

1999 TURFGRASS PHYSIOLOGY UPDATE

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Introduction

In 1999, the Baird team conducted more than 30 experiments in the areas of turfgrass physiology, growth regulation and weed management. Below are highlights of the Hancock Turfgrass Research Center (HTRC) activities and our major research projects.

Hancock Turfgrass Research Center

The renovation to the turf center building is, for the most part, completed. Renovation of the Robert W. Hancock Building began in the summer of 1998. The building now contains two meeting rooms, office space for the technical staff, a plant and soil processing room, a graduate student resource room, lunchroom, and an additional bathroom that will better meet the needs of the turfgrass team.

Nine acres of the irrigation system at the HTRC was overhauled in 1999 thanks to the support of Toro, Spartan Distributors, Rainbird, Valley Turf, FloTronix PSI, Century Rain Aid, Nelson Irrigation, and Spears Manufacturing. We would also like to acknowledge Carol Colein & Associates for designing the new system, Spartan Services, Marc Dutton Irrigation, and volunteers from the MTF who assisted with the installation.

The HTRC hosted several special events in 1999 including the North-Central Region meeting of turfgrass researchers and the Turf Producers International summer convention and field days in July. Both of these events were very successful. It would have been impossible to host these events without tremendous planning and effort put forth by Mark Collins and the entire turf center staff.

Shade Physiology and Management

Thanks to the support of the MTF, we have made a long-term commitment to determine better ways to grow turfgrass under reduced light. In 1998, two artificial shade structures were erected on a creeping bentgrass putting green at the HTRC. A preliminary experiment was conducted to determine the influence of nitrogen fertilization and trinexapac-ethyl (Primo) applications on the performance of creeping bentgrass putting greens managed under shaded conditions. In 1999, two additional structures were erected directly adjacent to the existing plots. Data has suggested that repeat applications of the plant growth regulator Primo can help to maintain turfgrass quality in reduced light situations.

Plans for future shade research involve the newly constructed natural shade green at the HTRC. In April 1998, the southeast corner of the HTRC was graded and excavated to make room for a 25,000 ft² natural shade area. Shortly thereafter, twenty maple trees (8-inch caliper) were transplanted onto the site to serve as the boundaries for six research greens. Drainage was installed and twelve inches of sand/peat were brought in to build the root zone. Marc Dutton Irrigation installed the irrigation system in September. Each of the six greens was divided into four plots and planted with A-4, G-2, L-93, and Penncross creeping bentgrass. The research area will be used to study the effects of temporal shade (e.g., morning vs. afternoon shade) and other cultural practices on putting green performance under shade.

Drought and Salinity Tolerance of Transgenic Creeping Bentgrass

Creeping bentgrass has been genetically engineered in Dr. Mariam Sticklen's laboratory by incorporation of the mannitol-1-phosphate-dehydrogenase [mtlD] gene. The mtlD gene has been documented to provide stress tolerance under drought and high salinity conditions in several plant species. The goals of this project are to determine the amount of stress tolerance imparted to creeping bentgrass clones by the mtlD gene and to incorporate these clones into our turfgrass breeding program in order to develop creeping bentgrass cultivars with improved drought and salinity tolerance as well as improved turf quality characteristics.