

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION \$1.50

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Understanding your Lawn/Landscape/ Garden Soil Test Report, Part I

Stephanie Murphy, Ph.D., Coordinator, Soil Testing Laboratory

pH is a measure of the hydrogen ion concentration [H⁺] in a suspension (equal volumes) of soil in water. This tells whether the soil solution is acidic (pH<7.0), neutral (pH=7.0), or basic/alkaline (pH>7.0); a brief statement categorizes the pH and explains the general suitability for plant growth. On the pH scale of 0 to 14, soil samples usually fall in the range from 4.5 to 7.5. Extremes of soil pH outside of that range do exist and may require special remediation efforts. Soil pH affects nutrient uptake and determines potential for root damage.

Lime Requirement Index (LRI) is a measure of the buffering ability of the soil. Highly buffered soils, usually containing greater clay and/or organic matter contents, resist efforts to change soil pH, and therefore require greater rates of amendments. Poorly buffered soils, such as low-organic matter sandy loams or coarser soils, are more susceptible to pH modification and require lesser rates of amendments. LRI values usually range from 7.0 to 8.0, with the greater value signifying lower buffering capacity. The LRI is used in conjunction with the soil pH and the “target” pH of the desired plant to determine application rate of limestone, if needed to neutralize acidity (raise pH).

Recommendations

Recommendations for soil amendments are provided by the Soil Testing Laboratory to bring the soil into the “optimum” range for the plants specified by the client.

Lime Recommendation tells the application rate of agricultural limestone necessary to achieve the “target” pH range. The recommendation is usually in terms of pounds per 1000 square feet, but in some cases may be for smaller areas. For areas greater or smaller than units given, the amounts will be proportional (example: a recommendation of 10 pounds per 1000 square feet will require 20 pounds of product for 2000 square feet). For established plants (already in-ground), no more than 50 pounds limestone per 1000 square feet should be applied at one time; split applications are specified. For new plantings, the whole dose usually can be applied all at once assuming that the soil will be tilled to mix the limestone into the soil, preferably to 6” depth.

When magnesium levels are below optimum, dolomitic limestone may be specified because it contains up to 13.1% magnesium in addition to calcium; therefore the nutrient deficiency is treated concurrently

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Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

Turf

It is back to school time for the kids and a return to disease submissions for the diagnostic laboratory. Late season **summer patch** has been the most common problem in the laboratory this last period. Samples of the disease were sent to the laboratory from golf courses in New Jersey, New York, and Pennsylvania. It is not uncommon to see small runs of this disease after Labor Day as fungicide programs wane and summer stresses continue. Although we are still seeing summer patch, we also had our first **take-all** diagnosis of the fall. The take-all was found on bentgrass samples from a Monmouth County golf course. The samples with take-all also had **anthracnose**. It is not uncommon to see anthracnose on turf infected with a root-infecting patch disease. In fact, we used to use anthracnose as a signal to look for patch diseases way back when.....**gray leaf spot** was identified on a sample of ryegrass from a Philadelphia area golf course. The disease did some significant damage to several fairways. In home lawns **dollar spot** continues to be a problem, but the most exciting thing we found this week were the samples with active **chinch bug** infestations. If you have an area of turf that will not recover with the cooler weather and rain, then poke around in the thatch because chinch bugs appear to be a real possibility this season. The chinch bugs came from Morris and Bergen County landscapes.

Landscape

Red oak and pin oak with **bacterial leaf scorch** (BLS) continue to be submitted to the laboratory. Samples this time were from Middlesex and Hunterdon Counties. Other diseases and insect pests of note include: **spruce spider mite** on white pine samples from Middlesex County; **juniper scale** on juniper from Atlantic County; **obscure scale** on plum from Middlesex County; **cytospora canker** on Japanese maple from an Essex County landscape; and **volutella stem blight** on boxwood from Long Island.

