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 or Marlene Karasik (732)932-9400 Ext. 339

14th Annual IANJ Golf Tournament
August 16, Mon. at Royce Brook Golf Club, Somerville. Reg. 10:30am, lunch 11am -1pm, start 1pm, Dinner/awards 7pm. Cost: $175 per person, $75 non-golfer. Deadline Aug. 2. Call (973)379-1100

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-4-m, includes BBQ lunch See front page for details. FOR MORE INFORMATION CALL (908)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 2003/2004Membership 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 hq@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. ◆

Eleanora Murfitt-Hermann

"Rutgers Corner"

Soil pH and Use of Lime

***by Brad Park, Rutgers**
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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 to apply lime or skeptical of the benefits of applying lime because turfgrass will not show an immediate response to a lime application, in contrast to the rapid growth associated 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 ($pH \leq 5.5$) 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 ($pH \geq 8.5$), 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 ($CaCO_3$). 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, pelletized limestone is often applied to turfgrass. Pellitized 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

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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)X100 = **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

Carrow, R.N., D.V. Waddington, and P.E. Rieke. 2001. Turfgrass soil fertility and chemical problems. Sleeping Bear Press, Chelsea, MI.

Landschoot, P. 1994. Liming turfgrass areas. Penn State Col. Of Ag. Sci., Ag. Res. and Coop. Ext. Extension Circular 415.

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

Plaster, E.J. 1992. Soil science and management. Delmar Publishers, Inc., Albany, NY.

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