

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

RANGE PLANTING

(ac.)

CODE 550

DEFINITION

Establishment of adapted *native* perennial vegetation such as grasses, forbs, legumes, *and* shrubs.

PURPOSES

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

- Restore a plant community similar to its historic climax or the desired plant community.
- Provide or improve forages for livestock.
- Provide or improve forage, browse or cover for wildlife.
- Reduce erosion by wind and/or water.
- Improve water quality and quantity.

CONDITIONS WHERE THIS PRACTICE APPLIES

On rangeland, native or naturalized pasture, grazed forest or other suitable location where the principle method of vegetation management will be with herbivores. This practice shall be applied where desirable vegetation is below the acceptable level for natural reseeding to occur, or where the potential for enhancement of the vegetation by grazing management is unsatisfactory.

CRITERIA

General Criteria Applicable For 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

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.

late boot stage. In general, cover crop residue should be taller than 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.

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 levels.

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 pastureland, and/or old go back fields 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. Litter may need to be reduced to allow for good seed-to-soil contact.

Seedbed preparations for interseeding recommended species into existing live vegetation are completed during seeding operations.

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 into existing, untreated perennial vegetation, the interseeder shall make a furrow at least 8 inches wide, at least 3 inches deep, and not spaced more than 42 inches between furrow centers. 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.

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 current 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 soil moisture is adequate at or near the surface and to a substantial depth. Second best period for cool season grasses. Best period for cool season species on fields with weed 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 a.m. to prevent germination

Table 1 contains species recommendations and seeding rates based on range sites and South Dakota Technical Guide areas. All seedings will contain a minimum of four species unless otherwise specified. If two or more range sites are seeded together, the same species can be counted toward the minimum of four species on each range site, if they meet specification and the species with minimum percentage requirements for each site are included in the mixture. Limits are set for the minimum and maximum percentage for each species. All mixtures should total 100 percent.

Seeding rates of plus or minus 20 percent of the recommended rate will be considered as meeting this standard.

Seeding rates for interseedings should be one-half the rate shown on 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.

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 (Montana, Wyoming, Nebraska, Minnesota, North Dakota, and Iowa). Table 2 provides a list of allowable varieties of native grasses, forbs, and shrubs.

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.

All seeding mixtures will be calculated on a Pure Live Seed (PLS) basis. The percent PLS is calculated by multiplying the percent germination (includes hard seed) by the percent purity. 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.

Range seedings (full and interseedings) will be protected from domestic grazing from the date of seeding for at least two consecutive growing seasons (3/1 to 11/1), or longer if the seeding is not well established at the end of two years. Light to moderate levels (less than 30 percent utilization) of grazing are allowed during the dormant season.

After the two years of protection, interseeded areas should be carefully monitored so that the interseeded grasses are not over utilized. Base proper use of these areas on the use of the interseeded species and not on the existing vegetation growing between the furrows.

During the two-year 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 native grass seedings and is not recommended.

Additional Criteria For Improved Forages For Livestock.

Selection of a species or combination of species shall be designed to meet the desired nutritional and palatability requirements for the kind and class of livestock for the intended season of use.

Selection of species or combination of species shall be designed to meet the desired season of use or grazing period.

Additional Criteria For Improved Water Quality And Quantity.

Select a species or combination of species that will maintain a stable soil surface and increase infiltration.

Species that have high evapotranspiration rates, such as some woody species and phreatophytes, shall not be planted when watershed yields are the primary objective.

Additional Criteria For Improving Forage, Browse Or Cover For Wildlife.

Selection of planted species shall meet dietary and palatability requirements for the intended wildlife species.

Species will be selected and planted in a designed manner that will meet the cover requirements of the wildlife species of concern.

CONSIDERATIONS

Planting materials selected should contribute to wildlife and aesthetics when opportunities exist.

Other practices such as Brush Management, Herbaceous Weed Management, or Grazing Land Mechanical Treatment may be used to promote a satisfactory site preparation to insure a successful range planting.

PLANS AND SPECIFICATIONS

For standard plantings, appropriate forms, worksheets, etc., *will* be used to develop specifications and documentation. Plantings that require more detailed information, may require the use of other practices prior to planting and require a specific site specification prepared.

OPERATION AND MAINTENANCE

Operation: Identify any required items needed to assist in stand establishment such as mowing,

burning, flash grazing and herbicides to control weeds. Address insect and disease control needs where they are likely to create establishment problems.

