



Rapid Evaluation of Buffalograss Germplasm for Leaf Spot Resistance

K.L. Amundsen and B.S. Amaradasa, University of Nebraska, Lincoln, NE



ABSTRACT:

Buffalograss [*Buchloë dactyloides* (Nutt.) Engelm.] is a North American native turfgrass species, ideally suited for low input sustainable turf applications. The fungal pathogen *Curvularia lunata* causes leaf spot disease of buffalograss. Resistance to leaf spot would improve buffalograss performance and reduce fungicide applications further contributing to the reduced input requirements of buffalograss management. A preliminary screen of 87 distinct buffalograss genotypes, including seven named varieties and 80 experimental lines, was conducted in the greenhouse. The study was designed as a randomized complete block design with three replications. On March 20th, 2012, each genotype was inoculated by spraying with 15 ml of a *C. lunata* spore solution. The spore solution contained 3.9×10^5 conidiospores/ml. Each inoculated genotype was placed inside a clear plastic bag and sprayed every other day with water prior to the final rating date to promote environmental conditions conducive to disease development. Occurrence of disease was visually estimated on a zero (no disease) to ten (100% diseased) scale on March 30th and April 3rd, 2012. Ratings ranged from one to nine, with an average rating of 3.95 across all samples and rating dates. Cultivar Prestige performed the worst with a mean rating of 6.33 and the experimental line NE-BFG-11-3625 performed the best with a mean rating of 1.33. Some individuals also exhibited delayed onset of disease. This data was used for selecting 14 leaf spot resistant buffalograss genotypes that will be tested for resistance in a field study. The combined data will allow us to determine the efficacy of greenhouse screening for leaf spot resistance in buffalograss.

OBJECTIVE:

Identify buffalograss germplasm with resistance to leaf spot disease

EXPERIMENTAL DESIGN:

Eighty seven buffalograss genotypes were grown in the greenhouse in 3" square pots. The varieties consisted of seven named varieties and 80 experimental lines from the University of Nebraska breeding program. The pots were organized in a randomized complete block design with three replications.

INNOCULATION METHOD:

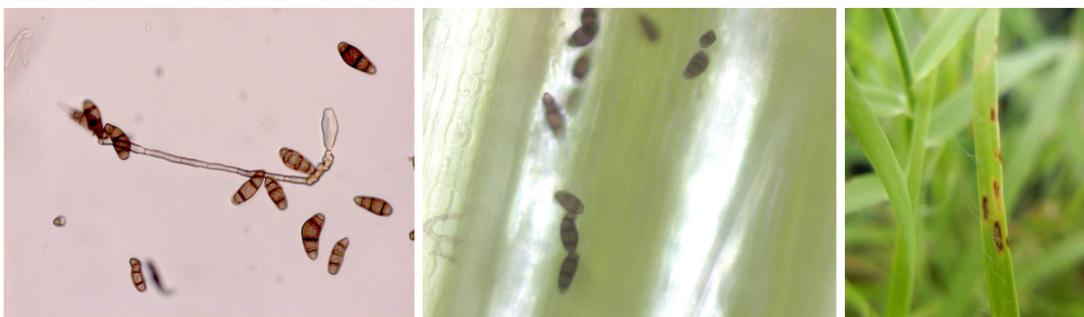
1. Leaf spot pathogen was grown on PDA for 2 wks
2. The cultured pathogen was then blended with water and filtered to remove larger aggregates
3. Spore solution contained 3.9×10^5 conidiospores/ml
4. 15ml of the spore solution was sprayed onto the turf
5. Each pot was enclosed in a clear plastic bag
6. Plants were misted with water periodically to maintain moisture and promote disease development



