

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
SOUTH DAKOTA SUPPLEMENTS ITALICIZED**

PASTURE AND HAY PLANTING

(ac.)
CODE 512

DEFINITION

Establishing native or introduced *perennial* forage species.

PURPOSES

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- * Establish adapted and compatible species, varieties, or cultivars.
- * Improve or maintain livestock nutrition and/or health.
- * Extend the length of the grazing season.
- * Reduce soil erosion by wind and/or water.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on cropland, hayland, pastureland, and other agricultural lands where forage production is feasible and desired.

CRITERIA

General criteria applicable to all the purposes stated above.

A seedbed will be prepared that is free of all competing vegetation and is not subject to erosion. A firm seedbed will be provided in all cases. A seedbed is firm enough when it will support the weight of an average person and their boot heels do not sink into the soil over a maximum of one-half inch, when they walk across the area to be seeded. Seedbeds that are too soft may be firmed by harrowing, packing with two or more passes with an empty press drill, or using a commercial or homemade seedbed packer.

When planning seeding the previous two years of herbicide application should be considered. Any potential carryover problems should be addressed

by delaying seeding, establishing a cover crop, and/or changing species to be planted.

The presence or absence of weed populations, especially noxious weeds, will impact seedbed preparations. Each field should be evaluated for weed pressure. Seeding on fields with significant weed populations will be delayed until weeds are controlled. This may mean a protective cover crop may need to be planted.

If the existing seedbed has an erosion, weed, or chemical carryover problem, a protective cover crop will be established. The permanent seed mixture will then be drilled into the undisturbed, dead cover crop during the proper seeding dates.

Alternative temporary cover crops

Cover Crop	Minimum Seeding Rates	Seeding Dates
<i>Oats or Barley</i>	<i>3/4 bu/ac</i>	<i>April 1 - June 1</i>
<i>Sudangrass</i>	<i>8 lbs./ac</i>	<i>June 15 - July 15</i>
<i>Grain Sorghum</i>	<i>6 lbs./ac</i>	<i>June 15 - July 15</i>
<i>Oats or Barley</i>	<i>3/4 bu/ac</i>	<i>July 15 - Aug. 15</i>
<i>Millet</i>	<i>10 lbs./ac</i>	<i>July 15 - Aug. 15</i>

Maximum row spacing for a cover crop should be 20 inches.

Prevent the temporary cover crop from producing viable seed by planting late in the growing season, killing the crop with herbicides or clipping in the late boot stage. In general, cover crop residue should be 12 inches or less in height. If it gets too tall, the excess can be clipped or harvested by haying or grazing.

If adequate crop and/or weed residue exists to protect the site from erosion they may be used in lieu of the establishment of a cover crop. Herbicides and/or tillage must be used when necessary to control weeds and volunteer grain prior to seeding.

Conservation practice standards are reviewed periodically and updated if needed. The current version of this standard is posted on our website at www.sd.nrcs.usda.gov or may be obtained at your local Natural Resources Conservation Service.

High residue producing crops such as small grains and corn may produce residue levels that are difficult for many grass drills to seed into. In these situations, it is imperative that the straw and chaff residues be adequately spread at harvest or removed from the field. The grass drill to be used must also have the capabilities of drilling into high residue seedbeds.

When conducting tillage operations to control weeds or level fields enough residue should remain to adequately protect the field from erosion. Tilled seedbeds should be firmed prior to planting if necessary.

Seeding of depleted range and pasturelands, and/or old go backfields will require the destruction of all-existing perennial and annual vegetation. This may be accomplished through chemical or mechanical means. If tillage is used, a minimum of two years of cultivation and cropping is recommended to control existing vegetation. If chemical methods are used, multiple applications are generally required to achieve satisfactory results.

Seedbed preparations for interseeding legumes (East, East Central, Black Hills, and Foothills Technical Guide areas only) into existing live vegetation are completed during seeding operations.

When over seeding legumes (East, East Central, Black Hills, and Foothills Technical Guide areas only) seedbed preparation should consist of one chisel and one disking operation or two disking operations to reduce existing vegetation prior to overseeding. Tillage should be a minimum of three inches deep. Herbicide treatments which impede the growth of existing the vegetation may be substituted for tillage operation prior to overseeding.

When planning seedbed preparation operations, the type of grass seeding equipment available will strongly influence options.

Seeding equipment will be a drill that will place the seed at the proper depth, provide a uniform flow of seed at the proper rate, and have packer wheels to press the soil firmly over the seed. In lieu of packer wheels, the area can be cultipacked after seeding.

