

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

ANNOUNCE THE RELEASE OF SELECTED "NATURAL" GERMPLASM OF  
**BISMARCK ECOTYPE BUFFALOGRASS**

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service), and the North Dakota Agricultural Experiment Station announce the naming and release of the selected natural germplasm of Bismarck ecotype buffalograss, *Buchloe dactyloides* (Nutt.) Engelm.

Bismarck ecotype buffalograss has been assigned the NRCS accession number 9057442 and the Plant Introduction (PI) number 590427. Bismarck ecotype buffalograss has been developed to provide an adapted source for use in the Northern Great Plains, primarily for reduced maintenance plantings, xeric landscaping, and prairie restoration.

**ORIGIN:** Bismarck ecotype buffalograss is a composite of two accessions (ND-2104 and ND-2503) collected in North Dakota. ND-2104 was a vegetative collection made by Bonnie HeideI in 1985 on a very shallow range site in Dickey County, North Dakota (NE1/4NE1/4 sec. 19, T. 129 N., R. 65 W.). This site on the Johnson Gulch Wildlife Management Area has an elevation of approximately 1,800 feet and a mean annual precipitation of 19.5 inches. ND-2503 was a vegetative collection made by Dwight Tober in 1986 on a clayey range site in Morton County, North Dakota (NE1/4SE1/4 sec. 12, T. 139 N., R. 82 W.). This site has an elevation of about 1,800 feet and a mean annual precipitation of 15.9 inches.

Six subsamples of each of the original vegetative collections were evaluated in a spaced plant nursery in 1986 and 1987 at Mandan, North Dakota. No differences were noted in plant vigor, size, or general plant characteristics. Rate of spread and plant vigor were excellent for both accessions. The original plants of both accessions were vegetatively removed in 1987 from the Mandan site and transplanted to the Bismarck Plant Materials Center (PMC). Subsamples were taken from each plant and randomly planted to an increase field which was enlarged each year through 1990. Transplanting survival has been excellent.

**ECOTYPE DESCRIPTION:** Buffalograss is a warm-season, sod-forming grass. It reproduces by seed and by stolons or runners which take root and produce new plants at the nodes. Buffalograss is dioecious with male and female inflorescences occurring on separate plants. Male plants produce pollen in one-sided spikes on stems. Female plants bear flowers and produce seed in bur-like capsules near the ground.



Bismarck ecotype buffalograss does not differ significantly from the general taxonomic description of buffalograss. The increase field is predominantly male with very few female plants observed. The average height of the bluish-green leaves is 4 inches. Average height of the male spikelets is 5 inches.

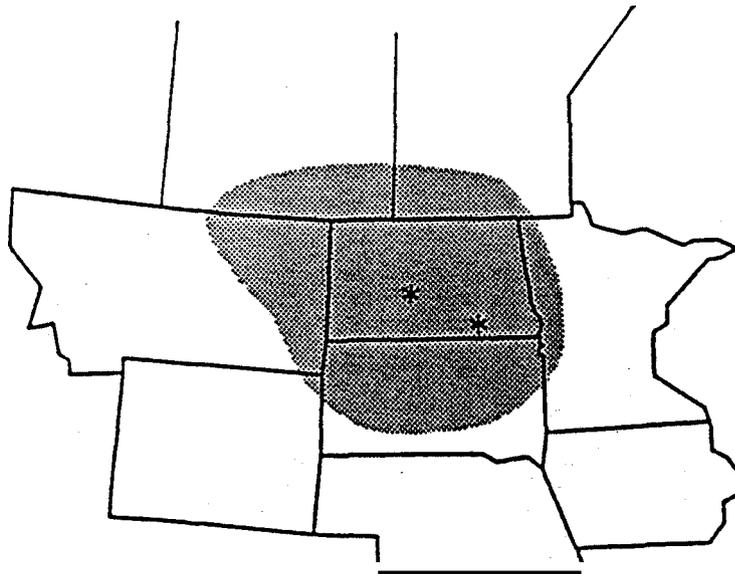
**SITE DESCRIPTION:** Buffalograss is commonly found in the short-grass region of the Great Plains. According to Johnson and Nichols (1982) it does not occur in the Canadian Provinces. This grass is common in southwestern North Dakota, but is uncommon east of the Missouri River. It is rare or absent in the northern part of the state (Stevens 1963).