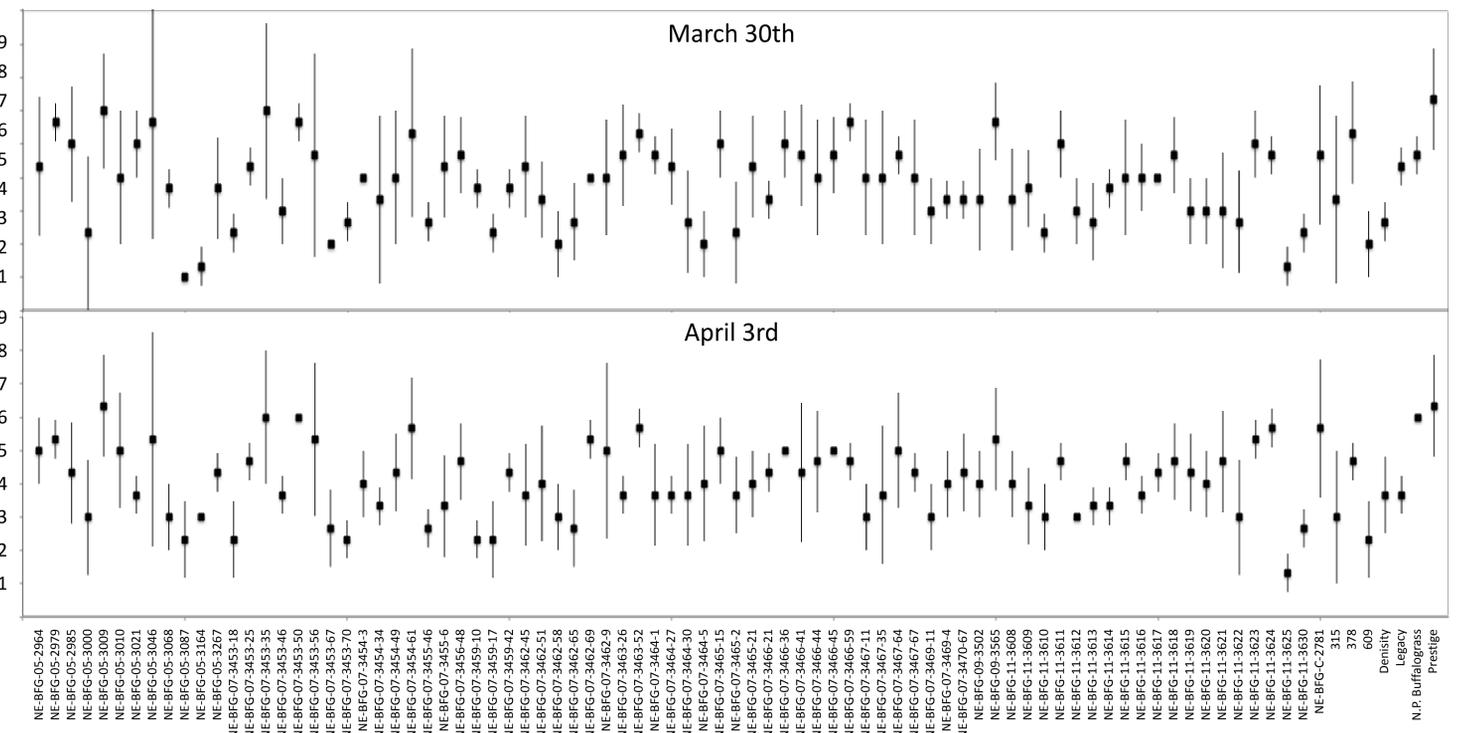
Pots enclosed in clear plastic bags following inoculation.

DISEASE RATINGS:

Disease was evaluated within two weeks after inoculation
Disease was rated on a scale from zero (no disease) to 10 (total plant death)



A conidiophore and conidiospores of an isolate of *C. lunata* cultured in the lab (Left). Conidiospores on leaf tissue following inoculation (Center). Disease symptoms on a buffalograss leaf following inoculation (Right).



Average disease rating for each variety collected 10 (March 30th; $LSD_{0.05}=2.2$) or 14 (April 3rd; $LSD_{0.05}=1.9$) days after inoculation.



Susceptible
Prestige



Resistant
NE-BFG-7-3453-18

- Prestige, 378 and an additional 23 experimental lines were most susceptible to the disease at both rating dates.
- The experimental line NE-BFG-11-3621 performed among the best on March 30th, but among the worst on April 3rd, suggesting this variety exhibits delayed onset of disease symptoms
- 609, 95-55 and an additional 15 experimental lines were the most resistant to the disease at both rating dates.

SUMMARY:

This method allowed for rapid screening for host resistance to leaf spot disease of a large number of buffalograss selections. Fifteen experimental lines out of 80 were identified with some level of resistance to leaf spot disease.

NEXT STEPS:

Fourteen top performing individuals from the greenhouse screen along with Prestige as the susceptible control were established in the field during the summer of 2012 in a strip plot design with three replications. Buffalograss will be inoculated with *Curvularia lunata* and incidence of disease monitored.



ACKNOWLEDGEMENTS:

This research was supported by the United States Golf Association and the Nebraska Turfgrass Association

