

## “Give It What It Needs”

‘Using Soil Test Results to Develop a Fertility Strategy’ by Jim Hermann

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As previously discussed, soil test results provide the basic information necessary to maintain optimum soil fertility. Soil test results should be considered a barometer of the effectiveness of your fertility program.

Along with soil pH, these results quantify and rate the availability of the major nutrients, P, K, Mg, & Ca. The rating system is generally divided into 5 levels of availability such as low, medium, good, optimum, and above optimum. It is important to recognize these availability ratings when formulating a fertility strategy.

If the soil pH is less than optimum you will be given a lime recommendation. Lime can be applied at any time of year. For ease and effectiveness, pelletized lime should be considered. If large quantities of lime are required, bulk applications are the most cost effective. Due to the gross weight of the vehicle, an application of this nature should only be anticipated when the ground is extremely dry or frozen. It should be noted that applications made on frozen ground have the potential to cause some temporary turf damage. This localized damage is caused by the weight of the vehicle breaking off or in some way causing damage to the frozen blades of grass. This will cause the tire tracks to turn brown and remain unsightly until new growth occurs in the spring. If the area to be limed is small or the amount of lime needed does not justify a bulk application, bagged material can be applied utilizing a tractor mounted spreader or walk behind unit. Trust me, a walk behind spreader is not the way to go.

If calcium levels are below optimum, but the pH is optimum, gypsum is sometimes recommended as a source of calcium.

Along with lime or gypsum, a recommendation is made for fertilizer. Nitrogen, phosphorous, potassium and magnesium (if needed) are typically included in this recommendation. Rates may vary depending on the maintenance level or status of the turf, such as new seeding, established turf etc. The results should also state if phosphorous and potassium can be applied as a single application or be split. Generally speaking, once P & K receive a “high” or “optimum” rating in the soil any P & K recommendation is considered a maintenance application and can be applied in one application.

Fertilizer recommendations are generally given as a yearly turf requirement. It is then the job of the turf manager to determine the basic formulation of the fertilizer and also the seasonal nutrient requirements of his/her turf program.

The easiest way to establish a fertilizer formulation is to contact a reputable fertilizer dealer and supply him with a copy of your soil test results. There are standard formulations available through any dealer, which can readily be adapted to your program. Rutgers Soil Testing Laboratory will provide in its test report some example fertilizer grades (formulations) that meet the requirements for balancing soil fertility. It is however, the responsibility of the turf manager to familiarize

him/herself with typical nutrient sources along with the benefits and potential cost differences. As an educated consumer you will be better equipped to make budgetary decisions based on the information provided to you.

Intensely used turf such as athletic fields should be fertilized a minimum of three times a year. An easy way to remember timing is Memorial Day, Labor Day and Thanksgiving. These three holidays coincide reasonably well with the appropriate timing for fertilization.

When developing your fertility strategy it is essential to remember the important functions of the major fertilizer components. N-P-K, nitrogen, phosphorous, potassium, up, down, all around. Nitrogen: up, top growth. Phosphorous: down, root development. Potassium: all around, stress tolerance. (This is an over simplified, and therefore limited description of plant nutrition).

Your fertility program should be designed to give the turf what it needs, when it needs it without over stimulating or promoting unnecessary top growth. As has been stated, nitrogen stimulates top growth. Four pounds of nitrogen per thousand square feet, per year is a good ballpark figure (get it “ball park?”). Turf should receive most of its nitrogen in the fall. It should be understood at this time that every program should be site specific. Adjustments may need to be made based on usage and or budget.

### **Fertilizer selection:**

The source of nutrients in a fertilizer is a large portion of what determines cost. Different nutrient sources have different release patterns. These differences have the potential to greatly affect cost and effectiveness. It should not be assumed however that a fast release product is somehow inferior to a slow release product. Release pattern is entirely relative to desired effect and should therefore be of major concern when determining the components of your fertility program.

Another cost factor is the percentages of nitrogen, phosphorous and potassium. A higher percentage of these nutrients will normally increase cost, however keep in mind you use less pounds of product and may be able to apply less frequently (less labor).