Buffalograss is often associated with blue grama on thin upland soils. In draws and on claypan lowlands, buffalograss sometimes forms pure, dense mats of limited extent (Weaver 1954). The two vegetative collections that were combined to create Bismarck origin buffalograss were from locations 120 miles apart. The eastern-most collection (ND-2104) was made in western Dickey County, Major Land Resource Area (MLRA) 53B (USDA 1981). The soils series at this site is a Sioux loam. This series consists of deep, excessively drained, very rapidly permeable soils on outwash plains, eskers, and terraces, with inclusions of other soils. Slope ranges from 1 to 15 percent. The second collection (ND-2503) was from west of the Missouri River, in Morton County, which is in MLRA 54. The soil series at this site is a Lawther silty clay. The Lawther series consists of deep, moderately well-drained, fine-textured, level to nearly level soils on fans and uplands. Most slopes are nearly level. These soils formed in alluvium and in material weathered from shale. The precipitation at these two sites ranges between 16 to 20 inches. More than 75 percent of this falls during the 6-month period from April through September. The temperatures during the year may climb above 100°F in the summer, and plunge to -40°F in winter. The growing season is approximately 130 to 140 days.

**PLANT PERFORMANCE:** Bismarck ecotype buffalograss has been compared with varieties 'Texoka' and 'Prairie' in initial evaluation trials at the Bismarck Plant Materials Center. Both Texoka and Prairie, which are from the Southern Plains, were removed due to severe winter injury within one year of planting. Bismarck ecotype buffalograss has had only minor, if any, winter injury.

Because Bismarck ecotype buffalograss is predominantly a male population, plant material made available for field plantings has been vegetative. Plugs measuring 3 inches in diameter were sent to a limited number of test sites. Table 1 lists the plant performance data for a number of plantings made from 1990 to 1994. In a trial planting made in May 1992 at the Plant Materials Center, 3-inch diameter plugs grew to cover an area averaging 22 inches in diameter by the end of the growing season. Precipitation during the growing season totaled 8.3 inches. At the end of the second growing season, those same plants averaged 42 inches in diameter (Table 2). When plugs are spaced on 1-foot centers in a prepared seedbed with good weed control, the spread from stolons will result in about 80 percent groundcover in one growing season.

The predicted area of adaptation is shown on the map, with asterisks (\*) marking the locations of the original collections.



**MANAGEMENT CONSIDERATIONS:** Growth on buffalograss begins in late spring and continues during the warm days of summer. It has the ability to go dormant and recover rapidly after long periods of drought. Its palatability and adaptation to a wide range of soils and climatic conditions make it an important forage species of the Great Plains. Buffalograss is persistent and provides an excellent ground cover. Reproduction by stolons makes it ideally suited for erosion control on range and pasturelands, or critical area plantings. There is increasing interest in using buffalograss for prairie restoration, low maintenance turf, and xeric landscaping.

Bismarck ecotype buffalograss can only be established by vegetative plugs or sodding. The use of plugs or sod pieces is a very effective way to establish buffalograss on relatively small areas, as it is possible to decrease the time required to establish a cover on the planted area. Plugs are helpful when early landscape aesthetics or soil stabilization are important. When spring planted, 3 to 4-inch diameter plugs placed 1 foot apart usually result in nearly complete vegetative cover by the end of the growing season. Plugs should be placed in a prepared seedbed for best results. Watering during dry periods and controlling weeds are highly desirable in semiarid regions for rapid establishment. Periodically mowing the turf stand at a 2 to 3-inch height will reduce weed competition. Once established, the buffalograss stand can be maintained with no irrigation. However, a spring irrigation may help the stand green up sooner. Also the stand can benefit from some additional water during the period of active stolon development in late July through August (deShazer, et al. no date).

**RELEASE JUSTIFICATION:** Currently there are no cultivars of buffalograss adapted to the climate of the Northern Great Plains. Seed and vegetative material available on the commercial market is from southern origins and is not hardy in the Northern Great Plains. Bismarck ecotype buffalograss has been developed to fill this need.