When interseeding legumes into existing untreated perennial vegetation, the interseeder shall make a furrow at least 3 inches wide, at least 2 inches

deep, and spaced a minimum of 20 inches apart. It should be equipped to plant fluffy and free flowing grass seeds, have double disc openers, and packer wheels.

Seeding depth for loam, silty clay loams, and silty clay soils is $\frac{1}{4}$ to $\frac{3}{4}$ inch. Seeding depth for sands, loamy sands, and sandy loam soils is $\frac{1}{2}$ to 1 inch.

Broadcast seedings are not recommended, however, if site conditions or other considerations prohibit the use of a drill and make it necessary to broadcast seed, then increase seeding rate by 50 percent and harrow or cultipack after broadcasting seed.

Seeding dates that provide the best chance of success will vary from north to south and east to west with the variation in soil temperature and moisture conditions. The dates listed below are averages that may be changed two weeks in either direction depending on current conditions.

SEEDING DATES

EARLY SPRING PRIOR TO 5/15 – Best for cool season species, second best period for planting warm season species.

LATE SPRING 5/15 to 6/15 – Best period for warm season species. Do not plant cool season species during this period. Optimum period is when sustained soil temperatures reach 60 degrees F.

EARLY FALL 8/1 to 9/1 – Cool season species only, seed only if provided that soil moisture is adequate at or near the surface and to a substantial depth. Second best period for cool season species on fields with weed and management problems.

DORMANT 11/1 to spring thaw – Cool season species only (with the exception of switchgrass). Third best period for cool season species. Soil temperature should be at 40 degrees F or less at 10:00 a.m. to prevent germination

Table 1 contains seeding rates and number of seeds per PLS pound for approved species. Seeding rates are based on 30 PLS per square foot. When two grass species are used, the amount of seed should be equal portions. Equal portions means, when two grass species are seeded, multiply the amount of seed needed for a full seeding shown on Table III for each species by 50 percent or 5 tenths. If a legume is used in the mixture with two grass species, the percentage of the mixture left after determining the percentage of legume used

should be divided into equal portions between the two grass species. Seeding rates for interseeding legumes should be one-half the rate shown on Table 1. For overseeding legumes use the same seeding rates found in Table 1.

Generally, seed should not be mixed together at the time of purchase. Only seeds with similar characteristics (i.e. fluffy, slick and large, slick and small) should be mixed together. Mixing seeds, which do not have similar characteristics, makes drill calibration difficult and may result in uneven stands.

No nurse crops (oats or other small grain planted at the same time as grass seed) will be allowed. If a carrier is needed to help feed seed through the drill, cracked corn or rolled oats may be added to the mixture.

Table 2 lists characteristics of all species contained in Table 1. Table 3 lists species adaptability by Pasture and Hayland Suitability Groups and South Dakota Technical Guide areas. Information contained in these tables will be used to select species that meet client objectives and resource needs and are best suited to the intended use and site characteristics.

Do not mix warm season and cool season grasses for hayland use. Legumes can be seeded with cool-season grasses if both the legume and the grass are suited to the site. Do not mix native and introduced grasses unless the phenology, morphology, and seedling vigor of selected species is similar. Generally, tall wheatgrass, reed canarygrass, or Russian wildrye will be seeded alone.

Species planned for seeding pastureland should be compatible with the planned management of the entire operating unit. Select species that provide good forage during the season pasture will be used for grazing.

For ease of management and proper use, pasture and hayland mixtures should consist of no more than two grass species having similar growth habits and similar seasons of use. These may be planted with or without legumes.

Generally, cool season pasture mixtures containing legume will produce higher yields and better quality forage than will pure grass seedings. Percent of legumes in the mixture should not exceed 50 percent (PLS basis) of the amount shown in Table 1 as needed for a full seeding.

(Pasture-type alfalfa or nonbloating legumes will be used.) The landuser should be aware of the bloat hazard when legumes are included in pasture mixes.

On slopes over 6 percent, 75 percent of the seed mixture (PLS basis) should be sod forming species.

Cool season hayland mixtures containing legumes will produce higher yields and better quality forage than will pure grass seedings. Percent of legumes in the mixture will not exceed 75 percent (PLS basis) of the amount shown on Table 1 as needed for a full seeding. Hayland type alfalfa should be used.

Russian wildrye, because of its basal leaf-growth characteristics, is not suitable for hay production.

