Getting ready for summer

by Wendy Gelernter, Ph.D. and Larry J. Stowell, Ph.D.

Bottom line: We have assembled below some information on turf diseases, insects, water management and soil management that may be of use as the weather begins to warm up.

Turf diagnostic lab listing

If you are in any doubt about the identity or cause of a turf problem, we highly recommend the use of a qualified turf diagnostician. Fortunately, there are several good labs around the U.S. who provide this service. Check with your local land grant university and/or county extension agent for information on regional diagnostic laboratories. If none are available, the following labs provide nationwide services for reasonable fees. Labs should be contacted prior to sample shipment for specific preparation and shipping instructions.

Dr. Frank Wong
University of California, Dept of Plant Pathology
Riverside, CA 92521
PHONE: 909-315-1010
Service offered: ID of turf diseases

Dr. William Crow
Dept of Entomology and Nematology
Univ. of Florida
PO Box 110620 Gainesville
FL 32611-0620
PHONE: 352-392-1901 x 138
Service offered: ID of plant parasitic nematodes
http://edis.ifas.ufl.edu/sr011

Dr. Lane Tredway
North Carolina State University
Plant Pathogen Identification Lab
Campus Box 7211
1104 Williams Hall 100 Derieux Place
Raleigh, NC 27695
PHONE: 919-515-3619
Service offered: ID of insect and disease pests
www.ces.ncsu.edu/depts/ent/ppil/lab.html

Dr. Phil Colbaugh
Texas Agricultural Experiment Station, 173 Coit Road
Dallas, TX 75252
PHONE: 972-952-9630
Service offered: ID of turf diseases
www.colbaugh-turf.com/

Dr. Joe Vargas and Ron Detweiler
Michigan State University 102 CIPS
East Lansing, MI 48824-1311
PHONE: 517-353-9082
Service offered: ID of turf diseases
www.msu.edu/user/karcherd/Turfpals.html#Turfgrass_Pathology_Lab

Richard Buckley
Rutgers Cooperative Extension
Plant Diagnostic Laboratory
P.O. Box 550
Milltown, NJ 08850-0550
PHONE: 732-932-9140
Service offered: ID of turf diseases
www.rce.rutgers.edu/plantdiagnosticlab/default.asp

Fusarium patch (aka pink snow mold)

Although fusarium patch (caused by *Microdochium nivale*) is usually a cool season disease, this fungus can still cause damage when average air temperatures rise above 62 F — if conditions are still moist. Keep an eye out for this disease and treat using any of a variety of the fungicides that are active on this disease. One of the most effective combinations is propiconazole (e.g. Banner Maxx 2 oz/1000) in combination with chlorothalonil (e.g. Daconil Ultrex 3.2 oz/1000 sq ft). Most diseases that occur during the spring and summer will be suppressed by this combination. Many other products (see page 16 of your PACE Turf Management Reference booklet) are also labeled for this disease. If weather conditions warm up and dry out, additional applications for fusarium patch will be unnecessary.

Pink snow mold on poa green (left) and on a bentgrass green sample (right)