**AVAILABILITY OF PLANT MATERIALS:** Clonal material (Generation 1) of Bismarck ecotype buffalograss is available from the USDA-NRCS Plant Materials Center, 3308 University Drive, Bismarck North Dakota 58504-7564. Limited quantities of vegetative material is currently available from commercial vendors.

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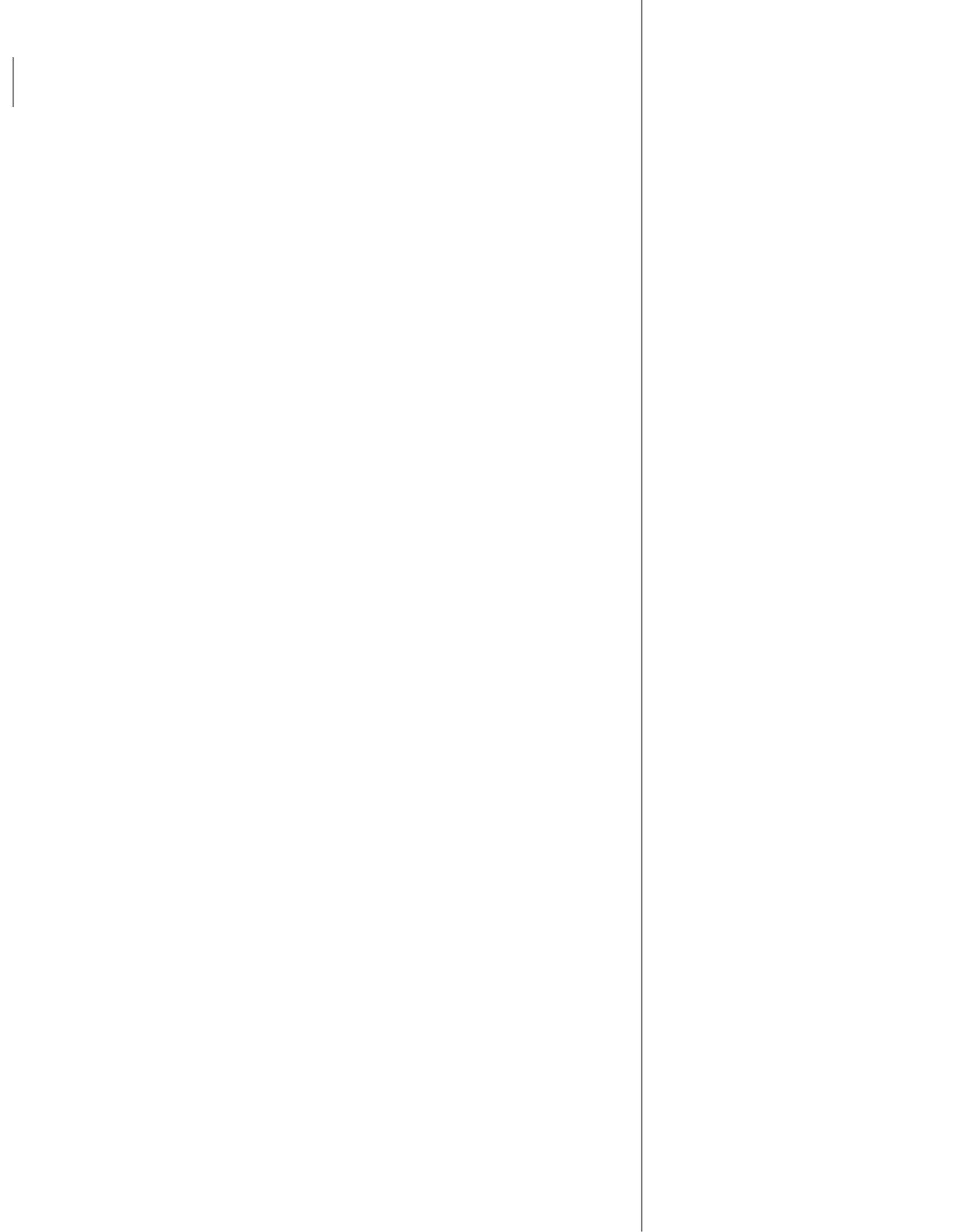
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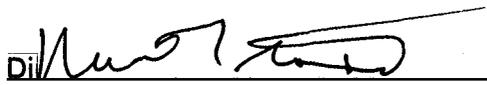
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APPROVALS:

