

1998 TURFGRASS PHYSIOLOGY UPDATE

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Introduction

In 1998, the Baird team conducted more than 30 experiments in the areas of turfgrass physiology and plant growth regulator (PGR) and weed management. Unfortunately, space is limited in the Proceedings to summarize each and every one of these experiments. Below are highlights of the Hancock Turfgrass Research Center (HTRC) activities and our major research projects. For additional information about these or other research projects, please visit our web site at www.msu.edu/user/turf.

Hancock Turfgrass Research Center

The HTRC underwent many changes in 1998. Renovation of the Robert W. Hancock Building began in the summer. Upon completion in April 1999, the building will contain two new conference rooms, a plant and soil processing room, a graduate student resource room, lunchroom, and office space that will better meet the needs of the turfgrass team.

The irrigation system at the HTRC will be completely 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 and Marc Dutton Irrigation and volunteers from the MTF who assisted with the installation.

Other improvements made to the HTRC in 1998 included installation of new cart paths, an equipment wash pad, a cover for the dome, and ornamental grass and perennial display gardens. The turfgrass team is grateful to the Michigan Turfgrass Foundation (MTF) for their continued support of the HTRC.

The HTRC will host 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.

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. Preliminary data suggested that Primo applications 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 G-2, L-93, and Penncross creeping bentgrass, and creeping bluegrass (*Poa annua*). The research area will be used to study the effects of photoperiod (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.