Although not usually considered, the source of potassium can also affect cost. The two products most widely used as granular sources of potassium in agriculturally oriented fertilizers are Sulphate of Potash, which is not as “salty” and generally more expensive per unit of potassium than Muriate of Potash, which has a higher salt index but somewhat less expensive per unit of potassium.

Fertilizer salt index is typically not a major consideration unless the EC (electrical conductivity) of your soil has been tested and existing salt levels are considered too high. The other consideration for a high salt index would be when you are using high rates of fertilizer that can stress (burn) your turf if care is not taken to wash in the fertilizer with rain or irrigation. *Cont.*

In general, no more than 1 pound of nitrogen per thousand square feet should be applied at one time using a fast release product. Note: Typically, fertilizer applications should only be made when environmental conditions favor turf development. Some fertilizer components are highly volatile and can lose 25 – 30% of their effectiveness if not watered in within a reasonable period of time.

Iron is a component of some fertilizer formulations. It is one of the soil micronutrients and is typically readily available in most soils. Additional iron however does have the ability to stimulate a greener turf without creating excessive growth. Use of iron in an athletic field management program should in most cases be considered purely discretionary and not absolutely necessary.

### Application Timing

Spring (Memorial Day):

If your turf received a late fall (Thanksgiving) application of fertilizer it should break dormancy, green up and have a surge of growth which will typically last thru April into early May before slowing down to a manageable rate of growth. It is at this time that you want to give the turf a little boost (I didn't say shove) to help it through the stress of summer.

In the spring, the turf is using up nutrients it stored over the winter to push top growth. This green top growth is necessary for the manufacture of carbohydrates. The leaf produces these carbohydrates for the survival of the plant but must supply its own needs first. Any additional carbohydrates are then translocated to the roots to maintain the health of the plant. Over stimulation of the top growth caused by excessive nitrogen can cause an imbalance. The turf cannot produce enough carbohydrates to supply both the leaf and the roots so the root system suffers and less root development may occur. Reduced rooting decreases the ability of the turf to withstand the stress of summer. Generally ½ to ¾ lb. N (50% slow release) per thousand square feet is adequate to supply the needs of the plant. Turf color and growth intensity can be good indicators, and should be used as a reference for nitrogen requirements at this time of year.

The concept of conservative spring fertilizer goes against reason. You would think that after winter dormancy it would benefit the turf to receive a substantial application of fertilizer when in reality, within limits, less is better.

In addition to nitrogen, if phosphorous or potassium levels are less than optimum ask your fertilizer supplier for a formulation that will also supply 1/3 to 1/2 the yearly P & K recommendation.

### Early Fall (Labor Day)

Typically, at this time of year the nights are cooling down and the turf has started to come back after the summer stress period. Now is when the turf starts to build up its reserves for the next season. At this time of year the turf generally shifts its growth pattern to more lateral

development. Now is when you can give it a shove instead of a boost. 1½ lb. N (50% slow release) per thousand square feet along with 1/3 to 1/2 the yearly P & K can be applied at this time.

### Late Fall (Thanksgiving)

At this time of year the top growth has ceased but the root system is still continuing to develop. This application of fertilizer can also be timed for late October and early November.

Another 1½ lb. N (50% slow release) along with any necessary P & K will help prepare the turf for the next season. This application along with the September application will help develop a deeper and denser root system. This is a very important aspect of effective athletic field management.

It should be noted at this time that the example given is a ballpark maintenance program (last time, I promise). In a more intensely managed or irrigated situation, rates and timing can be adjusted to accommodate a higher degree of efficiency and or turf quality.

Your fertility program will only be as successful as your cultural practices allow it to be. Compaction can render a quality fertility program less effective. Effective and timely aeration, seeding and pest control are just as important and should not be overlooked when developing an overall management plan.

***This subject will again be addressed at our "Spring Problem Solving Field Day", on April 3<sup>rd</sup>, at Plainsboro Township Community Park. ;)***

If you have any questions or comments (good or bad) on this or any other articles that have been submitted, you can e-mail your comments to jimtc@worldnet.att.net or fax us at (908) 236-9118.

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**Did You Know?** A seed mix that is 10% bluegrass by weight can be as much as 50% bluegrass by seed count. Example: A pound of bluegrass = approx. 2 million seeds where a pound of tall fescue = approx. 220,000 seeds, perennial rye = approx. 250,000 seeds.