  
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State Conservationist **ACTING**  
United States Department of Agriculture  
Natural Resources Conservation Service  
Bismarck, North Dakota

3-5-96  
Date

  
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North Dakota State University  
Agricultural Experiment Station  
Fargo, North Dakota

3-10-96  
Date

TABLE 1: BUFFALOGRASS FIELD PLANTINGS

LOCATION	NO. PLUGS	DATE RECD	PLTG. SITE INFO	PLTG. DATE	% SURV.	PLTS. WATERED	PLT. SPACING	STOLON SPREAD	PLANT VIGOR	PLT. PERF.	COMMENTS
Williston, ND	25	1990	Max loam soil with 1% slope or less	6/90	100	Once just after pltg.	12 in.	12 in.	Good	Good	Sprayed with MCPA & bromoxynil at 5 oz./acre a.i. in 1991 and 1992
Mandan, ND	200	1992	Cabba clay, near level slope SW side of church in sun	17/92	95	Yes	12 sq. in.	16-22 in. dia.	~ G o O ~	G o o ~	Approx. 25% area covered after 1st growing season. Cool summer & soil conditions.
Sandpoint, ID	96	1992	Full sunlight; no slope mission-loam soils	5/27/92	Difficult because of weed cover, dormant	Yes	12 1/2 in. Centers	Difficult to tell with weeds present	Poor	~ G o O ~	Problem with weeds. Will treat with Buctril.
LaMoure, ND	16	1992	Egeland-Embden soils 3-6% slope; S. side bldg.	5/4/??	94, 1 was run over & roots dried out	Yes	2 rows of 8 plts. ea., 2 ft. in row; 1 ft. between rows	30 in.	Excel- lent	Good	No diseases, no insects, patch invaded twice by kochia, later pulled.
Bismarck, ND	20?	1991?	Sandy, loam soil S. facing slope, 5-15%	6/20/91	99	some	12 in.	4-6 in. diameter after 1st summer; isolated plts. 12-18 in. dia.	Excel- lent	Excel- lent	Kentucky bluegrass was eliminated with Roundup. Annual weeds hand pulled. No future problems expected.
Rugby, ND	16	1992	Gardena silt loam; 1% slope facing N.	4/28/92	100	No	12 in.	11 in. max. width from 5-17 in. Dry conds. Stolons unable to root.	Excel- lent	Excel- lent	Synthetic weed barrier placed on west edge. No disease or insect problem. Weed competition strong. Rainfall limited.