Adapted improved varieties of native grasses, forbs and shrubs have been developed and released and should be used when available. When named varieties are not used, utilize seed from as near as possible to the area being seeded. Ideally, seed with a variety not stated (VNS) should be from a source no more than 300 miles south and 150 miles north of the area to be seeded. At a maximum the seed will have an origin of one of the states that surround South Dakota (MT, WY, NE, MN, ND, and IA). Table 4 provides a list of approved varieties of grasses and legumes.

Use certified seed when available.

Seed must meet all state seed laws. Germination tests must have been completed within nine months of planting. A farmer or rancher who raises his own seed will have it tested for germination and purity.

Legume seed shall be inoculated with the proper viable rhizobia before planting.

All seeding mixtures will be calculated on a PLS basis. The percent PLS is calculated by multiplying the percent germination (includes hard seed) by the percent purity and dividing by 100. The amount of bulk seed required to be planted can be calculated by dividing the PLS lb./ac to be seeded by the percent PLS of the bulk seed.

Pasture and Hayland seedings will be protected from domestic grazing from the date of seeding for at least one growing season (3/1 to 11/1), or longer if the seeding is not well established at the end of the first year. Light to moderate levels (less

than 30 percent utilization) of grazing are allowed during the dormant season.

During the establishment period, excessive amounts of competitive weeds will be controlled by either herbicides or by clipping. Control weeds that compete with seedlings for sunlight and/or moisture during the growing season of the species planted. Clip weeds when they reach a height of six to eight inches. Clipping shall be done before seed development, or prior to significant soil moisture competition. Herbicides may also be applied to control weeds. Consult the practice 595 Pest Management and the South Dakota Nutrient and Pesticide Management Guide for herbicide recommendations.

Fertilization has not proven beneficial to grass seedlings and is not generally recommended.

CONSIDERATIONS

Prescribed Burning, Prescribed Grazing, Brush Management, and Grazing Land Mechanical Treatment practices may be used in combination with Pasture and Hay Planting.

Where wildlife management is an objective, the food and cover value of the planting can be enhanced by using an approved habitat evaluation procedure to aid in selecting plant species and providing for other habitat requirements necessary to achieve the objective.

PLANS AND SPECIFICATIONS

Specifications for the establishment of pasture and hay plantings shall be prepared for each site or management unit according to the Criteria, Considerations, and Operations and Maintenance described in this standard, and shall be recorded on specification sheets, job sheets, in narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Growth of seedlings or sprigs shall be monitored for water stress. Water stress may require reducing weeds, irrigating when possible, or replanting failed stands, depending on the severity of drought.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management by manipulating livestock stocking rates, density, and duration of stay.

Insects and diseases shall be controlled when an infestation threatens stand survival.

**TABLE 1
PASTURE AND HAYLAND PLANTING
SEEDING RATES**

ALL TECHNICAL GUIDE AREAS

NATIVE GRASSES	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound	INTRODUCED GRASSES	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound
Big bluestem	7.9	165,000	Creeping foxtail	1.5	900,000
Green needlegrass	7.8	168,000	Crested wheatgrass	6.5	200,000
Indiangrass	7.5	175,000	Intermediate wheatgrass	14.9	88,000
Little bluestem	5.0	260,000	Meadow brome	32.7	40,000
Mountain brome	14.5	90,000	Orchardgrass	2.0	654,000
Reed canarygrass	2.4	540,000	Pubescent wheatgrass	13.1	100,000
Sand bluestem	13.1	100,000	Russian wildrye	7.5	175,000
Switchgrass	3.4	389,000	Smooth brome	10.5	125,000
Western wheatgrass	11.9	110,000	Tall wheatgrass	16.5	79,000
			Timothy	1.0	1,300,000
NATIVE LEGUMES			INTRODUCED LEGUMES		
Illinois Bundleflower	21.8	60,000	Alfalfa	6.2	210,000
Purple prairieclover	4.5	290,000	Alsike clover	1.9	680,000
White prairieclover	3.4	384,000	Birdsfoot Trefoil	3.1	418,000
Canada milkvetch	4.9	266,000	Cicer milkvetch	9.0	145,000
			Red Clover	4.8	275,000
			Sainfoin	43.6	30,000
			Small Burnet	31.0	42,200

