

Report for 2003TX93B: Relating Nutrient Imports to Exports and Losses During Sod Production

- Conference Proceedings:
 - Richards, Chad, Clyde Munster, Don Vietor, George Stewart, I. Choi, and Brandon McDonald. 2003. "Calibration of the SWAT Model for Modeling Manure Nutrient Imports in Turfgrass Sod to a Suburban Watershed." Proceedings of the American Society for Agricultural Engineering Conference on Total Maximum Daily Loads, Albuquerque, NM, 2003.
 - Stewart, George, Clyde Munster, Don Vietor, Chad Richards, I. Choi, and Brandon McDonald. 2003. "Calibration of the Geographic Information System-SWAT Model for the Simulation of Phosphorus Export in Turfgrass Sod in the North Bosque River Watershed." Proceedings of the American Society for Agricultural Engineering Conference on Total Maximum Daily Loads, Albuquerque, NM, 2003.
 - Choi, I. Munster, C.L., Vietor D.M., White, R.H., Richards, C.E., Stewart, G.R., McDonald, B. Use of Turfgrass Sod to Transport Manure Phosphorus Out of Impaired Watersheds. In Proceedings of 2003 ASAE TMDL Environmental Regulations II Conference. 518-526. ASAE. St. Joseph, Michigan.

Report Follows

Relating Nutrient Imports to Exports and Losses during Sod Production

Progress Report

Brandon McDonald

Research

I have finished collecting data for my research project titled, "The Fate of Manure Phosphorus During Production and Harvest of Turfgrass Sod". I am currently analyzing this data and preparing it for my Master's Thesis. My project began in the summer of 2002. The project has paired 1.3 ha 'Tifway' bermudagrass sod fields with a 1% slope. Composite soil samples were taken and analyzed prior to establishing the bermudagrass sod. The fields were planted in June 2002. Soil samples were taken to a 90 cm depth in September before composted dairy manure was applied to the north field. Another round of 0-90 cm soil samples were taken in January 2003. In late May and early June, the turfgrass sod was harvested and used commercially. After this harvest, 0-90 cm soil samples were once again taken and another application of composted dairy manure was applied to the north field. In November 2003, the turfgrass was harvested and a final set of 0-90 cm soil samples were taken. All 0-90 cm soil samples were taken on 12 point grid on each field, and divided into 0-5 cm, 5-15 cm, 15-30 cm, 30-60 cm, and 60-90 cm depth increments in order to look more closely at where nitrogen and phosphorus are partitioned in the soil profile.

Throughout the duration of this project, 0-5 cm samples were taken in coordination with significant runoff events in order to correlate P in runoff water and that in the surface layer of the soil. All 0-5 cm soil samples represent a composite sampling taken from each field.

The students in the Biological and Agricultural Engineering Department have worked with collection and analysis of the runoff water. In addition, water infiltration measurements were taken in May, July, and August. A soil water retention study was also conducted in August 2003.

Learning

The learning opportunities from this project have been tremendous. Although I have not finished analyzing the data, I have observed that the composted manure helps to produce high quality turfgrass that re-establishes very quickly after harvest. A preliminary analysis indicates that commercial sod grown on a clay soil with composted manure rates similar to those used in my research will not have problems with excessive P leaching or runoff.

In addition to what I have learned from the research, I have gained valuable experience from being able to grow turfgrass sod in a commercial setting. I gained experience in soil preparation, planting, establishment, fertilization, chemical applications, irrigation, and harvesting procedures. I have also benefited from learning soil analysis techniques, interpretation of complex data, and from working with a diverse research team of faculty and graduate students.

Progress Made in Spending Funds

As of mid February I have approximately \$989.68 remaining from this grant. This will soon be depleted on supplies needed to finish my research.

Progress on My Graduate Program

I am currently working on my last semester of class work needed to complete my Master's Thesis. I plan to graduate in August of this year.