Greenhouse and nursery

Phytophthora crown and root rot is the primary disease from nursery crops. The disease was identified on *Pieris japonica* from a Cumberland County nursery and on *Rudbeckia* from a Union County operation. □

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with the pH issue. As mentioned earlier, supplemental calcium is sometimes required when pH does not need modification; in that case, an application of agricultural gypsum (calcium sulfate) will be recommended in place of a liming material.

In the situation where pH falls into the optimum range, there will be advice not to apply limestone. Routine applications of limestone without benefit of soil test recommendation often lead to excessively high pH (alkalinity). If pH is neutral or slightly above (up to 7.4), the recommendation is similar: do not apply any limestone or compost or ashes which would exacerbate the alkalinity; soil pH in the humid eastern U.S. will tend to drop over time, eventually falling back into the optimum range. When pH is over 7.5, the pH is so much out of acceptable range that it must be amended to hasten its return to optimal soil range. Amendments of elemental sulfur are the preferred manner to accomplish this; aluminum sulfate rates are provided as an alternative. Sulfur may be difficult to find, but garden stores and nurseries are more likely to carry this product than large retailers; sometimes it can be found in the natural pesticides section because it also has use as a foliar fungicide. In soil, the sulfur is oxidized by special microorganisms and the product is an acid. Since the process is biologically mediated, there is a significant lag time (approximately six weeks). Aluminum sulfate, because of the chemical nature of its reaction in soil, is faster-acting as a soil acidulant than elemental sulfur but causes a brief period of aluminum toxicity in the soil; for that reason it is mostly used for pre-plant applications when it will not come directly into contact with plant roots. Although slower acting, the sulfur product can be used with established plants as well as for soil preparation before planting. Application rates for sulfur and aluminum sulfate depend on soil texture because of its influence on buffering capacity. Another option for acidifying when ornamentals are to be planted is incorporation of acidic peat moss (sphagnum or reed sedge). This needs to be mixed into the soil - not left on the soil surface, but it has the extra advantage of adding organic matter to improve internal soil conditions (water holding capacity, permeability, structure and tilth). There are no guidelines available for rates needed to decrease soil pH; instead, it is recommended that the amended soil be analyzed to determine pH and further need for modification.

In extreme cases of pH, a message will be printed that suggests consultation with your county extension agent. Very low pH can represent acid-producing sediments, typically exposed at the surface during excavation or grading operations. The pH cannot be corrected even with massive amounts of limestone and presents a hazardous situation. At the other extreme, pH above 8.3 represents excessively high salt concentrations that cause multiple challenges to plant growth. Remediation of extreme soil pH is best addressed on a case-by-case basis.

Nutrients will be covered in Part II, in the next issue of the Landscape, Nursery & Turf edition. □

Leaf Scorching in Shade Trees – Biotic or Abiotic?

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

I've received several calls the last month regarding leaf scorching in shade trees such as maple and linden. Leaf scorching in landscape trees and shrubs occurs when leaves lose water faster than the roots can supply it. When moisture is lacking, the margins tend to dry out first, hence the marginal scorch pattern typically associated with stressed plants. Symptoms of scorch may become evident any time water flow is disrupted within a plant.

Leaf scorching in plants is usually attributed to both biotic (living) and abiotic (environmental) agents. Why is it important to tell the difference, and how does one do it?

Abiotic (or environmental) agents that can cause scorching in leaves include drought, dehydrating winds, salt, flooding, chemicals, air pollutants, toxic metals, and nutrient extremes. Scorching can also occur when plants are placed in sites where roots do not develop normally (such as in planting islands or in soils with a hard pan layer), or when roots are physically damaged (such as occurs during construction). In most cases, this type of scorching is fairly uniform around leaf edges, affects newer leaves as well as older leaves, and will appear on vast expanses of the canopy. In addition, scorch symptoms may develop soon after a known stress (such as drought or an application of de-icing salt) occurs.

