

IDENTIFICATION AND MANAGEMENT OF MOSS AND  
PHYTOPATHOGENIC ALGAE COMMON ON CREEPING  
BENTGRASS PUTTING GREENS

A Thesis Presented for the  
Masters of Science Degree  
The University of Tennessee, Knoxville

Steven Michael Borst  
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## THESIS ABSTRACT

Taxonomic traits were utilized to identify problematic moss species common to golf course putting greens. Three predominant species of moss were identified on two golf course putting greens located in East Tennessee. *Bryum argenteum*, *Amblystegium serpens* and *Entodon seductrix* were identified on creeping bentgrass putting greens. Green house studies were initiated to investigate all three moss species control with carfentrazone and mancozeb. Utilizing digital image analysis investigations concluded carfentrazone controlled all three moss species greater than mancozeb. Sequential carfentrazone applications controlled all three moss species greater than single applications. Moss recovery and regrowth was observed with carfentrazone.

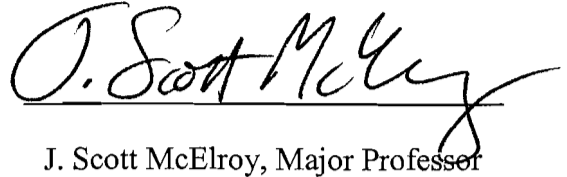
Field studies were initiated to evaluate *Bryum argenteum* control utilizing mancozeb, carfentrazone, and cultural practices. Cultural practices improved carfentrazone long term efficacy. Carfentrazone controlled *Bryum argenteum* greater than mancozeb. Similar *Bryum argenteum* control was observed with cultural practices alone and carfentrazone alone. *Bryum argenteum* recovery was observed with carfentrazone alone treatments. Mancozeb and non-treated plots increased in *Bryum argenteum* populations.

A common problematic species of cyanobacteria was identified on three golf courses all located near Knoxville, TN. Isolates were identified genetically and compared to other similar isolates. The Tennessee cyanobacteria isolate had a 94 % match to a *Phormidium murryi*, a filamentous mat forming cyanobacteria. The isolate

was then subjected to a ten day *In vitro* screen determining copper and zinc toxicity levels. Both copper and zinc killed the Tennessee cyanobacteria isolates at 3.2 $\mu$ M concentrations. Both zinc and copper at 0.6  $\mu$ M concentrations increased the Tennessee cyanobacteria isolates growth when compared to the non-treated.

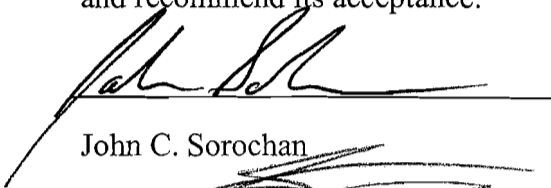
To the Graduate Council:

I am submitting herewith a thesis written by Steven Michael Borst entitled "Identification and Management of Moss and Phytopathogenic Algae Common on Creeping Bentgrass Putting Greens." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Plant Science.




J. Scott McElroy, Major Professor

We have read this thesis  
and recommend its acceptance:

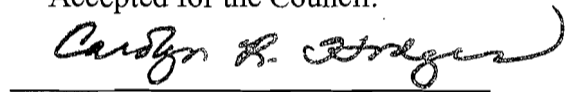


John C. Sorochan



Steven W. Wilhelm

Accepted for the Council:



Carolyn R. Hodges, Vice Provost  
and Dean of the Graduate School

(Original signatures are on file with official student records)