarda
birch	oak
blueberry	phlox
buckeye	Prunus (peach, plum, cherry, apricot)
catalpa	pear
Chinese photinia	peony
chrysanthemum	poplar
cotoneaster	privet
crape myrtle	pyracantha
dahlia	Reiger begonia
delphinium	roses
elm	serviceberry
eucalyptus	spirea
euonymus	smoke-tree
flowering dogwood	snapdragon
gardenia	sycamore
hawthorn	tulip tree
holly	Vaccinium
honeysuckle	viburnum
horse chestnut	walnut
hydrangea snowball	wintercreeper
kalanchoe	willow
Kalmia	wisteria
leucothoe	zinnia
ligustrum	

Plant Diagnostic Laboratory Update

Richard J Buckley, Laboratory Coordinator

Turfgrass

Despite the beautiful weather and relatively easy season to date (the lab is very slow), **anthracnose** is our main concern for golf turf this period in the Plant Diagnostic Laboratory. In my view, anthracnose is more dependent on cultural issues rather than the weather, so we would expect anthracnose on certain sites regardless. The disease was diagnosed on plugs of annual bluegrass and creeping bentgrass from golf courses in Burlington, Camden, Middlesex, Morris, and Sussex counties, and on samples from New York, Pennsylvania, and Delaware. **Summer patch** samples (it is summer) are increasing in frequency in the laboratory. Samples of that disease were submitted from golf courses in Burlington, Middlesex, Morris, and Somerset counties. **Brown patch** has also been very active recently on landscape turf. Several samples from residential lawns were submitted just yesterday along with a sample from a famous park in Manhattan. In the "something for everyone" category, we had a sample of **dollar spot** from a Monmouth County golf course, a sample of **leaf spot and melting out** from the New York Park, and a sample of **brown blight** from the breeding farm in Adelphia.

Ornamentals

Ornamentals were few, but not disappointing. We saw several samples of **spruce spider mite** damage on arborvitae this period. A sample of willow from an Atlantic County arborist had **leopard moth** damage and **cytospora canker**. **Magnolia scale** was diagnosed on Magnolia (go figure?) from a Hunterdon County nursery and **fire blight** was identified on an ornamental pear from Atlantic. Rose samples were well represented in the lab this week. The rose from Monmouth County had the **bristly roseslug**, *Cladius difformis*, and the one from Warren had a plain old **roseslug**, *Endelomyia aethiops*. Roseslugs are the larvae of sawflies, which are actually wasps…..huh? Have you seen all of the **Japanese beetles** flying about? They are doing their part to kill plants. How about you? ❑

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged below normal, averaging 70 degrees north, 71 degrees central and 73 degrees south. Extremes were 95 degrees at Pomona on the 9th, and 47 degrees at Flemington on the 3rd. Weekly rainfall averaged 1.42 inches north, 1.25 inches central, and 0.40 inches south. The heaviest 24 hour total reported was 1.96 inches at Canoe Brook on the 4th to 5th. Estimated soil moisture, in percent of field capacity, this past week averaged 92 percent north, 81 percent central and 60 percent south. Four inch soil temperatures averaged 68 degrees north, 70 degrees central and 71 degrees south.

Weather Summary for the Week Ending 8 m Monday 7/ 9/ 7

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
CANOE BROOK	2.11	27.13	9.52	91	50	72.	0	1371	338	89
CHARLOTTEBURG	.75	20.35	2.54	83	48	69.	0	1179	356	82
FLEMINGTON	1.96	24.83	7.91	89	47	70.	-3	1275	207	93
NEWTON	.87	16.23	.08	87	49	68.	-2	1148	235	87
FREEHOLD	1.55	20.77	4.25	91	48	72.	-1	1453	287	87
LONG BRANCH	1.02	20.75	4.24	92	54	72.	-1	1249	156	75
NEW BRUNSWICK	1.62	26.72	10.48	91	52	72.	-2	1372	132	90
TOMS RIVER	.59	16.08	-.52	91	50	71.	-3	1296	196	55
TRENTON	1.48	22.56	7.27	90	53	71.	-4	1436	144	76
CAPE MAY COURT HOUSE	.06	11.52	-3.07	92	54	72.	-2	1323	144	47
DOWNSTOWN	.54	16.05	1.00	92	51	72.	-3	1437	130	55
GLASSBORO	.95	20.31	4.15	92	54	74.	-1	1610	324	69
HAMMONTON	.27	15.54	-.36	94	52	73.	-2	1484	204	42
POMONA	.26	15.87	1.50	95	51	73.	-1	1422	242	42
SEABROOK	.34	16.77	2.25	93	54	75.	0	1616	301	44
SOUTH HARRISON	.69	18.24	1.19	91	56	73	NA	1558	NA	NA

WES KLINE -- GDD BASE 40 PINEY HOLLOW LAST WEEK 245 (Ending 7/2/07) THIS WEEK 226 (Ending 7/9/07)

RUTGERS
New Jersey Agricultural
Experiment Station

Plant & Pest Advisory
Rutgers School of Environmental
and Biological Sciences
ASB II, 57 US Hwy. 1
New Brunswick, N.J. 08901

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

PLANT & PEST ADVISORY
Landscape, Nursery & Turf Edition Contributors

RCE Specialists and Staff
Bruce B. Clarke, Ph.D., Turf Pathology
Ann B. Gould, Ph.D., Ornamentals Plant Pathology
Steven Hart, Ph.D., Weed Science
Joseph R. Heckman, Ph.D., Soil Fertility
Albrecht Koppenhofer, Ph.D., Turfgrass Entomology
James A. Murphy, Ph.D., Turf Management
Gladis Zinati, Ph.D., Nursery Management
Richard J. Buckley, Coordinator, Plant Diagnostic Laboratory

RCE County Agricultural Agents and Program Associates
Bergen, Joel Flagler (201-336-6780)
Burlington, Raymond J. Samulis (609-265-5050)
Camden, James Willmott (856-566-2900)
Steven Rettke, Program Associate IPM
Cape May, Jenny Carleo (609-465-5115)
Cumberland, James R. Johnson (856-451-2800)
Essex, Jan Zienteck, Program Coordinator (973-353-5958)
Gloucester, Jerome L. Frecon (856-307-6450, ext. 1)
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)
Middlesex, William T. Hlubik (732-398-5260)
Monmouth, Richard G. Obal (732-431-7261)
Morris, Pedro Perdomo (973-285-8307)
Passaic, Elaine F. Barbour, Agric. Assistant (973-305-5740)
Somerset, Nick Polanin (908-526-6293)
Sussex, Brian Oleksak, Program Associate (973-948-3040)
Union, Madeline Flahive-DiNardo (908-654-9854)
Warren, William H. Tietjen (908-475-6505)

Newsletter Production
Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is reponsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCE in your County.

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