On the other hand, scorching can also occur in plants affected by living or **biotic** agents. Organisms that can cause this symptom include fungi, bacteria, nematodes, viruses, and insects. Leaf scorching due to biotic agents is not clearly defined. The scorch symptoms on leaves are often irregular in shape, and frequently a yellow or red "band" will appear between green and scorched tissues. In addition, symptoms may appear first on the older leaves of one or more branches, and then spread to other parts of the tree.

This growing season, the leaves of many landscape plants throughout New Jersey are exhibiting the uniform "scorch" consistent with an abiotic stress. Drought stress is the likely culprit for many trees, especially seedlings and shallow rooted and recently planted trees and shrubs that lack extensive root systems which cannot absorb water from deeper in the soil profile.

Some trees in the New Jersey landscape, primarily oaks, are also affected by a biotic agent that causes leaf scorch. **Bacterial leaf scorch of shade trees** (BLS), caused by the bacterium *Xylella fastidiosa*, was addressed in the August 22nd issue of this newsletter. This disease, which is very prevalent in many localities, is more typically found in the more central and southern counties of New Jersey. Like leaf scorching due to other biotic agents, leaf scorch caused by *Xylella* is not clearly defined; scorch symptoms are often irregular in shape, and frequently a dull red "band" is apparent between healthy and scorched (necrotic) tissues. Look for these symptoms in the landscape *now*.

In summary, leaf scorch in landscape trees and shrubs can be due to a wide variety of agents. The cause of the scorch determines how the plants should be cared for. Keep the following tips in mind when trying to discern the difference between the abiotic and biotic causes of leaf scorch. If unsure about your diagnosis, contact your local County Agricultural and Resource Management Agent.

Leaf scorching due to abiotic agents:

- Is fairly uniform around leaf margins
- Affects newer as well as older leaves on a branch
- Appears on vast expanses of canopy (e.g., one side of the tree or the other)
- Develops soon after a known stress (such as prolonged drought or an application of de-icing salt) occurs
- Can often be associated with poor sites or root injury due to construction
- Often affects more than one species of plant on a landscape.

Leaf scorching due to biotic agents (particularly in the case of BLS):

- Is not uniform around leaf margins; often, a dull red or yellow "band" appears between green and scorched tissues
- May affect older leaves first, although sometimes affects all leaves on a branch
- Appears on selected branches throughout the canopy
- May spread to new branches as time progresses, leading to tree decline
- Develops in mid- to late-summer
- Is host specific
- Is enhanced by abiotic stresses (such as drought), other diseases, and insect problems.

Diseases of Turfgrass

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

General

Dollar spot, gray leaf spot, and rust are all active at this time. Refer to recent issues of this newsletter for additional information about the identification and management of these diseases.

Stem and Crown Rust

Both diseases are prevalent on susceptible Kentucky bluegrass and perennial ryegrass cultivars, respectively, at this time. As rust intensifies, affected turf prematurely yellows and orange pustules called uredia (reproductive structures) appear on leaf blades. To control both stem and crown rust, maintain adequate fertility and soil moisture, and apply Armada, Banner, Bayleton, chlorothalonil, Compass, Eagle, Headway, Heritage, Insignia, mancozeb, Tartan, or Trinity per manufacturer's recommendations.

Stripe Smut

This disease, caused by the fungus *Ustilago striiformis*, will soon develop on sensitive Kentucky bluegrass cultivars. Symptoms typically appear as long black streaks (striations) between the veins of infected blades. These areas eventually rupture releasing abundant black smut spores. Research at Rutgers has shown that one well-timed application of a systemic fungicide in early to mid-October offers excellent control and is, therefore, far superior to multiple applications in the spring (mid-May). For best results, apply Armada, Banner, Bayleton, Eagle, Rubigan, Tartan or thiophanate-methyl now per manufacturer's recommendations.