**TABLE 2
PASTURE AND HAYLAND PLANTING SPECIES CHARACTERISTICS**

Species	Growth Habit	Drought Tolerance	Flood Tolerance	Salt Tolerance	Recovery After Harvest	Best Use	Season of Use	Longevity	Grazing Preference	Stand Establishment
NATIVE WARM SEASON GRASSES										
Big bluestem	RWT	GOOD	GOOD	POOR	GOOD	BOTH	SU	LONG	HIGH	SLOW
Indiangrass	RWT	FAIR	GOOD	POOR	GOOD	BOTH	SU, F	LONG	HIGH	SLOW
Little bluestem	BWM	GOOD	POOR	FAIR	FAIR	BOTH	SU, F	LONG	HIGH	SLOW
Sand bluestem	RWT	GOOD	FAIR	POOR	FAIR	BOTH	SU, F	LONG	HIGH	SLOW
Switchgrass	RWT	GOOD	GOOD	FAIR	FAIR	BOTH	SU, F	LONG	MED.	MED.
NATIVE COOL SEASON GRASSES										
Green needlegrass	BCM	GOOD	FAIR	FAIR	GOOD	BOTH	SP, F	LONG	MED.	MED.
Mountain brome	BCM	FAIR	FAIR	FAIR	GOOD	BOTH	SP, F	SHORT	HIGH	RAPID
Reed canarygrass	RCT	FAIR	GOOD	POOR	GOOD	BOTH	SP, SU, F	LONG	HIGH	MED.
Western wheatgrass	RCM	GOOD	GOOD	GOOD	FAIR	BOTH	SP, F, W	LONG	MED.	MED.
INTRODUCED COOL SEASON										
Creeping foxtail	RCM	POOR	GOOD	POOR	GOOD	BOTH	SP, SU, F	LONG	HIGH	MED.
Crested wheatgrass	BCM	GOOD	POOR	FAIR	FAIR	BOTH	SP, F	LONG	MED.	RAPID
Intermediate wheatgrass	RCM	POOR	FAIR	FAIR	GOOD	BOTH	SP	MED.	HIGH	MED.
Meadow brome	BCM	FAIR	FAIR	POOR	GOOD	BOTH	SP, F	MED.	HIGH	MED.
Orchardgrass	RCM	POOR	POOR	FAIR	GOOD	BOTH	SP, SU, F	LONG	HIGH	RAPID
Pubescent wheatgrass	RCM	FAIR	FAIR	FAIR	GOOD	BOTH	SP	MED.	HIGH	MED.
Russian wildrye	BCM	GOOD	FAIR	FAIR	GOOD	PASTURE	SP, F, W	MED.	HIGH	MED.
Timothy	BCM	FAIR	FAIR	POOR	GOOD	BOTH	SP, F	SHORT	MED.	RAPID
Tall wheatgrass	BCT	POOR	GOOD	GOOD	FAIR	BOTH	SP, F, W	MED.	LOW	MED.
Smooth brome	RCM	POOR	GOOD	POOR	GOOD	BOTH	SP, F	LONG	HIGH	RAPID
NATIVE LEGUMES										
Illinois bundleflower	E-P	GOOD	FAIR	POOR	POOR	PASTURE	SU	LONG	HIGH	SLOW
Purple prairieclover	E-P	GOOD	POOR	POOR	POOR	PASTURE	SU	LONG	HIGH	SLOW
White prairieclover	E-P	GOOD	POOR	POOR	POOR	PASTURE	SU	LONG	HIGH	SLOW
Canada milkvetch	E-P	GOOD	POOR	POOR	POOR	PASTURE	SU	LONG	MED.	SLOW
INTRODUCED LEGUMES										
Alfalfa	E-P	GOOD	POOR	POOR	GOOD	BOTH	SP, SU	MED.	HIGH	RAPID
Alsike clover	E-P	POOR	GOOD	FAIR	GOOD	BOTH	SP, SU	SHORT	HIGH	MED
Birdsfoot trefoil	E-P	FAIR	FAIR	POOR	GOOD	BOTH	SP, SU	MED.	HIGH	RAPID
Cicer milkvetch	E-P	FAIR	FAIR	FAIR	GOOD	BOTH	SP, SU	MED.	HIGH	SLOW
Red clover	E	FAIR	FAIR	POOR	FAIR	HAY	SP, SU	SHORT	MED.	RAPID
Sainfoin	E-P	FAIR	POOR	FAIR	GOOD	BOTH	SP, SU	MED.	HIGH	MED
Small burnet	E-P	FAIR	POOR	POOR	GOOD	BOTH	SP, SU	MED.	HIGH	MED

Growth Habits: B-bunch, R-rhizomatous, C-cool season, W-warm season, S-shortgrass, less than 18" tall, M-midgrass 18-36" tall, T-tall grass over 36", E-erect, P-prostrate

Drought Tolerance: Based on species being on an adapted site.

