*Evaluating Poverty Grass (*Danthonia spicata *L.) for Use in Tees, Fairways, or Rough Areas in Golf Courses in the Midwest*

Nadia E. Navarrete-Tindall, Brad Fresenburg, and J.W. Van Sambeek
University of Missouri

Objectives:

1. Identify best practices to optimize seed germination, seed production, and field seeding rates.
2. Determine tolerance to shade and herbicides.

Start Date: 2007
Project Duration: two years
Total Funding: $20,000

Poverty grass (*Danthonia spicata* L.), a native-cool season perennial grass with wide distribution in the United States, is being evaluated for its suitability for use on golf courses. Potential benefits of using poverty grass include reduced dependency on fertilizers and irrigation and less frequent mowing. The goal is to identify practices to improve seed germination and successfully establish field plots as monocultures or with other native species.

This grass is found in most prairies, savannas, and open woods throughout Missouri. However, seed commercially available is very limited. Seed has been collected every year since 2005 from different locales in Missouri in cooperation with seed producer Mervin Wallace of Missouri Wildflowers nursery. This seed is being used for trials and is also available for private seed producers in Missouri.

Seed averages 400,000 PLS/pound and is highly dormant. Untreated seed collected in Missouri in 2006 was 89% dormant with less than 5% germination under 25°C. Seed collected in 2008 was also mostly dormant.

Different combinations of stratification (moist storage), scarification (mechanical disruption of seed coat), light, and temperature were evaluated to break seed dormancy and improve germination. Light improved germination of scarified seed (63 % vs. 46% in dark) and non-scarified seed (30 % vs. 4 % in dark). Germination after 40 days at 25°C for scarified seed exposed to cold, moist stratification (5°C) for 10, 20, 30, and 40 days averaged 64, 66, 62, and 59%, respectively, in contrast to 35, 36, 53, and 59%, respectively, for non-scarified seed. The best seed treatment combinations will be evaluated on existing seed collections to determine if dormancy varies among seed sources and length of storage.

Plots established with scarified seed at three seeding rates (1000, 2000, and 3000 PLS/sq ft) in fall 2007 had 24, 25, and 30% poverty grass ground cover respectively in May 2008.

Seedlings were started in June 2006 from scarified seed sown in trays filled with a commercial soil mix or a silt loam soil for seed production plots. Seedlings from Minnesota, but not Missouri seed sources, were infected with *Dreschslera* leaf spot. Seedlings established 3-4 inches apart on Mexico silt loam soil at the University of Missouri-Bradford Research and Extension Center in June 2007 produced an average of 146 lb/acre of seed collected manually in June 2008. Plots established with scarified seed at three seeding rates (1000, 2000, and 3000 PLS/sq. ft.) in fall 2007 had 24, 25, and 30% poverty grass ground cover respectively in May 2008. Bare ground was 60% average for all rates.

Because these plots were infected with white clover and a few other broadleaves (5-15% cover), 2,4 D and Remedy herbicides were sprayed at a rate of 0.5 or 1 pint/acre. Remedy reduced clover and 2,4 D did not have much effect. Poverty grass did not seem to be affected by either herbicide. Additional weed control was done by hand. Ground cover will again be evaluated in 2009.

Four shade levels (0, 30, 45, and 80%) are being evaluated on the growth rate and seed production of poverty grass using structures covered with shade cloth.

Shade tolerance studies were initiated in summer 2008 in pots filled with a soil mix at Bradford Farm and will be replicated at Carver Farm at Lincoln University in 2009. Four shade levels (0, 30, 45, and 80%) are being evaluated on the growth rate and seed production of poverty grass using structures covered with shade cloth.

Summary Points

- Natural prairies or savannas in Missouri are a good source of seed of poverty grass.
- Mechanical scarification and light increased seed germination of poverty grass.
- Poverty grass grown with complete weed control produced 146 lb. seed per acre. However, more work is needed to reduce weed competition.
- Broadleaf herbicides 2,4-D and Remedy do not seem to affect poverty grass growth when applied during the growing season in May-June.