Take-all patch

This disease, caused by the root and crown infecting fungus, *Gaeumannomyces graminis* var. *avenae*, may redevelop on bentgrass greens and fairways during the next few weeks. Although this disease is most prevalent from April through June, late-summer and fall outbreaks are not uncommon. Infection takes place during cool, wet weather and symptoms are most striking after stress. Infected grass first appears bronze to reddish-brown in color and then fades to a dull brown. Patches are usually circular or ring-shaped and range in size from several inches to two feet or more in diameter. The centers of affected turf are frequently colonized by bluegrass (*Poa* spp.), fescue (*Festuca* spp.), or weeds. Upon close examination, decaying roots and leaf sheaths appear black and dark strands of mycelium often develop parallel to the root axes. The disease is enhanced by poorly drained, light-textured, and high pH soils. Although take-all is difficult to control, best results have been achieved through the use of acidifying fertilizers during cool weather (e.g., ammonium sulfate) and preventive

applications of Banner, Bayleton, Headway, Heritage, Insignia, Trinity, or Rubigan in October and November. If the disease has been particularly severe, fungicides should be reapplied twice next spring at 21 to 28-day intervals beginning in early April. Chemicals should be applied in 4 gal water/1000 sq ft or irrigated into the root zone (1/8 to 1/4" of water) for maximum effectiveness. Whenever practical, overseed infested areas with less susceptible grasses such as fine fescue, Kentucky bluegrass, or perennial ryegrass to mask symptom expression. Maintain soil pH at approximately 6.0 since the disease is enhanced in alkaline soils. Manganese (2 lb Mn/A), applied in early April, can help reduce disease severity in soils that are deficient in this micronutrient.

Turf Expo

This year's Turf Expo will be held at the Trump Taj Mahal Casino/Resort on December 5-7, 2007. This is an excellent opportunity to receive the latest turf management information from nationally renowned speakers. For additional information, please contact Cece Peabody (973) 812-6536 (e-mail execdirector@njturfgrass.org) or Marlene Karasik (732) 932-9400 ext. 339 (e-mail mkarasik@aesop.rutgers.edu). □

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.rcrc.rutgers.edu/soiltest-inglab> 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. □

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.rcrc.rutgers.edu/plantdiagnosticlab> or call the lab at 732-932-9140, fax 732-932-1270 or e-mail clinic@rce.rutgers.edu. □

Weather Summary for the Week Ending 8 am Monday 9/17/ 7

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
CANOE BROOK	.91	43.44	15.41	84	43	65.	1	2996	519	85
CHARLOTTEBURG	.56	31.16	2.85	83	40	62.	1	2591	624	74
FLEMINGTON	.97	33.83	6.99	87	39	64.	0	2825	286	85
NEWTON	.56	27.92	1.83	82	40	62.	1	2557	336	76
FREEHOLD	1.07	32.86	6.76	87	41	66.	1	3079	388	82
LONG BRANCH	.78	31.90	5.46	79	48	65.	-1	2835	201	71
NEW BRUNSWICK	.75	38.22	11.73	83	43	65.	-1	2997	169	82
TOMS RIVER	.69	26.94	-.08	85	43	66.	0	2903	264	66
TRENTON	.52	27.50	2.42	91	45	67.	0	3142	208	60
CAPE MAY COURT HOUSE	1.66	18.23	-5.19	87	45	69.	0	3040	386	97
DOWNTOWN	.39	20.26	-4.36	88	43	67.	0	3150	205	57
GLASSBORO	.55	24.26	-1.56	89	49	68.	1	3449	535	62
HAMMONTON	.37	20.51	-5.29	91	44	68.	1	3242	319	53
POMONA	1.29	22.18	-1.35	89	46	68.	3	3181	454	91
SEABROOK	.45	21.61	-2.05	89	45	68.	0	3457	494	56
SOUTH HARRISON	.51	24.50	-0.84	89	48	68	NA	3341	NA	NA
WES KLINE -- GDD BASE 40 PINEY HOLLOW	LAST WEEK 236 (Ending 9/10/07) THIS WEEK 189 (Ending 9/17/07)									