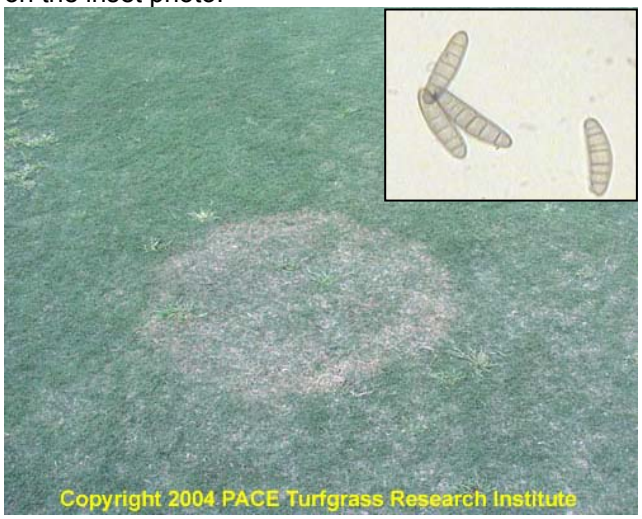
Springtime diseases

As spring approaches, we see buds breaking, leaves growing and flowers - well… flowering. On the darker side of spring are the turf diseases that will begin to consume the new foliage and roots as fast as they can. In addition to the usual suspects — dollar spot, brown patch and fusarium patch — fairways suffer this time of year from a variety of diseases ranging from brown patch to bipolaris crown rot. Bipolaris crown rot appears to be an increasing problem throughout the country. Patrick O'Brien, USGA

Southeastern Regional Agronomist, reports that bipolaris caused serious problems on fairways that were stressed by shade or cool weather. Unfortunately, bipolaris symptoms and brown patch symptoms can be easily confused, and the two pathogens may sometimes even occur together (see photos below). For this reason, it is always a good idea to have a diagnostician look at your samples. On the bright side, both diseases are controlled by many of the same fungicides including iprodione and vinclozolin (see your PACE Reference booklet, page 16, for a full listing of labeled products)

Brown patch (Rhizoctonia spp.) on a bermudagrass fairway.

Bipolaris crown rot plus **Brown patch** on a bermudagrass fairway. Bipolaris spores are pictured on the inset photo.



Localized dry spot

During the springtime, cases of localized dry spot (LDS) become more frequent. Localized dry spot refers to a specialized condition caused by hydrophobic (water-repellent) soils that develop 1 - 6 inches underneath the turf surface.

The dry soils develop due to the production of waxy materials and/or fungal mycelia which coat sand particles and make them water repellent. The waxy, organic materials (thought to be related to humic and fulvic acids) are believed to come from a variety of sources including breakdown products of turf itself (including thatch, roots and leaves) and of organic amendments. Several different microbes, including fairy ring fungi, are believed to produce these waxy materials as well. In many cases, LDS and fairy ring are intimately connected, and treatment of both problems (usually with fungicides such as ProStar/flutolanil, Heritage/axozystrobin or Insignia/pyraclostrobin) is necessary to clear up the symptoms. However, there are cases of LDS where fairy ring fungi cannot be detected. In those cases, treatment with a wetting agent and the cultural practices below are usually sufficient to clear up the symptoms.

It is likely that all sand greens experience LDS to some extent, especially in their first few years of life. However, there are some factors that encourage more rapid development of LDS on new greens including:

- use of coarse textured sand (0.5 - 1-mm diameter). This is due to the poor water holding capacity of coarser soils
- thick thatch layers are believed to harbor the microbes that cause LDS
- newer greens (6 - 18 months old) are most susceptible to LDS
- creeping bentgrass, followed by Tifgreen bermudagrass are the most likely turf varieties to suffer from LDS
- the use of organic amendments during construction, such as peat, appears to encourage the development of LDS
- extended drying periods appear to increase the severity of LDS symptoms

Managing LDS:

- maintain thatch thickness below 1/2" by regular verticutting, aerification and topdressing
- use wetting agents such as Respond or Primer to alleviate symptoms of LDS
- use fungicides such as Prostar (flutolanil) 70 WP (4.5 oz/1000 sq ft), Heritage (azoxystrobin) (0.4 oz/1000 sq ft) or Insignia (pyraclostrobin) (0.9 oz/1000 sq ft) if fairy ring fungi are causing the LDS symptoms. Addition of a wetting agent to the spray tank will usually improve the control of symptoms. Products should be watered in. Fungicide applications usually begin in the springtime, after early symptoms are first detected. Two or three monthly follow-up applications are usually necessary.
- implement a spring cultivation program (based on core aerification, topdressing and deep tine

aerification) to reduce compaction, break up hydrophobic soil aggregations and improve turf health.

