2006 MTF Proposal (Continuing Project)

Nitrogen and Phosphorus Leaching from a Mature Turfgrass

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Research conducted since 1998 investigated the amount of nitrate leaching from two nitrogen rates, 2 and 5 lbs. N/1000 ft.^{2}/year. NO_3-N concentrations in leachate for the low N rate were typically below 5 ppm. For the high N rate, NO_3-N concentrations in leachate were typically greater than 20 ppm. Our research indicates that total yearly applications of 5 lbs. N/1000 ft.^{2} in the form of urea to a mature Kentucky bluegrass stand may result in high levels of NO_3-N leaching from the soil profile.

This research is an ongoing project that has been funded through 2007 by the USGA at approximately $13,000/year. Over the next two years nitrogen and phosphorus fate will be measured in the lysimeters and the adjacent microplots. The high nitrogen rate was adjusted from 5 lbs. N to 4 lbs. N/1000 ft.^{2}/year in 2004. The low nitrogen rate remains at 2 lbs. N/1000 ft.^{2}/year. Phosphorus from triple superphosphate (20% P) will be applied at two rates, 1 and 2 lbs. P/1000 ft.^{2}/year split over two applications in May and September. Results from 2003 indicated that the high N rate still resulted in very high levels of NO_3-N leaching. Results through mid-year 2005 now indicate that the amount of NO_3-N leaching from the high N rate plots has decreased from approximately 30-40 ppm to approximately 10-20 ppm NO_3-N. This result stresses the importance of investing in long-term research projects.

The ongoing research will identify nitrogen and phosphorus fate in a mature turfgrass system and will provide further data on whether or not fertilizer recommendations for "mature" turfgrass stands need to be altered after a certain period of time to eliminate the potential for excessive nitrate-nitrogen leaching and possible phosphorus leaching.

Deliverables

- Publication of research results in upcoming issue of Crop Science.
- Invitation to speak and write book chapter for the American Chemical Society/RISE Workshop "The Fate of Turfgrass Nutrients and Plant Protection Chemicals in the Urban Environment."

Funding Request

The MTF has supported the Long Term Nitrogen Fate research at MSU for the last five years. For 2006, I request funding at the level of $5000 to match the USGA funds already allocated towards this research project. The funds would be used to support labor costs and sample analysis. I anticipate requesting funds at a similar level for this research through 2007.

MTF Research Funds Requested for 2006: $5,000