Maintenance: Any necessary replanting due to drought, insects or other uncontrollable event which prevented adequate stand establishment should be addressed as soon as possible. Recommendations may vary from complete re-establishment to overseeding or spot replanting. Thin stands may only need additional grazing deferment during the growing season.

TABLE 1. RANGE SEEDING RATES AND MIXTURES
Eastern Technical Guide Area - MLRAS 102A & 102B
Minimum and Maximum Percentage of Species per Range Site (Four Species Minimum)

Species	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound	Number of seeds per sq. ft. at 1 PLS lb per ac.	Cy & Si	COv, LOv	Cp	Lsb, Ssb	SL^{2/}	Sa & Sy	Sw, SwC, TU	SM^{2/}, WL, & WM	SwG & VSw	Sb
Alkali sacaton	0.6	1,758,000	40.4					0-30					
American sloughgrass	0.9	1,150,000	26.4								0-10		
Big bluestem	6.6	165,000	3.8	10-25	20-40		10-40		0-20	10-20		0-10	30-60
Blue grama	1.3	825,000	18.9			0-20			0-10	0-10		0-20	
Canada Wildrye	9.5	115,000	2.6		0-10		0-10						0-10
Green needlegrass	6.5	168,000	3.9	0-20	0-25	0-30	0-20			0-30		0-15	
Indiangrass	6.2	175,000	4.0	0-20	10-30		0-10		0-20	0-10			10-30
Little bluestem	4.2	260,000	6.0	15-30	0-20	0-15	10-50		10-30	10-30		10-25	0-25
Needleandthread	9.5	115,000	2.6	0-10		0-15	0-10		0-20	0-20		0-25	
Nuttall alkaligrass	1.1	1,000,000	23.0					0-30					
Porcupinegrass	19.1	57,000	1.3	0-20	0-10				0-20	0-10			
Prairie cordgrass	6.0	183,000	4.2					0-20			0-60		
Prairie dropseed	4.9	224,000	5.1						0-10	0-10			
Prairie sandreed	4.0	273,000	6.3	0-10		0-10			10-20	0-10			
Reed canarygrass	2.0	540,000	12.4								0-10		
Sand bluestem	10.9	100,000	2.3						0-30				
Sideoats grama	5.7	191,000	4.4	0-15	0-10	10-20	0-10		0-10	0-20		10-20	
Slough sedge	4.7	230,490	5.3								0-60		
Switchgrass	2.8	389,000	8.9	0-20	0-30	0-10	0-10	20-50	0-20	0-10			0-25
Virginia wildrye	11.3	96,000	2.2		0-10		0-10						0-10
Western wheatgrass	9.9	110,000	2.5	0-20	0-20	25-50		20-70	0-20	0-20	0-10	0-15	0-10
Whitetop	2.4	457,000	10.5								0-50		
FORBS^{1/}													
Black samson	9.5	115,000	2.6	0-5		0-5			0-5	0-5		0-5	
Canada milkvetch	4.1	266,000	6.1	0-5		0-5			0-5				
Dotted gayfeather	8.0	136,000	3.1	0-5		0-5			0-5	0-5		0-5	0-5
Illinois bundleflower	18.2	60,000	1.4	0-5		0-5			0-5	0-5		0-5	
Maximilian sunflower	4.4	250,000	5.7	0-5	0-5	0-5	0-5		0-5				
Plains coreopsis	0.7	1,650,000	37.9								0-5		
Prairie coneflower	1.5	737,000	16.9	0-5		0-5			0-5				0-5
Purple prairieclover	3.8	290,000	6.7	0-5		0-5			0-5	0-5		0-5	0-5
Stiff sunflower	12.8	85,000	2.0	0-5	0-5	0-5	0-5		0-5				
Western yarrow	0.4	2,800,000	64.3	0-5	0-5	0-5	0-5		0-5	0-5		0-5	
White prairieclover	2.8	384,000	8.8	0-5		0-5			0-5	0-5		0-5	
SHRUBS^{1/}													
Leadplant	6.8	161,000	3.7	0-5					0-5	0-5		0-5	
Western snowberry	16.8	65,000	1.5	0-5					0-5				

^{1/} The maximum percentage that forbs and shrubs can make of a seeding is 10 percent.

^{2/} On these sites a minimum of two species must be planted.

