Calendar of Events

Rutgers Turfgrass Research field Days
July 28, Wed.-Lawn & Landscape Section - Adelphia
Research Farm. Reg. 8am $35 reg. includes lunch at 12. –
Tour 9am-3pm. Note: First 50 registrants receive a free cap.

July 29, Thurs. - Golf & Fine Turf Research Section –
Hort. Farm II-Ryder’s Lane, North Brunswick. 8:30am
$35 reg. includes lunch at 12:30. – Tour 9:30am-3pm
Pesticide Recertification Credits Offered On Both Days.
FOR INFORMATION CALL: Dick Caton (856) 853-5973
Marlene Karasik (732) 932-9400 Ext. 339

14th Annual IANJ Golf Tournament
August 16, Mon. at Royce Brook Golf Club, Somerville.
Reg. $40 members, $50 non-members Reg. 7:30am, begins
8am-4pm, includes BBQ lunch See front page for details.
FOR MORE INFORMATION CALL (808)730-7770.

SFMANJ Third Annual Outdoor Fall Field Day/Trade
Show/Equipment Demonstration Day
August 17, Tues. – Plainsboro Twps. Community Park,
Reg. $40 members, $50 non-members Reg. 7:30am, begins
8am-4pm, includes BBQ lunch See front page for details.
FOR MORE INFORMATION CALL (808)730-7770.
Participating organizations are NJTA, NJLCA, IANJ.

New Jersey Recreation & Parks Assoc. Playground
Safety Course
For more information call Bill Foelsch (732)568-1270

Letter from the President
I am very excited to say that our 2003/2004 Membership
Recourse Directories have been mailed out. The main person
from each organization or company should have received a
copy. Because of the high cost in producing the directory, we
limited it to the first paying member. If you want more copies
we would be happy to send you one for a fee of $12.00. If you
need a replacement binder there will be an extra charge of
$4.00.

Please use this directory to find the products and equipment
you need. I encourage you to support our member vendors.
Look for fellow sports field managers and professionals to
reach out to with your turf problems and product searching.
This book is a one-stop shop.

If you did not see your name in the directory, it may be
because you did not become a member or renewed your
membership in time for this printing. We will send everyone an
update in October with any errors and new members. If you
are not sure, please call the office or e-mail us at hj@sfmanj.org
or (908)730-7770.

Also, I hope you take advantage of the Fall Demo/Trade
Show/Education field day on Aug. 17th. Check out the
information in this newsletter, sign up now or call if you have
questions. This will be our biggest field day ever with the
inclusion of NJTA, NJLCA AND IANJ. There will be something
for everyone.

Eleanor Murfitt-Hermann

“Rutgers Corner”
Soil pH and Use of Lime
*by Brad Park, Rutgers
Universitypark@acsop.rutgers.edu

Unfortunately, lime is often applied annually to sports
fields for no other reason than, “We’ve always done it that
way.” Conversely, some sports field managers are reluctant
with the application of a soluble nitrogen fertilizer. The
purpose of this edition of Rutgers Corner is to discuss the
concept of soil pH and describe how to utilize liming materials
to correct low pH soils.

The basics of soil pH

All soils can be classified as acidic, neutral, or alkaline.
Acidity and alkalinity are defined in terms of the hydrogen
ion (H+) concentration found in pure water. If the soil solution
contains more hydrogen ions than are found in pure water,
the soil is considered acidic. In contrast, if the soil solution
contains fewer hydrogen ions than are in pure water, the soil
is considered alkaline. The degree of acidity or alkalinity
can be described by a pH range from 0 to 14. Any value
below 7.0 is considered acidic; a value of 7.0 is neutral; a
value above 7.0 is considered alkaline.

In humid, high-rainfall regions such as New Jersey, soils
become acidic through natural processes and human activities.
Rainfall will leach elements from the soil such as calcium
and magnesium deep into the soil profile and replace them
with hydrogen ions from the water. Additionally, use of
ammonium-based fertilizers and acid rain contribute to the
creation of acidic soils.

Soil pH affects turfgrass health by influencing the
availability of plant nutrients as well as elements that can be
detrimental to turfgrass vigor. Soil pH can also affect the
susceptibility of turfgrasses to certain diseases. Strongly
acidic soils (pH ≤ 5.5) may lead to deficiencies in calcium,
magnesium, or phosphorous and increase the availability of
elements such as aluminum to levels that are toxic to
turfgrasses.

In strongly alkaline soils (pH ≥ 8.5), phosphorous can
be unavailable to the plant. Interestingly, research has shown
that soil pH values above 6.5 appear to enhance summer
patch disease development. Kentucky bluegrass is a widely
used cool season turfgrass for sports fields in New Jersey
and many varieties are susceptible to summer patch. Annual
bluegrass (Poa annua), while generally considered a weed,
is often a species found on sports fields and is also susceptible
to summer patch. Repeated annual liming can potentially
predispose Kentucky bluegrass (and annual bluegrass) sports
fields to summer patch, which can devastate a turfgrass
playing surface.
To lime or not to lime ... 

