

**PROCEEDINGS OF THE SIXTEENTH ANNUAL  
RUTGERS  
TURFGRASS SYMPOSIUM**

**Bruce B. Clarke, Director  
William A. Meyer, Associate Director**

**January 11-12, 2007  
School of Environmental and Biological Sciences / NJAES**

## **Symposium Organizing Committee**

Bradley Park, Chair  
Bruce B. Clarke  
Barbara Fitzgerald  
Daniel Giménez  
Joseph R. Heckman

## **Proceedings of the Sixteenth Annual Rutgers Turfgrass Symposium**

Joseph Heckman, Mary Provance-Bowley, and Barbara Fitzgerald, Editors

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## Director's Opening Remarks:

Welcome to the sixteenth Annual Rutgers Turfgrass Symposium at the School of Environmental and Biological Sciences/NJAES. The Symposium was established in 1991 to provide Rutgers faculty, students, and staff with an annual forum for the exchange of ideas on a wide range of topics in turfgrass science. The format has been expanded to include presentations by colleagues at other institutions. I would like to thank Dr. Bill Meyer for giving this year's keynote address, as well as Dr. Geunhwa Jung (University of Massachusetts), Dr. Brian Horgan (University of Minnesota) and the Center faculty who have agreed to present their research at this year's meeting. I would also like to recognize the Symposium Planning Committee comprised of Mr. Brad Park (Chair), Dr. Daniel Giménez, and Dr. Joseph Heckman and Ms. Barbara Fitzgerald (co-editors of the Symposium Proceedings) for their hard work in the preparation of this year's program. Without their efforts, this year's Symposium would not have been possible.

The faculty and students in the Turf Center continue to be recognized for excellence in research, teaching, and outreach. In 2006, Dr. Randy Gaugler received the prestigious Albert Einstein Visiting Professorship from the Chinese Academy of Sciences, Dr. Bingru Huang was honored as a Chang Jiang Scholar by the Chinese Ministry of Education, Drs. Jim White and Bruce Clarke were selected as Fellows of the American Association for the Advancement of Science and the Crop Science Society of America, respectively, and Dr. Bill Meyer will receive the Distinguished Service Award from the Golf Course Superintendents Association of America in 2007. Our graduate students also were recognized for significant accomplishments in 2006. At the International ASA-CSSA-SSSA meeting in Indianapolis, Indiana, Ms. Yan Xu placed second in the C-5 Graduate Student Oral Presentation Competition, Mr. Steven McCann received first place recognition in the C-5 Graduate Student Poster Industry Award Competition, and Mr. Jon Bokmeyer received the Tom Salt Award from the Turfgrass Breeders Association for the best oral presentation in the C-5 Division.

Turf Center faculty and staff continue to provide excellent undergraduate, graduate, continuing professional education and service programs in support of students and turfgrass managers throughout the United States. A recent study conducted by the Turf Center revealed that in New Jersey alone, the turfgrass industry has grown significantly over the past 20 years and now contributes 3.2 billion dollars annually to the State's economy. During this time, the turfgrass industry has donated over 4.2 million dollars in grants and gifts to our turfgrass program. This includes more than \$85,000 in privately funded scholarships awarded each year to deserving students in turfgrass science. We are indeed fortunate to have such a close partnership with the Turfgrass Industry and look forward to working with them in the future.

Thank you for coming to this year's symposium. I hope that you will find it an enjoyable and worthwhile experience.

Sincerely,

Bruce B. Clarke, Director  
Center for Turfgrass Science

## **True or False: N Fertilizers Applied to Turf Do Not Impact the Environment**

Brian Horgan

*Department of Horticultural Science, University of Minnesota*

Nitrogen fertilization of turfgrass continues to be scrutinized due to environmental concerns. The majority of research has indicated that turfgrass fertilization with nitrogen poses little risk to the environment. However, Frank et al., (2006) evaluated nitrogen and phosphorus fate and found leaching of  $^{15}\text{N}$ -labeled urea from a 10 year old Kentucky bluegrass turf. On turf receiving  $245 \text{ kg N ha}^{-1}$  annually,  $\text{NO}_3$  leaching exceeded EPA legal drinking water standards 10 years after establishment. In contrast, leachate levels from turf receiving  $98 \text{ kg N ha}^{-1}$  did not exceed levels of 10 ppm  $\text{NO}_3$ . This is the first long-term research project evaluating the environmental impact of turfgrass N fertilization. As Porter et al. (1980) also observed, storage of N in soils is finite. Over time, mineralization of organic N may exceed immobilization on fertilized turf, thus leading to nitrate leaching.

In addition to  $\text{NO}_3$  leaching as an avenue for N loss from the turfgrass system, denitrification of N fertilizers has recently been evaluated. Readily available  $\text{NO}_3$ , wetting and drying cycles from irrigation, and a supply of organic carbon seems to make fertilized turfgrass an ideal system from which nitrogen can denitrify. Results suggest that anaerobic microsites are sufficient for denitrification and complete anaerobicity is not necessary for the production of  $\text{N}_2\text{O}$  and  $\text{N}_2$  (Horgan et al., 2002). In a mass balance of applied fertilizer, as much as 22% N was denitrified.