Flood Tolerance: Good-28 to 42 days, Fair-14 to 28 days, Poor-less than 14 days. Creeping foxtail and Reed canarygrass can tolerate over 60 days of flooding.

Salt Tolerance: Based on SAR (Sodium Adsorption Ratio) values - 1-5 poor, 6-10 fair, 11-14 good, no species available for 15+ values

Recovery after Harvest: Based on adequate soil moisture.

Season of Use: SP-spring, SU-summer, F-fall, W-winter

Longevity: Short 1-4 years, Medium 5-10 years, long-longer than ten years with proper management.

Grazing Preference: Based on season of rapid growth. Palatability is relative, depending on quantity, quality, and availability of other species

Stand Establishment: Rapid - usually one growing season after planting, medium - usually 1-2 growing seasons after planting, Slow - usually 2-3 growing seasons after planting.

TABLE 3
SPECIES ADAPTABILITY BY PASTURE GROUP
EASTERN TECHNICAL GUIDE AREA
MLRAS 102A, 102B

PASTURE AND HAYLAND SUITABILITY GROUPS (See Section II-k of the SD Technical Guide)													
NATIVE GRASSES	A	B1	B2	C	D1	D2	E	F	G	H	I	J	K
Big bluestem	G	NS	NS	P	F	P	G	G	G	F	G	NS	G
Green needlegrass	F	NS	NS	G	G	G	G	G	G	F	G	NS	F
Indiangrass	G	NS	NS	P	F	P	G	G	P	G	G	NS	G
Little bluestem	F	NS	NS	F	G	G	G	G	G	G	G	NS	G
Mountain brome	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Reed canarygrass	G	G	G	NS	NS	NS	NS	NS	NS	NS	NS	NS	F
Sand bluestem	NS	NS	NS	NS	NS	NS	P	P	NS	G	P	NS	NS
Switchgrass	G	NS	NS	F	F	P	G	G	P	G	G	NS	G
Western wheatgrass	F	P	G	G	G	G	G	G	G	F	G	G	F
INTRODUCED GRASSES													
Creeping foxtail	G	G	G	NS	NS	NS	NS	NS	NS	NS	NS	NS	G
Crested wheatgrass	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Intermediate wheatgrass	F	NS	NS	G	G	F	G	G	F	F	G	F	G
Meadow bromegrass	F	NS	NS	F	G	F	G	G	F	F	G	NS	G
Orchardgrass	F	NS	NS	F	G	P	G	G	P	F	G	NS	G
Pubescent wheatgrass	F	NS	NS	G	G	G	G	G	G	G	G	F	G
Russian wildrye	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Smooth bromegrass	F	NS	NS	G	G	F	G	G	F	F	G	NS	G
Tall wheatgrass	F	NS	NS	G	G	F	G	G	F	F	G	G	G
Timothy	F	NS	NS	F	G	NS	G	G	F	F	G	NS	G
NATIVE FORBS													
Illinois Bundleflower	F	NS	NS	F	G	G	G	G	F	F	G	NS	G
Purple prairieclover	P	NS	NS	F	G	G	G	G	G	G	G	NS	F
White prairieclover	P	NS	NS	F	G	G	G	G	G	G	G	NS	F
Canada milkvetch	P	NS	NS	F	G	G	G	G	F	G	G	NS	G
INTRODUCED LEGUMES													
Alfalfa	NS	NS	NS	F	G	P	G	G	F	G	G	NS	G
Alsike clover	G	NS	NS	F	F	NS	P	P	P	P	P	NS	G
Birdsfoot Trefoil	NS	NS	NS	F	G	P	G	G	F	G	G	NS	G
Cicer milkvetch	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Red Clover	NS	NS	NS	NS	F	P	G	G	F	F	G	NS	G
Sainfoin	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Small burnet	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

G - Species well adapted to site

F - Species adapted to site but will not produce at it's highest potential

P - Species poorly adapted to site. It will survive but will not produce well below the potential for the species

NS - Species is not adapted to the site and should not be planted.

