ANNOUNCING THE RELEASE OF

ITASCA GERMPLASM LITTLE BLUESTEM

SELECTED CLASS OF NATURAL GERMPLASM

by the
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

and the
MINNESOTA
AGRICULTURAL EXPERIMENT STATION

and the
NORTH DAKOTA
AGRICULTURAL EXPERIMENT STATION

and the
SOUTH DAKOTA
AGRICULTURAL EXPERIMENT STATION

The United States Department of Agriculture, Natural Resources Conservation Service; the Minnesota Agricultural Experiment Station; the North Dakota Agricultural Experiment Station; and the South Dakota Agricultural Experiment Station announce the naming and release of a selected class of little bluestem, *Schizachyrium scoparium* (Michx.) Nash.

As a selected class release, this plant will be referred to as **Itasca Germplasm little bluestem.** It has been assigned the NRCS Accession Number 9063125. This accession is a composite of two populations: ND-4114 (9036130) and ND-4117 (9047148). Itasca Germplasm little bluestem has been developed to provide an adapted seed source with a broad genetic base for use in the Upper Midwest, particularly Minnesota, eastern/central North Dakota, and eastern/central South Dakota. Its primary use is as a component in native seeding mixtures.

The name "Itasca" was chosen to identify with the Minnesota Region and original collections which comprise two of the composite sources of this selection. Itasca State Park *is* located in Clearwater County and Becker County, Minnesota.

This alternative release procedure is justified because there are no releases of little bluestem originating from this region, and native harvest is unreliable (Tober and Chamrad 1992). This is the only known source of alternative release/varietal material of little bluestem comprised of Minnesota collections. Badlands ecotype is similar in habit and performance, but consists of more central and western North Dakota and South Dakota plant saurces.

Collection Site Information: Itasca Germplasm little bluestem is a composite of 72 accessions (Table 1) selected from an initial evaluation nursery of 588 accessions. All accessions were vegetatively collected in September of 1979 from native grasslands in North Dakota, South Dakota, and Minnesota (Tober et al. 1981). Selected plants comprising the Itasca Germplasm originated from eastern North Dakota, north central South Dakota, and central and northeastern Minnesota. The

intent of the field selection was to obtain a broad genetic base of native plant material from diverse sites within representative Major Land Resource Areas (USDA 1981). Two to four sites per county were sampled, and six vegetative subsamples were collected at each site. A description of the collection area was documented for each accession.

The collection area of the 72 selected accessions includes three Major Land Resource Regions: the Northern Great Plains Spring Wheat Region, the Northern Lake States Forest and Forage Region, and one selection from the Central Feed Grains and Livestock Region. The selected accessions originated from the following major Land Resource Areas within these regions: 53, 538, 55, 558, 56, 57, 90, 91, 94, 102.

The Northern Great Plains Spring Wheat Region has fertile soils favorable for agriculture, but low precipitation and a short growing season severely limit the crops that can be grown. Annual precipitation ranges from 10 to 22 inches and the freeze-free period is 100 to 155 days. The Northern Lake States Forest and Forage Region has soils poorly suited to cultivation and a short, cool growing season which severely limits agriculture in the region. Average annual precipitation ranges from 20 to 33 inches and the freeze-free period ranges from 95 to 145 days.

Description: Little bluestem is an erect, medium-tall, perennial, warm-season bunchgrass with a deep fibrous root system. Basal portions of stems and leaf sheaths are somewhat flattened and leaves are slightly folded. Leaves become reddish-brown at maturity, and mature seeds are fluffy white. Little bluestem reproduces from tillers, short rhizomes, and seed. Itasca Germplasm little bluestem does not differ significantly from a general plant description of the species; however, plants may be somewhat leafier and have improved seed production and increased overall plant vigor when compared to local sources of the region. Variation in plant size, leaf width, and color are considered normal within the population. Itasca Germplasm little bluestem varies in mature height depending on the site and plant density. A field in northwest Minnesota averaged 41 inches in height in 1997. Plant height averaged 32 inches at Bismarck, North Dakota, in 1997. Little bluestem, as with most warm-season species, may exhibit increased vigor and plant size when moved north of its area of origin.