Eligibility for Deer Fencing Program Expanded for 2007

New and beginning farmers will have an opportunity to participate in the New Jersey Department of Agriculture 2007 Deer Fencing program, a cost-share program that provides fencing material and up to 30 percent of the line posts to qualified farmers. The program, run cooperatively by the Department and Rutgers NJAES Cooperative Extension, has expanded eligibility to new and emerging operations that could benefit from the exclusionary fencing. The new/beginning farmer category is only eligible to farms established from 2000 through the present day which meet an economic threshold.

"The fencing program has successfully assisted participating farmers in minimizing deer damage to crops over the past two years," said New Jersey Secretary of Agriculture Charles M. Kuperus. "This year, we hope to help newer farmers trying to establish their crops as well as long-time farmers keep deer and other animals out of their fields so they can benefit from higher yields and ensure the viability of New Jersey's farms." This is the third year of the Department's deer fencing program. In the first two years, fence, accompanying wire and posts were distributed to 150 farmers throughout the state.

A Rutgers NJAES Cooperative Extension survey of farmers who participated in previous deer fencing programs indicated that almost 70 percent of wildlife crop loss is attributable to deer. The New Jersey Agricultural Experiment Station estimates the economic loss to farmers to be between \$5 million and \$10 million annually. To participate in the program, farmers must meet these eligibility criteria:

- Farmers who were awarded fencing and materials in the **2004/2005 or 2006 program are not eligible** to participate
- Must be a New Jersey farmer having documented proof of a **minimum of \$40,000 in sales** of agricultural commodities produced by the applicant on a New Jersey farm, or
- Must be a New Jersey **certified organic farmer** having documented proof of a **minimum of \$20,000 in sales** of agricultural commodities produced by the applicant on a New Jersey farm, or
- Must be a **New/Beginning farmer** actively engaged in production of agricultural commodities on a New Jersey farm that was established from 2000 through the present day and have documented proof of a minimum of \$5,000 in sales of agricultural commodities produced by the applicant on a New Jersey farm
- Must be the owner of the land or have documented proof of renting preserved farmland or farmland that is enrolled in an **Eight-Year Farmland Preservation Program**

Announcing Green Energy Website for Farms and Greenhouses

The UMass Extension Vegetable and Floriculture Programs are excited to present the addition of "Renewable Energy for Farms and Greenhouses" to their websites. The pages are designed to provide a practical and reliable resource base for farmers and growers on using renewable energy including solar, wind, biomass, and geothermal technologies. With high fuel prices, decreasing consumption of fossil fuels is an important step you can take to ease your wallet and to reduce greenhouse gas emissions. The site is arranged to be a guide for the process of adding green energy; it provides resources on the different types of energy, tax incentives, finding a contractor, and energy efficiency. There is also a page that lists Massachusetts farms and greenhouses that are using green energy. Visit the website by going to www.umassvegetable.org or <http://www.umass.edu/umext/floriculture/> and clicking on the "Renewable Energy" link. □

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- Complete a **mandatory deer fence installation workshop** sponsored by the New Jersey Department of Agriculture (NJDA) and Rutgers Cooperative Extension

Farmers who receive fencing and materials will be required to use the material solely for the purpose of keeping deer off their land and are prohibited from using the fence to contain equine, livestock, poultry, or other animals. Any unused fence will have to be returned to NJDA and cannot be sold.

Applications for deer fencing are available to farmers through the New Jersey Department of Agriculture, Soil Conservation Districts and Rutgers Extension offices. **Applications must be postmarked by October 8, 2007.** Farmers also may call (609) 292-5532 for more information or go to the NJDA website deer fencing page at www.nj.gov/agriculture/grants/deer.html. □

