

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)

Field evaluations of dollar spot and snow mold diseases were completed in spring 2006 with the collection of grey snow mold data from East Lansing, MI and speckled snow mold data from Land 'O Lakes, WI. We completed our dollar spot assessment of these clones in 2005, collecting data from East Lansing, MI, Land 'O Lakes, WI, and Urbana, IL.

Field observations for both dollar spot and snow mold were highly repeatable within locations, but showed low repeatability between locations. Clones originating from Illinois, Michigan, or Wisconsin tended to have better resistance ratings when evaluated in their state of origin, compared to clones from outside that state. This was observed for both dollar spot and snow mold. This may indicate some potential for race and species specificity for both of these diseases. This result underscores the importance of using multiple locations and growing seasons to evaluate these important diseases of creeping bentgrass.



*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.*

Based on all of our combined snow mold and dollar spot results, a total of 20 superior clones were selected for release to private creeping bentgrass breeders. These clones will be vegetatively multiplied in the greenhouse and transported to Oregon in spring 2007 for release to the breeders, who will be responsible for reporting the use of these clones as parents of any new varieties to be produced from their programs.

The consortium has contributed to the discovery of genes that control both dollar spot and snow mold diseases in creeping bentgrass. One gene for resistance to dollar spot and another gene for resistance to snow mold have been discovered to be highly consistent across locations and years. Numerous other genes appear to be important in controlling resistance to these genes, but most of these other genes show some inconsistency across locations, years, or disease organisms.

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.



A creeping bentgrass clone selected for resistance to dollar spot and snow mold showing high turf density and fine texture.