Method of Selection: Clonal material of each accession was propagated and transplanted in 1980 to a spaced-plant initial evaluation nursery with a 12-replicate randomized complete block design. The released cultivars Blaze, Camper, Cimarron, and Aldous were included as standard checks. The initial evaluation nursery contained more than 7,000 individual plants and was located at the USDA, Agricultural Research Service, Northern Great Plains Research Laboratory, Mandan, North Dakota. Plant characteristics evaluated from 1980-84 included vigor, leafiness, phenology, lodging, plant size, and disease resistance. Phenotypic variation in plant size, color leaf width, and phenology were evident across the planting (Tober et al. 1984). Leaf spot disease caused primarily by *Phyllosticta andropogonivora* was identified and found to be widespread in the nursery from 1984-87 (Krupinsky and Tober 1990). Selection was practiced among accessions for resistance to leaf spot disease. The nutritive quality of selected little bluestem clones was documented (Karn and Tober 1990).

Superior plants rated above the nursery average were selected from these evaluations. Due to broad variation and maturity differences, the selected plants were sorted into four populations associated with Major Land Resource Areas. Clonal material of each of the four populations was propagated and transplanted to individual isolated crossing blocks.

Clonal material from the 72 accessions that comprise the genetic base of Itasca Germplasm little bluestem was from two of the four selected populations. ND-4114 (9036130) was a block of plants originating from eastern North Dakota and north central South Dakota. ND-4117 (9047148) plants originated from central and northeastern Minnesota. Both isolation blocks were planted at the Apple Valley evaluation site in 1986. Clonal material was transplanted in crossing blocks in a 5-replicate

randomized complete block design. Seed was harvested until 1991 when the blocks were removed. The differences exhibited between these two populations were not enough to continue separate breeding strategies. Seed previously collected from each of these breeder blocks was composited and assigned the Accession Number 9063125, which is now designated Itasca Germplasm little bluestem. The goal in plant selection was to representatively composite a diverse group of vigorous little bluestem genotypes adapted to the Upper Midwest Region. Genetic variation is desirable and contributes to species longevity and adaptation to different soils and climatic extremes over time.

Ecological Considerations and Plant Performance: Itasca Germplasm little bluestem is a selection of naturally occurring germplasm collected within the primary recommended area of use and has undergone minimal purposeful selection. This accession was determined to be "OK to Release" by the standards set forth in the NRCS worksheet "Environmental Evaluation of Plant Materials Releases."

This selection has been compared to Blaze, Camper, Aldous, Cimarron, and Badlands ecotype in initial evaluation trials at the Bismarck Plant Materials Center since 1989. Itasca Germplasm and Badlands ecotype were the only entries to produce viable seed every year. Blaze and Camper (originating from Nebraska and Kansas) were approximately four weeks later in maturity and generally did not produce viable seed by the end of the growing season. Aldous and Cimarron (originating from Kansas) remained vegetative throughout the growing season and had severe winter injury. Vigor and foliage abundance ratings were comparable for Itasca Germplasm, Badlands ecotype, Blaze, and Camper. Vigor and foliage abundance ratings were considerably lower for Aldous and Cimarron because of winter injury.

Itasca Germplasm averages about six inches shorter than Badlands ecotype in comparisons at Bismarck, North Dakota. Visual observations also indicate slightly less basal area for Itasca Germplasm compared to Badlands ecotype.

Anticipated Conservation Use: The primary conservation use of Itasca Germplasm little bluestem is as a northern source component species for various native seedings. Secondary uses would include reduced maintenance plantings, wildlife plantings, and prairie landscaping.

Potential Area of Adaptation: This selection is expected to perform well on those soils/sites suitable for the species in regions of the Upper Midwest and Northern Great Plains including Minnesota, Wisconsin, North Dakota, South Dakota, eastern Montana, northeast Wyoming.

Availability of Plant Materials: Generation 2 (G2) seed will be made available for commercial seed increase by the Bismarck Plant Materials Center. Seed will be distributed through the North Dakota State University Foundation Seedstocks Program as a selected class (green tag) of natural germplasm. Certification is limited to three generations.

References:

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D.A. Tober, E.T. Jacobson, and R.J. Haas. 1981. Vegetative assembly and evaluation of little bluestem for conservation use in the Northern Great Plains. P. 10. *In:* Abstracts SRM 34th Ann. Mtg., Tulsa, OK, Feb 9-13.

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USDA Soil Conservation Service. 1981. Land Resource Regions and Major Land Resource Areas of the United States. Agr. Handb. 296. U.S. Gov. Print. Office, Washington, D.C.

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