TABLE 3 (Cont'd)
SPECIES ADAPTABILITY BY PASTURE GROUP
EAST CENTRAL TECHNICAL GUIDE AREA
MLRAS 53B, 53C, 55C, 63B, 66

PASTURE AND HAYLAND SUITABILITY GROUPS													
(See Section II-k of the SD Technical Guide)													
NATIVE GRASSES	A	B1	B2	C	D1	D2	E	F	G	H	I	J	K
Big bluestem	G	NS	NS	P	F	P	G	G	G	F	G	NS	G
Green needlegrass	F	NS	NS	G	G	G	G	G	G	F	G	NS	F
Indiangrass	G	NS	NS	P	F	P	G	G	P	G	G	NS	G
Little bluestem	F	NS	NS	F	G	G	G	G	G	G	G	NS	G
Mountain brome	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Reed canarygrass	F	G	F	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sand bluestem	NS	NS	NS	NS	NS	NS	P	P	NS	G	P	NS	NS
Switchgrass	G	NS	NS	F	F	P	G	G	P	G	G	NS	G
Western wheatgrass	G	P	G	G	G	G	G	G	G	F	G	G	F
INTRODUCED GRASSES													
Creeping foxtail	F	G	F	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Crested wheatgrass	NS	NS	NS	NS	NS	F	NS						
Intermediate wheatgrass	G	NS	NS	G	G	F	G	G	F	F	G	F	G
Meadow brome	G	NS	NS	F	G	F	G	G	F	F	G	NS	G
Orchardgrass	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pubescent wheatgrass	F	NS	NS	G	G	G	G	G	G	G	G	F	F
Russian wildrye	NS	NS	NS	F	F	F	P	P	P	P	P	NS	NS
Smooth brome	G	NS	NS	G	G	F	G	G	F	F	G	NS	G
Tall wheatgrass	G	NS	NS	G	G	F	G	G	F	F	G	G	G
Timothy	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NATIVE FORBS													
Illinois Bundleflower	F	NS	NS	F	G	G	G	G	F	F	G	NS	G
Purple prairieclover	P	NS	NS	F	G	G	G	G	G	G	G	NS	F
White prairieclover	P	NS	NS	F	G	G	G	G	G	G	G	NS	F
Canada milkvetch	P	NS	NS	F	G	G	G	G	F	G	G	NS	G
INTRODUCED LEGUMES													
Alfalfa	NS	NS	NS	F	G	P	G	G	F	G	G	NS	G
Alsike clover	G	NS	NS	F	F	NS	P	P	P	P	P	NS	G
Birdsfoot Trefoil	NS	NS	NS	F	G	P	G	G	F	G	G	NS	G
Cicer milkvetch	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Red Clover	NS	NS	NS	NS	F	P	G	G	F	P	G	NS	G
Sainfoin	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Small burnet	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

G - Species well adapted to site

F - Species adapted to site but will not produce at it's highest potential

P - Species poorly adapted to site. It will survive but will not produce well below the potential for the species

NS - Species is not adapted to the site and should not be planted.

TABLE 3 (Cont'd)
SPECIES ADAPTABILITY BY PASTURE GROUP
WEST CENTRAL TECHNICAL GUIDE AREA
MLRAS 54, 63A, 64, 65

PASTURE AND HAYLAND SUITABILITY GROUPS
(See Section II-k of the SD Technical Guide)

NATIVE GRASSES	A	B1	B2	C	D1	D2	E	F	G	H	I	J	K
Big bluestem	G	NS	NS	P	F	P	G	G	G	F	G	NS	G
Green needlegrass	F	NS	NS	G	G	G	G	G	G	F	G	NS	F
Indiangrass	G	NS	NS	P	F	P	P	P	P	F	F	NS	G
Little bluestem	F	NS	NS	F	G	G	G	G	G	G	G	NS	G
Mountain brome	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Reed canarygrass	F	G	F	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sand bluestem	NS	NS	NS	NS	NS	NS	P	P	NS	G	P	NS	NS
Switchgrass	G	NS	NS	F	F	P	G	G	P	G	G	NS	G
Western wheatgrass	G	P	G	G	G	G	G	G	G	F	G	F	F
INTRODUCED GRASSES													
Creeping foxtail	F	G	F	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Crested wheatgrass	P	NS	NS	G	G	NS	G	G	F	F	G	NS	G
Intermediate wheatgrass	G	NS	NS	G	G	F	G	G	F	F	G	P	G
Meadow brome	G	NS	NS	F	F	F	G	G	F	F	G	NS	G
Orchardgrass	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pubescent wheatgrass	F	NS	NS	G	G	G	G	G	G	G	G	P	F
Russian wildrye	NS	NS	NS	G	G	NS	NS	NS	NS	NS	NS	NS	NS
Smooth brome	F	NS	NS	G	F	F	G	G	F	F	G	NS	G
Tall wheatgrass	F	NS	NS	G	G	F	G	G	F	F	G	G	G
Timothy	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NATIVE FORBS													
Illinois Bundleflower	F	NS	NS	F	G	G	G	G	F	F	G	NS	G
Purple prairieclover	P	NS	NS	F	G	G	G	G	G	G	G	NS	F
White prairieclover	P	NS	NS	F	G	G	G	G	G	G	G	NS	F
Canada milkvetch	P	NS	NS	F	G	G	G	G	F	G	G	NS	G
INTRODUCED LEGUMES													
Alfalfa	NS	NS	NS	F	G	P	G	G	F	G	G	NS	G
Alsike clover	G	NS	NS	F	G	P	G	G	F	G	G	NS	G
Birdsfoot Trefoil	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cicer milkvetch	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Red Clover	NS	NS	NS	NS	F	P	G	G	F	P	G	NS	G
Sainfoin	F	NS	NS	F	G	P	G	G	F	G	G	NS	G
Small burnet	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