TABLE 1. RANGE SEEDING RATES AND MIXTURES
East Central Technical Guide Area - MLRAS 53B, 53C, 55B, 55C, 63B, 66
Minimum and Maximum Percentage of Species per Range Site (Four Species Minimum)

Species	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound	Number of seeds per sq. ft. at 1 PLS lb per ac.	Cy & Si	COv, LOv	Cp	Lsb, Ssb	SL ^{2/}	Sa & Sy	Sw, SwC, TU	SM ^{2/} , WL, & WM	SwG & VSw	Sb	CD ^{3/}	DC ^{2/}	TCp
Alkali sacaton	0.6	1,758,000	40.4					0-30								0-20
American sloughgrass	0.9	1,150,000	26.4								0-10					
Big bluestem	6.6	165,000	3.8	0-20	15-40		15-40		0-20	0-25			20-50			
Blue grama	1.3	825,000	18.9	0-10	0-10	10-25	0-10		0-20	0-25		10-25				10-40
Canada wildrye	9.5	115,000	2.6		0-10											
Green needlegrass	6.5	168,000	3.9	10-50	10-25	10-40	10-25			10-25					10-40	0-10
Indiangrass	6.2	175,000	4.0	0-20	0-20		0-20		0-20				0-25			
Little bluestem	4.2	260,000	6.0	0-30	0-20	0-20	10-50		0-30	10-40		10-25	0-25			
Needleandthread	9.5	115,000	2.6	0-20		0-20			0-20	0-20		0-30				
Nuttall alkaligrass	1.1	1,000,000	23.0					0-30								0-20
Porcupinegrass	19.1	57,000	1.3							0-10						
Prairie cordgrass	6.0	183,000	4.2								0-60					
Prairie dropseed	4.9	224,000	5.1						0-10	0-10						
Prairie sandreed	4.0	273,000	6.3	0-10		0-20			10-30	0-10						
Reed canarygrass	2.0	540,000	12.4								0-10					
Sand bluestem	10.9	100,000	2.3						0-30							
Sideoats grama	5.7	191,000	4.4	10-25	0-20	0-20	0-20		0-20	0-30		0-25			0-20	0-20
Slough sedge	4.7	230,490	5.3								0-60					
Switchgrass	2.8	389,000	8.9	0-20	0-20		0-20	0-20	0-20	0-10			10-25			
Virginia wildrye	11.3	96,000	2.2													
Western wheatgrass	9.9	110,000	2.5	0-40	0-20	0-40	0-20	20-80	10-20	10-30	0-10	0-40	0-25	100	10-70	10-60
Whitetop	2.4	457,000	10.5								0-50					
FORBS^{1/}																
Black samson	9.5	115,000	2.6	0-5		0-5			0-5	0-5		0-5				
Canada milkvetch	4.1	266,000	6.1	0-5		0-5			0-5							
Dotted gayfeather	8.0	136,000	3.1	0-5		0-5			0-5	0-5		0-5				
Illinois bundleflower	18.2	60,000	1.4	0-5		0-5			0-5	0-5		0-5				
Maximilian sunflower	4.4	250,000	5.7	0-5	0-5	0-5	0-5		0-5				0-5			
Plains coreopsis	0.7	1,650,000	37.9								0-5			0-5		
Prairie coneflower	1.5	737,000	16.9	0-5		0-5			0-5							
Purple prairieclover	3.8	290,000	6.7	0-5		0-5			05-	0-5		0-5				
Stiff sunflower	12.8	85,000	2.0	0-5	0-5	0-5	0-5		05-				0-5			
Western yarrow	0.4	2,800,000	64.3	0-5	0-5	0-5	0-5		0-5	0-5		0-5	0-5			
White prairieclover	2.8	384,000	8.8	0-5		0-5			0-5	0-5		0-5				
SHRUBS^{1/}																
Leadplant	6.8	161,000	3.7	0-5					0-5	0-5		0-5				
Western snowberry	16.8	65,000	1.5	0-5					0-5							

^{1/} The maximum percentage that forbs and shrubs can make of a seeding is 10 percent.

^{2/} On these sites a minimum of two species must be planted.

^{3/} A single species is allowable on this site.

