

A Bentgrass Breeding Consortium to Support the Golf Industry

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Objectives:

1. To develop elite clones of creeping bentgrass with multiple pest resistances and stress tolerances that can be delivered to the seed industry for use in synthesizing new creeping bentgrass cultivars broadly adapted to a range of ecological and environmental conditions including reduced pesticide application.

Start Date: 2003

Project Duration: three years

Total Funding: \$170,817
(three institutions)

Crosses have been made between creeping bentgrass and creeping x colonial bentgrass hybrid plants selected during Phase I of this project, creating new progeny populations. Progeny populations will be screened for resistance to dollar spot and snow mold pathogens and will also be evaluated for DNA markers previously associated with resistance to these two diseases. Plants will be selected based on both DNA markers and disease evaluations to test the effectiveness of DNA markers as a selection tool. Selected plants will be crossed with additional elite plants to create additional disease-resistant populations.

This research will build upon previous results of Phase I of this project and will tie into previous results that have mapped putative genes for disease resistance in creeping bentgrass. Elite clones of creeping bentgrass and creeping x colonial hybrids will be released to private breeders



Selection of the most disease resistant clones at the O.J. Noer Turfgrass Research and Education Center, Verona, WI.

for use in developing new varieties for the golf industry.

Activities for 2008 focused on the establishment of replicated clonal evaluation plots of progeny from elite crosses, extraction of DNA from leaves, and the initial assay of DNA markers. Replicated field evaluations were established in

Massachusetts, New Jersey, and Maryland in 2007 and 2008.

In 2009, data will be collected on disease resistances of field-grown plants and DNA markers. Selected plants will be used to create new hybrid plants, progeny populations, and releases of individual clones or genotypes to bentgrass breeders who are developing new varieties.



Creeping bentgrass clones originating from Illinois, Michigan, or Wisconsin tended to have better resistance ratings to both dollar spot and snow mold when evaluated in their state of origin compared to clones from outside that state. Four creeping bentgrass clones demonstrating various levels of resistance to the dollar spot fungus, *Sclerotinia homeocarpa*, at Gateway Golf Club, Land 'O Lakes, WI., are shown above.

Summary Points

- Creeping bentgrass plants with improved resistance to both dollar spot and snow mold fungi have been identified and propagated.
- These plants will be released to private turf breeders for use in developing new and more disease-resistant creeping bentgrass varieties.
- This research has contributed to the identification of specific genes for resistance to snow mold and dollar spot diseases, which can be used to design more efficient and effective breeding methods based using DNA marker technologies. These methods will be tested in the current phase of this project.