G - Species well adapted to site

F - Species adapted to site but will not produce at it's highest potential

P - Species poorly adapted to site. It will survive but will not produce well below the potential for the species

NS - Species is not adapted to the site and should not be planted.

TABLE 3 (Cont'd)
SPECIES ADAPTABILITY BY PASTURE GROUP
WESTERN AND FOOTHILLS TECHNICAL GUIDE AREA
MLRAS 58D, 60A, 61

PASTURE AND HAYLAND SUITABILITY GROUPS (See Section II-k of the SD Technical Guide)										
NATIVE GRASSES	B1	B2	C	D1	E	F	G	H	I	K
Big bluestem	NS	NS	P	P	F	F	F	G	F	G
Green needlegrass	NS	NS	G	G	G	G	G	F	G	G
Indiangrass	NS	NS	NS	NS	NS	NS	NS	F	NS	F
Little bluestem	NS	NS	F	G	G	G	G	G	G	G
Mountain brome	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Reed canarygrass	G	F	NS	NS	NS	NS	NS	NS	NS	NS
Sand bluestem	NS	NS	NS	NS	P	P	NS	G	P	NS
Switchgrass	NS	NS	NS	NS	F	F	P	F	F	F
Western wheatgrass	P	G	G	G	G	G	G	F	G	G
INTRODUCED GRASSES										
Creeping foxtail	G	F	NS	NS	NS	NS	NS	NS	NS	G
Crested wheatgrass	NS	NS	G	G	G	G	G	F	G	F
Intermediate wheatgrass	NS	NS	G	G	G	G	F	F	G	G
Meadow brome	NS	NS	F	G	G	G	F	F	G	G
Orchardgrass*	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pubescent wheatgrass	NS	NS	G	G	G	G	G	G	G	F
Russian wildrye	NS	NS	G	G	NS	NS	NS	NS	NS	NS
Smooth brome	NS	NS	F	F	F	F	F	F	F	G
Tall wheatgrass	NS	NS	F	F	F	F	F	F	F	F
Timothy	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NATIVE FORBS										
Illinois Bundleflower	NS	NS	F	G	G	G	F	F	G	G
Purple prairieclover	NS	NS	F	G	G	G	G	G	G	F
White prairieclover	NS	NS	F	G	G	G	G	G	G	F
Canada milkvetch	NS	NS	F	G	G	G	F	G	G	G
INTRODUCED LEGUMES										
Alfalfa	NS	NS	F	G	G	G	F	G	G	G
Alsike clover	NS	NS	F	G	G	G	F	G	G	G
Birdsfoot Trefoil	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cicer milkvetch	NS	NS	F	G	G	G	F	G	G	G
Red Clover	NS	NS	F	F	G	G	F	P	G	G
Sainfoin	NS	NS	F	G	G	G	G	G	G	G
Small burnet	NS	NS	F	G	G	G	F	G	G	G

G - Species well adapted to site

F - Species adapted to site but will not produce at it's highest potential

P - Species poorly adapted to site. It will survive but will not produce well below the potential for the species

NS - Species is not adapted to the site and should not be planted.

* - Orchardgrass may be used under irrigation in these technical guide areas.

