The
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
and
MINNESOTA
AGRICULTURAL EXPERIMENT STATION
and
NORTH DAKOTA
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and
SOUTH DAKOTA
AGRICULTURAL EXPERIMENT STATION

ANNOUNCE THE RELEASE OF SELECTED CLASS

RED RIVER "NATURAL" GERMPLASM PRAIRIE CORDGRASS

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS, formerly the Soil 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 selected class Red River natural germplasm prairie cordgrass, *Spartina pectinata* Link.

This prairie cordgrass selection has been assigned NRCS accession number 9069159 and given a Plant Introduction (PI) number of 599561. Red River germplasm prairie cordgrass has been developed to provide an adapted seed source with a relatively broad genetic base for use in the North Central and Northern Plains Region of the United States. Primary use is for wetland restoration and enhancement and streambank stabilization. Secondary uses include windstrip barriers, filter strips, riparian buffers, and prairie landscaping.

ORIGIN/SELECTION: Red River germplasm prairie cordgrass is a composite of 4 accessions (Table 1) selected from an evaluation nursery of 20 accessions. All accessions were vegetatively collected by USDA Soil Conservation Service personnel in September and October, 1990. Plants were collected from North Dakota, South Dakota, and Minnesota (USDA 1992-1993). A description of the collection site was documented from each accession. Clonal material of each accession was propagated and transplanted to a spaced-plant evaluation nursery containing three replicates of three plant clones in a randomized complete block design.

The initial evaluation nursery contained 180 individual plants representing 20 different accessions. A small wetland was constructed on a low area in a seed production field at the Bismarck Plant Materials Center. Water from an irrigation system was used to flood the area on a regular basis. Data collection in 1992 and 1993 included vigor, rate of spread, plant height, foliage abundance, seed production, and phenology. A seedling emergence study was also conducted in 1992 to compare germination and seedling vigor qualities among accessions (USDA 1992-1993).

Phenotypic variation among accessions was evident. Significant variation was noted in plant height, leaf width, stem coarseness, leaf abundance, and phenology. Four accessions were selected to represent the Red River germplasm. Two of the accessions originated from the Red River Valley bordering North Dakota and Minnesota.

Selected accessions rated comparable to the nursery mean for vigor and width of spread (Table 2). Overall, plant height was greater than the nursery mean for three of the four accessions. Phenology varied slightly for the four selected accessions but was generally within a range of 5 to 7 days. This was about a week earlier than the nursery mean. Three of the four accessions were rated high for seed production. Visual observations indicated all four accessions were generally more leafy compared to the nursery average. Distinctive differences were noted throughout the nursery for coarseness of leaf and stem material. Two of the accessions were relatively fine-leaved, and one had coarser leaves.

Three of the selected accessions were collected from fairly typical wetland sites with similar associated species. Accession 9063068 was the exception. It was collected from a saline area growing in association with more salt tolerant species (Table 1).

Clonal material was propagated from the four selected accessions and transplanted to an isolated seed production field in 1994. The field is approximately 2 acres with 15 rows spaced 10 feet apart. Seed harvested from this field will be considered Generation 1 parent seed.

PLANT DESCRIPTION: Prairie cordgrass is one of the tallest grasses native to North America. It varies in height from 4 to 10 feet and occupies wet soils throughout the prairie region of North America. Prairie cordgrass is a warm-season species with long, coarse leaves, thick stems, and scaly rhizomes. Leaf blades may be up to 30 inches long with sharp points on the margin (Johnson and Nichols 1982). The inflorescence is a spike. The number of spikes can vary from 10 to 30. Red River germplasm prairie cordgrass does not differ significantly from the general plant description of the species; however, plants may be somewhat leafier and have improved seed production when compared to the typical Northern Plains ecotype. Moderate variation in plant size and coarseness of leaf is to be expected in the Red River germplasm.

Red River germplasm prairie cordgrass varies in height from 5 to 7 feet. Plant color is a uniform dark green with yellowing of the leaves beginning in late summer. Phenology is fairly uniform and may vary from 5 to 10 days. Average first anthesis at Bismarck, North Dakota, is mid to late July.

SITE DESCRIPTION: The collection area of the 4 selected accessions includes parts of two Major Land Resource Regions: the Northern Great Plains Spring Wheat Region and the Central Feed Grains and Livestock Region (USDA 1981). Within these two regions, selected plants originated from the following Major Land Resource Areas: 56 (Red River Valley of the North) and 102A (Rolling Till Prairie).

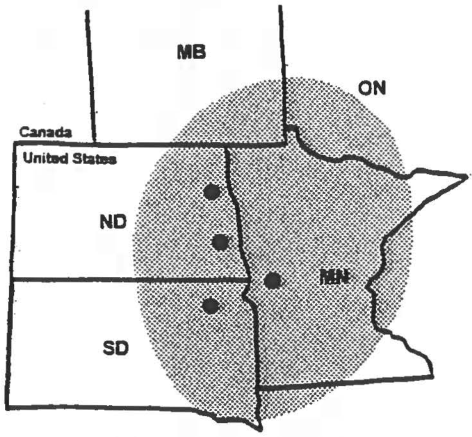
The climate of the area is temperate with temperature extremes being the normal. Winter temperatures of -40^0 F may occur in the northern part of this region. Killing frosts often occur in late May. The average annual temperature varies from about 40 to 52^0 F. More than one-half of the average annual precipitation falls during the growing season. Precipitation in winter is snow. The freeze-free period of this area varies from 105 to 140 days. Elevation is relatively flat in the Red River Valley area and grades into more rolling terrain outside of the valley.