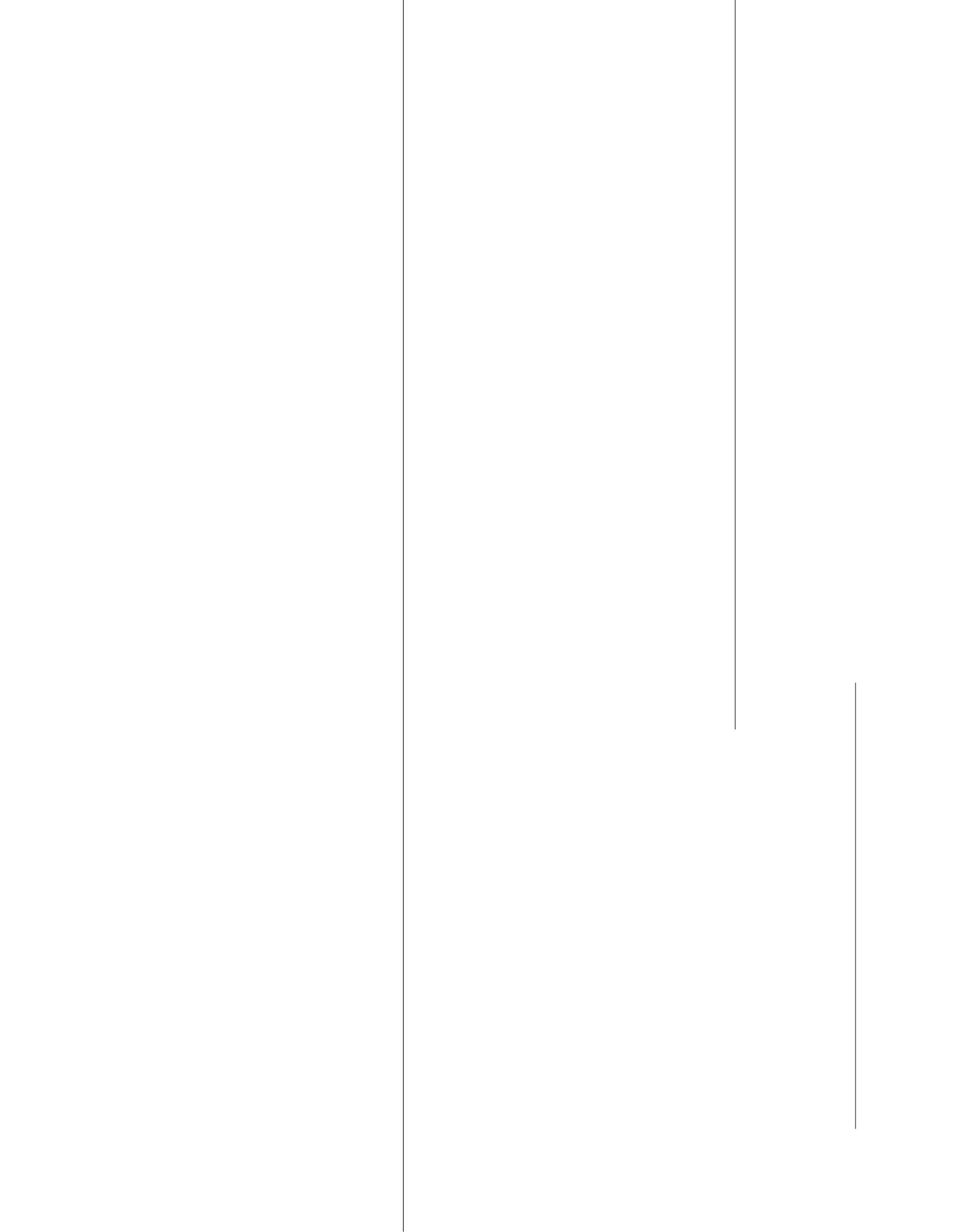


TABLE 1: BUFFALOGRASS FIELD PLANTINGS, cont.

LOCATION	NO. PLUGS	DATE RECD	PLTG. SITE INFO	PLTG. DATE	*% SURV.	PLTS. WATERED	PLT. SPACING	**STOLON SPREAD	PLANT VIGOR	PLT. PERF.	COMMENTS
North Platte, NE	25	1991	Cozad silt loam; no slope; open on S., protected on N.	6/15/91	20	Yes	15 in.	6 in.	Fair	Fair	Good dark color
Fargo, ND	120 ?	1990 1992	Flat; full sun; heavy clay	6/10/91	100	Yes	18 in.	Plugs 2 in. when pltd. covered 90% 1st yr; 100% 2nd yr.	Excel- lent	Excel- lent	No disease or insect problems; weeds hand pulled; responded well to 3 in. mowing hgt.; looked good unmowed; recorded 1 fertilization.
Minneapolis, MN	25	1991	Clay loam fill on top of clay/rock, flat; 22 plugs S. exposure; 3 shady E. died.	1 wk. after recd.	88 (sunny area)	Yes	6 in.	20 in.	Excel- lent	Good	No problems - smothered weeds; grew slow at first. Burned in spring; rake pulls up stolons; no problem with insects, fungus or mildew.
Fargo, ND	25	1991	Plants used as greenhouse material and pollen parents	1991	80	Yes	pot pltd.	N/A	~ G o o ~ G o o ~		No apparent disease or insect problem. ND buffalograss will be an important source of cold resistance genes in buffalograss.
Rugby, ND	86	1994		6/28/94	95	No received 14 in. of precipitation	36 in.		Good	Good	

\*Average % survival rate is 86.

\*\*Average stolon spread is 16 inches.