TABLE 3 (Cont'd)
SPECIES ADAPTABILITY BY PASTURE GROUP
BLACK HILLS TECHNICAL GUIDE AREA
MLRA 62

PASTURE AND HAYLAND SUITABILITY GROUPS (See Section II-k of the SD Technical Guide)			
NATIVE GRASSES	B1	F	F2
Big bluestem	G	G	F
Green needlegrass	NS	G	G
Indiangrass	NS	NS	NS
Little bluestem	NS	F	F
Mountain brome	NS	G	G
Reed canarygrass	G	NS	NS
Sand bluestem	NS	NS	NS
Switchgrass	G	NS	NS
Western wheatgrass	F	G	G
INTRODUCED GRASSES			
Creeping foxtail	G	NS	NS
Crested wheatgrass	NS	F	F
Intermediate wheatgrass	NS	G	G
Meadow brome	NS	F	F
Orchardgrass	NS	NS	NS
Pubescent wheatgrass	NS	F	F
Russian wildrye	NS	NS	NS
Smooth brome	NS	G	G
Tall wheatgrass	NS	F	F
Timothy	NS	G	G
NATIVE FORBS			
Illinois Bundleflower	NS	G	G
Purple prairieclover	NS	G	G
White prairieclover	NS	G	G
Canada milkvetch	NS	G	G
INTRODUCED LEGUMES			
Alfalfa	NS	NS	NS
Alsike clover	G	G	G
Birdsfoot Trefoil	NS	NS	NS
Cicer milkvetch	F	G	G
Red Clover	G	G	G
Sainfoin	F	G	G
Small burnet	F	G	G

G - Species well adapted to site

F - Species adapted to site but will not produce at it's highest potential

P - Species poorly adapted to site. It will survive but will not produce well below the potential for the species

NS - Species is not adapted to the site and should not be planted.

TABLE 4. ALLOWABLE GRASS VARIETIES FOR SOUTH DAKOTA

*NATIVE WARM SEASON***Big Bluestem**

Common*
Bison
Bonilla
Champ
Pawnee
Sunnyview

Indiangrass

Common*
Holt
Tomahawk

Little Bluestem

Common*
Badlands
Blaze
Camper

Sand Bluestem

Common*
Garden
Goldstrike

Switchgrass

Common*
Dacotah
Forestburg
Nebraska-28
Pathfinder
Summer
Sunburst
Trailblazer

*NATIVE COOL SEASON***Green Needlegrass**

Common*
Lodorm

Mountain Bromegrass

Common*
Bromar

Reed Canarygrass

Common*
Frontier
Ioreed
Palaton
Rise
Vantage
Venture

Western Wheatgrass

Common*
Flintlock
Rodan
Rosana

*INTRODUCED COOL SEASON***Creeping Foxtail**

Common*
Garrison
Retain

Crested Wheatgrass

Common*
Hycrest
Fairway
Nordan
Ruff
Summit

Intermediate Wheatgrass

Common*
Chief
Clarke
Oahe
Reliant
Slate

Meadow Bromegrass

Common*
Fleet
Paddock
Regar

Orchardgrass

Common*
Chinook
Kay
Potomac

Pubescent Wheatgrass

Common*
Manska
MDN-759
Greenleaf
Luna

Russian Wildrve

Common*
Mankota
Bozoisky Select
Vinall
Mayak
Sawki
Swift

Timothy

Common*
Climax
Hopkins
Drummond

Tall Wheatgrass

Common*
Alkar
Orbit
Platte

Smooth Bromegrass

Common*
Bounty
Carlton
Cottonwood
Fox
Lincoln
Manchar
Rebound
Sac
Signal

*NATIVE LEGUMES***Illinois Bundleflower**

Common*

Purple Prairieclover

Common*
Kaneb

White Prairieclover

Common*

Canada Milkvetch

Common*
Sunrise

*INTRODUCED LEGUMES***Alfalfa**

Common*
Improved varieties ^{1/}

Alsike Clover

Common*

Birdsfoot Trefoil

Common*
Empire
Viking

Cicer Milkvetch

Common*
Lutana
Monarch

Red Clover

Common*
Kenland
Mammoth

Sainfoin

Common*
Eski

Small Burnet

Common*
Delar

* The origin of non-variatal native and introduced grass seed will be limited to North Dakota, South Dakota, Minnesota, Nebraska, Montana, and Wyoming. All foreign seed, including Canadian, must be adapted named varieties.

^{1/} Alfalfa varieties must have a fall dormancy rating of three or less to meet specifications