- Re-wet hydrophobic soils via hand watering, or through the use of equipment such as a water fork

This profile of a soil with LDS shows a dry area in the top few inches of soil. The dry area has been colonized by hyphae of fairy ring fungi, which make the soil hydrophobic (water repellent).

Algae Management

Cyanobacteria (algae) continue to inflict damage to bentgrass, bermudagrass and poa greens. These microorganisms can be controlled using chlorothalonil (e.g. Daconil Weather Stik at 3.6 oz/1000 sq ft applied in 2 gal/1000 sq ft). Refer to page 16 of the PACE Turf Management Reference booklet for other chlorothalonil product trade names. Regular applications will be needed until symptoms subside – normally at least three applications applied on a 14 day schedule. For more information on the cyanobacteria, refer to PACE Insights Volume 6, Number 8.

New USGA recommendations for putting green construction

The USGA has recently released new construction guidelines for greens construction. The new guidelines relax some of the particle size specifications to allow for a wider range of source materials in greens construction without compromising performance of the final product. Some of the changes include:

- Bridging factors and uniformity factors have been widened for gravels that can be used without the inclusion of an intermediate layer.
- There is less focus on saturated hydraulic conductivity in this specification with the guideline set at a minimum of 6 inches/hr.
- The new specification allows the use of calcined clays, calcined diatomites, and zeolites in place of or in conjunction with peat in root zone mixes as long as all of the particle size and performance guidelines are met. This is a big advantage for high rainfall areas such as the Southeast. Polyacrylamides and reinforcement materials are not recommended.

The full document can is on the USGA's website at: www.usga.org/turf/course_construction/green_articles/putting_green_guidelines.asp.

A new look at calculating calcium requirements

Over the past few years, we have been viewing soil sodium levels as increasingly important values to track in soil reports. In the past, the general consensus has been that keeping soil calcium at levels that occupy 68% or more of the exchange sites (BCSR method) would automatically keep sodium low enough so that only 6% or less of the soil exchange sites were occupied by it. However, in some soils, it is difficult to accurately assess how much calcium is present, and as a result, sodium levels can invisibly creep higher and higher, causing more and more damage.

We have recently encountered several situations where calcium **seems to be** higher than 68% of the exchange, but where sodium is also excessive. Upon further investigation, this seems to happen most frequently in soils that contain free lime (calcium carbonate). In these systems, artificially high calcium levels can result if the Melich III acid extraction system is used in the analysis (The Melich III extraction dissolves some of the calcium from the calcium carbonate to result in an artificially high soil calcium level). In other words, if your soils contain free lime, you may be seeing inflated calcium levels in your soil reports — levels that appear to be sufficient for keeping sodium off of the soil exchange sites — but in fact are not.

As an alternative to looking only at calcium levels, we are also beginning to look directly at sodium levels. In most cases, maintaining sodium below 110 ppm (modified SLAN method) will help to avoid sodium-related damage to turf and to soil physical structure. To interpret soil sodium levels on your soil report:

1) Determine how much excess sodium is present in your soil by subtracting **110 ppm sodium** from the reading on your soil report.
For example, if your soil contains 150 ppm Na, your soil contains 40 ppm more (150 ppm – 110 ppm) sodium than is desired.

2) To compute how much excess sodium is present in terms of milliequivalents/100 g soil, divide the excess amount of soil by 23.
40 ppm Na/23 = 1.7 meq excess sodium/100 g soil

3) Use the milliequivalent value to calculate the amount of calcium (Ca) needed to displace the sodium, so that (Ca meq/100 g) X 20 = Ca ppm
(1.7 meq Ca/100g) X 20 = 34 ppm Ca needed to displace sodium

4) To convert to pounds per acre, multiply by 2:
34 ppm Ca X 2 = 68 lbs/acre calcium needed to displace sodium

5) To convert pounds per acre to pounds per 1000 sq ft, divide by 43.65.
(68lb/acre)/43.65 = 1.6 lbs Ca/1000 sq ft needed to displace 40 ppm sodium

