

Genetic Improvement of Prairie Junegrass

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Objectives:

1. Determine the genetic potential of native prairie junegrass (*Koeleria macrantha*) germplasm for use as low-input turfgrass.

Start Date: 2007

Project Duration: three years

Total Funding: \$30,000

Grass species that are native to North America should be better able to cope with our environment and could lead to overall reductions in inputs such as fertilizers, pesticides, and water. Prairie junegrass, *Koeleria macrantha*, which is native to the Great Plains of the United States, has shown the potential to be successfully used as a turfgrass in lower-input environments.

The species is widely distributed throughout much of the western United States, and it can also be found throughout much of Europe and Asia. Based on data that has been collected in recent years, this species appears to perform well in Minnesota under low-input conditions (no irrigation, limited nitrogen application, and no fungicide or insecticide applications).

Prairie junegrass has several attributes that would make it a useful low-input turfgrass in Minnesota including tolerance of droughty and alkaline soils, tolerance of sandy areas, survival of low and high temperature extremes, and reduced growth rate. 'Barkoel' was the first cultivar of this species specifically developed for use as a turfgrass; however, this cultivar was developed with ecotypes from Europe. We are proposing the develop-



The material for this prairie junegrass breeding nursery was originally collected in western North Dakota.

ment of a cultivar using germplasm native to North America.

Developing a high quality turfgrass is not, by itself, adequate. In order to be used by consumers, an economically viable turfgrass cultivar must be able to produce sufficient quantities of seed. Non-selected populations of the species can produce seed for 4-5 years. Collections of natural ecotypes made in 2005 suggest that individual genotypes may possess the ability to be highly productive; however, it is unknown if it can produce economically adequate amounts of seed.

In order for a cultivar of this species to be used on a wide scale, two cri-

teria must be met: 1) the cultivar must possess adequate turfgrass quality in a medium to low maintenance management situation, and 2) the cultivar must possess adequate seed production traits so that a sufficient supply of seed can be produced at a reasonable cost.

We have collected native prairie junegrass germplasm from Minnesota, South Dakota, North Dakota, Colorado, and Nebraska. These germplasm collections have been established in breeding nurseries, and in some cases, experienced one cycle of selection.

We have established several spaced-plant evaluations that will be used to determine the genetic variation present in our populations for various turfgrass and seed production characteristics. We have also established turf plots of selected collections; these plots will be evaluated for the first time in 2008.

Summary Points

- The native grass *Koeleria macrantha* has characteristics that could make it useful as a low-input turfgrass.
- Collections of native germplasm have been made throughout the Great Plains and upper Midwest.
- Germplasm collections are currently being evaluated for turfgrass quality characteristics and seed production potential.



Collecting prairie junegrass in southeastern Minnesota