Does Fertilizer Source Affect Nutrient Loss?

Research has shown that a healthy stand of turfgrass can substantially reduce the loss of nutrients into ground and surface water. However, water quality and contamination from turf-applied fertilizers is increasingly in the forefront when it comes to turf management practices.

Researchers at Cornell University conducted a two-year field study to determine the effect of nutrient source on turfgrass runoff and leachate. Experimental plots were established (80:20 blend of Kentucky bluegrass and perennial ryegrass) on sloped sandy loam soil. Three natural organic (dairy and swine compost and a biosolid) and two synthetic organic nutrient sources (readily available urea and controlled release sulfur-coated urea) were applied periodically at rates of 1.0 and 2.0 lbs. N/1,000 square feet, for a total of 4 lbs. N per year. Runoff and leachate were analyzed for nitrate, phosphate and ammonium.

Results indicate that the greatest losses in both leachate and runoff, regardless of fertilizer source, occurred during establishment. Greater N loss was observed in the plots receiving synthetic organic fertilizers, while greater P loss occurred in the plots with natural organic fertilizers. Once the turf became established, the amount of ammonium and nitrate decreased significantly.

As the grass matured, less water contamination was observed in the fertilized plots due to increased shoot density and infiltration, as well as reduced runoff. The unfertilized control had the lowest shoot density, clipping dry matter production, infiltration rate, and in many cases had equal of higher concentrations of N and P in leachate and runoff.

This study supports previous work that found less risk of water contamination in established turfgrass receiving fertilizer applications. More long-term studies will help quantify the advantages of fertilization against the disadvantages of nutrient losses during establishment.

From: Easton, Z.M. and A.M. Petrovic. 2004. Fertilizer source effect on ground and surface water quality in drainage from turfgrass. J. Environ. Qual. 33:645-655.

Using Manganese to Control Take-All Patch

Take-all patch, caused by the fungus *Gaeumannomyces graminis* var. *avenae*, is a destructive disease of creeping bentgrass. As such, it is a particular concern on the golf course. Infection typically occurs in cool, wet weather, but symptoms are most apparent in warm, dry weather. Maintaining soil pH at about 6.0, as well as balanced nitrogen fertility, can help control the disease. The relationship between fertilization practices and the onset of certain diseases is well documented. Is there such a relationship when it comes to take-all patch?

Researchers at Rutgers University conducted a three-year study to evaluate the suppressive effect of manganese fertilizer applied to fairway turf as a liquid spray. The results showed that manganese fertilization reduced disease severity by about 70 percent. They found that an annual application rate of 2 lbs. of manganese per acre was usually as effective at suppressing the disease as the 8 lb. rate. However, the higher application rates may be required where soil manganese levels are very low. Whether the application was made in the spring or fall did not have a significant effect on the results.

Long-term residual effects were limited. Generally, the beneficial effect of manganese applications lasted for 12 to 18 months. This is because microorganisms eventually convert manganese to forms that are unavailable to plants. Clipping removal further reduces the soil manganese level. Researchers also note that pH adjustment and the use of acidifying nitrogen fertilizers can be used to enhance manganese availability.

For superintendents dealing with take-all patch, including manganese in a fertilizer program can reduce or perhaps even eliminate fungicide applications that are often used to control the disease.

From: Heckman, J.R., B.B. Clarke, and J.A. Murphy. 2003. Optimizing manganese fertilization for the suppression of take-all patch disease on creeping bentgrass. Crop Sci. 43:1395-1398.

Scanning the Journals

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