6) A shortcut to steps 2 -5 is to multiply the excess Na ppm value by 0.04 to obtain pounds Ca/1000 sq ft needed to displace excess sodium
40 ppm X 0.04 = 1.6 lbs Ca/1000 sq ft needed to displace sodium

7) To determine how much of a calcium amendment is needed to provide the desired amount of calcium, divide by the proportion composition of the product.
For example, gypsum typically contains about 23% calcium. Therefore a requirement for 1.6 lbs Ca/1000 sq ft will require:
(1.6 lb Ca/1000 sq ft)/0.23 = 7 lbs gypsum/1000 sq ft required to displace 40 ppm sodium

It is important to remember that calcium is also required as a plant nutrient (at levels of 750 ppm in the soil), in addition to its value as a tool for managing sodium. When calculating calcium requirements, keep both the sodium management and plant nutrition requirements in mind.

Proactive irrigation to avoid drought stress

As warm temperatures approach, the weather becomes more changeable and unpredictable, and we frequently see short bursts of abnormally warm, sunny and dry weather. These conditions are perfect for the development of drought stress and anthracnose — especially on poa greens.

This occurs because the early warm weather brings on a sudden (and frequently unexpected) increase in the plant's demand for water (evapotranspiration). If irrigation schedules are not modified to compensate for the heat, drought stress will result. Drought stress is particularly harmful during the springtime because the turf has just begun its period of rapid growth after the long winter. The drought stress can in turn weaken the plant to the point that it is more susceptible to diseases such as anthracnose. This sequence of events is most common for the shallow-rooted poa. Deeper rooted varieties such as bentgrass and bermudagrass are not as sensitive to fluctuating environmental conditions and therefore can avoid many of the stress-related diseases that can result during periods of abnormally warm weather.

How can you be more proactive and avoid this early spring drought stress syndrome? If your weather station records evapotranspiration, adjust your irrigation cycles to compensate for higher than normal ETs. Keep good track of daily average air temperatures, and think about increasing run times if there are spikes of higher than normal temperatures. Check soil moisture levels frequently at several depths — remember that for poa plants, sufficient moisture in the top 2 -3 inches of soil is the most important for turf health. And if you are getting ready to go on vacation, leave behind detailed instructions for monitoring weather, irrigation and soil moisture.

It's never too early for white grubs

After their winter time hibernation, masked chafer grubs begin to become active again when soil temperatures warm up to 65F and higher. In some years, these late-stage grubs can cause some damage in the late winter/early spring before they pupate in the soil. Unfortunately these large grubs are quite difficult to control. If they are causing damage (or if animals digging for them are causing damage), the two most effective options are either acephate (Orthene) or carbaryl (Sevin). It's very important to water these products in so that they reach the root zone where grubs are active.

On warm, sunny days during the early spring, the presence of hordes of black turfgrass ataenius beetle adults on greens causes a flurry of alarm. In most cases, though, there is little cause for concern. Abnormally warm weather will cause many adults to awaken from their winter time inactivity. But the soil temperatures are usually still too cool for eggs and damaging small grubs to develop (remember, ataenius adults do not feed on turf and therefore cause no direct damage). In most cases, the adults can be ignored (if you can bear it). However, if the adults are causing serious nuisance problems OR if soil temperatures have been greater than 60F for more than a month at the time that you see the adults, you may want to consider the use of an adulticide. Products with good activity on ataenius adults include chlorpyrifos (Dursban, Pageant); bifentrhin (Talstar), cyfluthrin (Tempo), deltamethrin (Deltagard) and lambda cyhalothrin (Scimitar). If you decide to apply an adulticide, you will probably still need to apply a preventive application of either imidacloprid (Merit) or halofenozide (Mach 2) later in the spring to prevent later generations of ataenius from invading your turf.

Black turfgrass ataenius adults

Masked chafer grubs feed on turf roots in the late spring just prior to pupating in the soil.