To determine whether or not to apply lime to a sports field a soil test must be performed. Soil testing kits may be purchased from a Rutgers Cooperative Extension county office. Each kit includes an information sheet, a questionnaire, and a mailing bag or envelope. The information sheet provided with the soil testing kit describes proper sampling procedures. Additionally, the January/February 2004 issue of SFMANJ Update contains a fine article authored by Clare Liptak detailing the procedures for collecting a soil sample and other rationales for conducting a soil test.

In a standard soil test, the plant nutrients boron, calcium, copper, magnesium, manganese, phosphorus, potassium, and zinc are quantified to determine their availability to a crop, in this case turfgrass. Fertilizer and lime requirements recommended by the Rutgers Soil Testing Laboratory are based on soil nutrient levels, pH, and in some cases, crop management and site conditions.

Optimally, lime should be applied as part of the turfgrass establishment process, prior to finish grading and turfgrass seeding. Lime should be tilled to a 6-inch depth based on soil test recommendations. In the case of established turfgrass, lime should not be applied in excess of 100 pounds per 1000 square feet.

Very simply, if the results of soil testing determine that a lime application is needed - apply a liming material. If no lime is required - don’t apply lime.

Choosing a liming material

When a lime material is applied to soil, it has the effect of neutralizing soil acidity. Calcitic limestone is often referred to as “regular” limestone and is nearly pure calcite or calcium carbonate (CaCO₃). Dolomitic limestone is a mixture of calcium carbonate and magnesium carbonate and can be used when pH is determined to be low and deficient levels of magnesium exist.

Ground agricultural limestone can be used to correct soil pH in turfgrass areas. Depending on the fineness of the material, it may be difficult to spread ground agricultural limestone using a drop spreader because finely ground particles may bridge over the application holes in the spreader. Spinner-type spreaders can be used to apply ground agricultural limestone, however bridging problems may also occur if the hopper is not properly agitated. Because of application problems, pelleted limestone is often applied to turfgrass. Pelletized lime is calcitic or dolomitic ground agricultural limestone that has been aggregated into larger particles to allow for easier spreading through conventional drop and spinner-type spreaders.

Note that the particle size of a liming material will strongly influence the rate in which the material neutralizes soil acidity. While all liming materials are relatively insoluble, materials with finer particle sizes (greater surface area) have an increased dissolution rate in continued on page 12
"JUST ADD WATER..."

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continued from page 5

soils, and therefore will have the effect of neutralizing acidity more quickly than a coarser grade lime source.

Burned lime and hydrated lime are other liming sources. These materials are not generally recommended for use in turf because of their caustic properties for applicators and their potential to cause burn on turfgrasses.

Calcium carbonate equivalent (CCE)

The lime requirement given in the soil test results by the Rutgers Soil Testing Laboratory and other labs is based on the use of pure calcium carbonate, which is assigned a relative neutralizing value of 100%. Therefore, a liming material that has the same neutralizing potential as pure calcium carbonate is said to have a calcium carbonate equivalent (CCE) of 100%. If, however, the CCE of the liming material chosen does not have a CCE of 100%, the amount of material to be applied must be adjusted to raise the soil pH to the desired level.

For turfgrass sites, lime requirements made by the Rutgers Soil Testing Laboratory are based on pounds of limestone (CCE=100%) required on a 1000 square foot basis necessary to raise soil pH to 6.3.

Based on the CCE of the material being used to lime a turfgrass area, the amount of material needed can be calculated in the following manner:

Liming material needed = (Soil test recommendation/CCE of liming material) X 100

Tying it all together

An example of a soil test recommendation for the establishment of a sports field based on a determined soil pH of 5.35 is as follows:

The soil test indicates a strongly acidic soil, of which the pH is below the best range for the growth of most turfgrass. This soil should be treated with 95 pounds per 1000 square feet of limestone. Spread uniformly on the surface, then mix thoroughly to a 6 inch depth by shoveling or tilling.

In the case of this example, if the liming material available for use has a CCE of 85%, then the actual amount of material needed to be applied per 1000
square feet based on the lime recommendation is: \((95/85) \times 100 = 112\) lbs liming material per 1000 square feet.

In the case of established sports fields and other turfgrass sites, lime requirements are often specified such that the amount of lime required is applied over multiple applications.

**Literature cited**


Murphy, J. and J. Heckman. Managing soil pH for turfgrasses. Rutgers Coop. Ext. FS 635.


*Brad Park is the Sports Turf Research & Education Coordinator for the Department of Plant Bio/Pathology, Rutgers University.*

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*July/August 2004*