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### **“On the Subject of Soil Fertility”**

*by Jim Hermann, CSFM*

Over the course of my career in turf management, from my earliest involvement in residential turf to my current obsession with sports turf I have had the opportunity to use different nitrogen sources on different sites. I have experienced different results in different situations. The different results I have obtained were many times caused by a lack of understanding on my part on how the different nitrogen sources react in the soil and how the turf responds to their use. The objective of this article is to inform you of one such experience in the hope that you can possibly gain some useful information.

Nitrogen comes in different forms. There are liquids, granules, prills and powders. The bacteria in the soil can make some nitrogen sources available to the plant. Nitrogen can be cold-water soluble, warm-water soluble or water insoluble. It can be sulfur coated, polymer coated or combined with any number of products used to control the release pattern. It can have a lower salt index or a higher salt index. Some nitrogen sources are available to the turf almost immediately and others take years to become available. An understanding of the release characteristics of different nitrogen sources is essential in formulating a fertility program. It is the responsibility of the sports turf manager to select the most effective nitrogen source while taking into consideration objectives and existing conditions.

Choosing the best nitrogen source for a given situation or objective is not always as simple as it might seem. You can't assume that the most expensive source is the best nor can you eliminate the least costly from consideration. The nitrogen source you choose depends on what you want to accomplish. Before I discuss a situation I encountered this past season, I would first like to explain some of the objectives I am attempting to achieve in my fertility program.

My first priority is to address soil pH and apply any necessary lime based on a soil test. My second priority is to develop a plan to bring both potassium and phosphorous to optimum levels.

You can sometimes apply the entire amount of potassium and phosphorous recommended by a soil test in one application. This concentrates the fertilizer formulation on the potassium and phosphorous needs of the turf, with nitrogen as a secondary consideration. If you decide to apply all the phosphorous and potassium in one application, always be aware of the maximum amounts that can safely be applied without turf damage.

Another possibly more popular option is to use a product formulated with a nitrogen/phosphorous/potassium ratio such as 4-1-2, 4-2-2, 4-2-4 etc. that will supply your nitrogen needs along with fulfilling your potassium and phosphorous requirements over the course of an entire season, utilizing multiple applications. The seriousness of the individual nutrient deficiencies will sometimes determine your individual fertility strategy.

I personally prefer to address phosphorous and potassium needs independent of nitrogen. By addressing nutrient needs separately I have the ability to be more selective with the individual nutrient sources and select the source that I feel will work the best under the circumstances. I am therefore not dependent on standard fertilizer formulations that are sometimes formulated with nutrient sources I might prefer not to use at a particular time of year or for a particular purpose.

I am responsible for the turf management of a little league baseball field. I had a soil test completed on this field in July in preparation for the fall fertilizer program. The test results showed that the pH of 6.5 was adequate but showed a need for phosphorous in the amount of 50 pounds per acre and a need for potassium in the amount of 60 pounds per acre. Both levels were reported as good but not optimum. As I stated earlier, I strive for optimum levels of all major nutrients.

*Continued on next page..*



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were already falling below freezing and growth had slowed considerably. The time line discussed here may not coincide with fields located further south or in a warmer location.

After the last mowing I wanted to continue to promote root development and lateral growth with an application of nitrogen and remember, I still needed to address the potassium and phosphorous requirements of the soil as per my soil test. For this purpose I chose an agricultural grade 10-20-20 fertilizer to be applied at the rate of 1.5 lbs. potassium and phosphorous per thousand sq. ft. This rate would closely fulfill the potassium and phosphorous requirements along with giving me  $\frac{3}{4}$  lb. nitrogen per thousand square feet. By waiting until this time of year to address the potassium and phosphorous needs of the turf I was able to use muriate of potash as my potassium source. This product is less expensive per unit of potassium but has a higher salt index than some other potassium sources. I felt it would be safe at this time of year at this rate with no burn potential. The nitrogen in the 10-20-20 is all fast acting water-soluble nitrogen. Again, at this time of year at this rate I didn't feel there would be a problem. With cooler temperatures and higher moisture levels I wasn't as concerned with volatilization into the air or a slow release pattern as I would have been when the weather was warmer and drier. All in all I was able to use a relatively inexpensive product to achieve my objectives.

It is again important to realize that I was dealing with an established baseball field that would have 3 people in the outfield in the spring with minimal traffic. I might have elected to apply more than  $\frac{3}{4}$  lb. nitrogen at this time with some slow release if I were more concerned with early spring green up and growth as would likely be the case with a soccer field.

Although I may see some late season response from the nitrogen in color improvement and a small amount of growth, I won't know the total results of my late season fertilization until next spring. The turf likely used some of the nitrogen in the fall and some will be held in the soil for utilization in the spring. At any rate I don't anticipate the need for additional fertilizer on that field until mid May. Only a visual evaluation in the spring will tell the tale.

In closing I would like to suggest that if a person suggests to you that he or she could give you a product at a cheaper cost that would do the same thing, always consider the source. ▲

Note: The intent of this article is not to promote any one nutrient source as the best or to say one is superior to another. The intent is to give you different circumstances, and options available for satisfying the nutritional needs of athletic field turf. If you have an experience you would like to share or have any questions or comments contact me at [Jimtc@worldnet.att.net](mailto:Jimtc@worldnet.att.net) or (908) 236-9118

*Jim Hermann is President of Total Control Landscape & Athletic Turf Maintenance. He is also vice president of Sports Field Managers Association of NJ and co-editor of this newsletter. He recently became the second certified sports field manager in New Jersey.*

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