Associated wet meadow species include whitetop *(Scolochloa festucacea)*, slough sedge *(Carex atherodes)*, northern reedgrass *(Calamagrostis stricta)*, maximilian sunflower *(Helianthus maximiliana)*, big bluestem *(Andropogon gerardii)*, and switchgrass *(Panicum virgatum)*.

PLANT PERFORMANCE: There are no commercial varieties of prairie cordgrass; therefore, the nursery mean was used as a standard of comparison. Compared to more northern germplasm, Red River germplasm prairie cordgrass can be expected to perform comparably in plant vigor and establishment. Seed production and leafiness were rated higher for the selected accessions compared to the nursery mean. Phenology was rated about a week earlier than the nursery mean.

Seed production fields at the Bismarck Plant Materials Center have been established from rhizome material harvested from the parent plants. Rhizome material with about a 12" stem intact was planted using a tree planter. Vigor and establishment was good to excellent. One field was harvested for a small amount of seed the year of planting. A production field in Minnesota was established from seed with good emergence and seedling vigor (Kaste 1996).

The 4 collection sites of Red River germplasm prairie cordgrass are indicated on the following map. The projected primary area of adaptation is shaded.



SEED PRODUCTION CONSIDERATIONS: Experience at the Bismarck Plant Materials Center has shown that wide row spacing is beneficial for seed production of prairie cordgrass. A row spacing of 10 feet has worked well, with regular cultivation between the rows. A 2-acre field has yielded about 150-200 pounds of clean seed per year.

Seed is harvested by straight combining in early October, after the leaf material has dried down as much as possible. Seed shattering has not been a problem. Flooding is generally not required, but irrigation is desirable for maximum production.

Prairie cordgrass can be harvested with a standard combine with a straight header. Higher cylinder RPM's (1200) are necessary for threshing the seed. Fan speeds should be reduced to avoid blowing the seed over the sieves. Prairie cordgrass leaves and stems are very fibrous, and combining should be done during dry conditions.

RELEASE JUSTIFICATION: There are no commercial varieties available for prairie cordgrass. Common seed of northern origin prairie cordgrass has been in limited supply. Red River germplasm prairie cordgrass has been developed to meet the increased need for a northern origin prairie cordgrass to be planted as a wet meadow species for wetland restoration and enhancement and streambank stabilization.

AVAILABILITY OF PLANT MATERIALS: Generation 1, or parent seed, of Red River germplasm prairie cordgrass is available from the USDA-NRCS Plant Materials Center, 3308 University Drive, Bismarck, North Dakota 58504-7564. Limited quantities of Generation 2 seed will be available from commercial vendors beginning in the fall of 1997. Certification is limited to two generations.

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Table 1. Selected plants comprising Red River germplasm prairie cordgrass.

Accession Number	County/State Collected	Major Land Resource Area	Average Annual Precip. (inches)	Site Information	Associated Plant Species	Legal Description	Collector
9063065	Cass Co., ND	56	19.45	wet road ditch	*Andropogon gerardii*, *Typha* sp.	sec 35, T. 143 N., R. 52 W.	Russ Haas
9063068	Grand Forks Co., ND	56	18.34	saline area	*Kochia scoparius*, *Hordeum jubatum*	sec. 6, T. 151 N. R. 51 W.	Russ Haas
9063072	Grant Co., MN	102A	21.66	wet area	*Andropogon gerardii*, *Helianthus maximiliana*, *Solidago* sp.	sec. 17, T. 128 N., R. 44 W.	Russ Haas
9063082	Day Co., SD	102A	19.38	upper edge of wetland	N/A	sec. 23, T. 121 N., R. 56 W.	Mark Washechek

Table 2. Data collected in 1992 and 1993 from initial evaluation nursery with three replications and twenty accessions.

Accession	Year	Origin	Vigor [1]	Width of Spread (inches)	Phenology [2]	Height (inches)	Comments
9063065	1992	Cass Co., ND	4.0	----	4.0	----	N/A
9063065	1993	Cass Co., ND	----	41	5.0	76	Excellent seed production, fine leaf, very leafy
9063068	1992	Grand Forks Co, ND	5.3	----	4.0	----	N/A
9063068	1993	Grand Forks Co, ND	----	39	5.0	66	Excellent seed production, very leafy
9063072	1992	Grant Co., MN	4.7	----	3.0	----	N/A
9063072	1993	Grant Co., MN	----	37	4.2	78	Good seed production, very leafy
9063082	1992	Day Co., SD	3.5	----	3.5	----	N/A
9063082	1993	Day Co., SD	----	39	3.5	76	Very leafy, coarser leaf
Nursery Range	1992/93	ND-SD-MN	2.3-6.7	20-51	2.0-5.0	54-82	N/A
Nursery Mean	1992/93	ND-SD-MN	4.5	40	3.1	71	N/A

[1] 2=Highest; 6=Lowest

[2] 1=Vegetative; 2=Jointing; 3=First emergence of inflorescence, 10 culms or more; 4=First anthesis, 10 culms or more; 5=50 percent anthesis; 6=First seed ripe; 7=50 percent of seed ripe; 8=Seed mature; 9=Complete dormancy. 1992 phenology collected on July 17, and 1993 phenology collected on July 30.

APPROVALS:

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