TABLE 1. RANGE SEEDING RATES AND MIXTURES
West Central Technical Guide Area - MLRAS 54, 63A, 64, 65
Minimum and Maximum Percentage of Species per Range Site (Four Species Minimum)

Species	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound	Number of seeds per sq. ft. at 1 PLS lb per ac.	Cy & St	COv, LOv	Cp	CSa	SL ^{2/}	Sa & Sy	SwC, Sw	SM, WL ^{2/}	SwG & VSw	Sb	CD ^{3/}	DC ^{2/}	TCp	TU	LT	SH
Alkali sacaton	0.6	1,758,000	40.4					0-30								0-20			
American sloughgrass	0.9	1,150,000	26.4								0-10								
Big bluestem	6.6	165,000	3.8	0-15	10-40		0-10		0-20	0-20			25-50				0-20	0-20	
Blue grama	1.3	825,000	18.9	0-20	0-10	10-30	0-20	0-20	0-20	0-20		10-30				10-40	10-30	0-10	0-20
Canada wildrye	9.5	115,000	2.6		0-10														
Green needlegrass	6.5	168,000	3.9	10-40	10-50	0-30				0-25					10-40	0-10		20-50	0-15
Indiangrass	6.2	175,000	4.0	0-10	0-10		0-20		0-20				0-25					0-10	
Little bluestem	4.2	260,000	6.0	0-20	0-20	0-10	10-40		0-40	10-50		10-30	0-25				0-30	10-25	10-40
Needleandthread	9.5	115,000	2.6	0-20	0-10	0-20			0-25	0-20		0-30					0-30	0-20	
Nuttall alkaligrass	1.1	1,000,000	23.0					0-30								0-20			
Porcupinegrass	19.1	57,000	1.3																
Prairie cordgrass	6.0	183,000	4.2								0-60								
Prairie dropseed	4.9	224,000	5.1																0-10
Prairie sandreed	4.0	273,000	6.3	0-10	0-20	0-20	10-40		10-40	0-10		0-20							
Reed canarygrass	2.0	540,000	12.4								0-10								
Sand bluestem	10.9	100,000	2.3				0-30		0-30										
Sideoats grama	5.7	191,000	4.4	10-30	0-20	0-20	0-20		0-20	10-40		0-30			0-20	0-20	0-30	0-25	0-20
Slough sedge	4.7	230,490	5.3								0-60								
Switchgrass	2.8	389,000	8.9		0-20		0-20	0-20	0-20				0-25					0-25	
Thickspike wheatgrass ^{5/}	7.1	154,000	2.5	0-50	10-50	10-40		20-80	0-20	0-30	0-10	0-20	10-25	100	10-70	10-60	10-30	0-50	0-10
Virginia wildrye	11.3	96,000	2.2																
Western wheatgrass ^{4/}	9.9	110,000	2.5	0-50	10-50	10-40		20-80	0-20	0-30	0-10	0-20	10-25	100	10-70	10-60	10-30	0-50	0-10
Whitetop	2.4	457,000	10.5								0-50								
FORBS^{1/}																			
Black samson	9.5	115,000	2.6	0-5		0-5			0-5	0-5		0-5					0-5	0-5	0-5
Canada milkvetch	4.1	266,000	6.1	0-5		0-5			0-5									0-5	
Dotted gayfeather	8.0	136,000	3.1	0-5		0-5			0-5	0-5		0-5					0-5	0-5	0-5
Illinois bundleflower	18.2	60,000	1.4	0-5		0-5			0-5	0-5		0-5						0-5	
Maximilian sunflower	4.4	250,000	5.7	0-5	0-5	0-5	0-5		0-5				0-5					0-5	
Plains coreopsis	0.7	1,650,000	37.9								0-5			0-5					
Prairie coneflower	1.5	737,000	16.9	0-5		0-5			0-5								0-5	0-5	0-5
Purple prairieclover	3.8	290,000	6.7	0-5		0-5			0-5	0-5		0-5					0-5	0-5	0-5
Stiff sunflower	12.8	85,000	2.0	0-5	0-5	0-5	0-5		0-5				0-5					0-5	
Western yarrow	0.4	2,800,000	64.3	0-5	0-5	0-5	0-5		0-5	0-5		0-5	0-5				0-5	0-5	0-5
White prairieclover	2.8	384,000	8.8	0-5		0-5			0-5	0-5		0-5					0-5	0-5	0-5
SHRUBS^{1/}																			
Leadplant	6.8	161,000	3.7	0-5					0-5	0-5		0-5						0-5	0-5
Western snowberry	16.8	65,000	1.5	0-5					0-5									0-5	0-5

^{1/} The maximum percentage that forbs and shrubs can make of a seeding is 10 percent.

^{2/} On these sites a minimum of two species must be planted.

^{3/} A single species is allowable on this site.

^{4/} Thickspike wheatgrass may be substituted if western wheatgrass is unavailable.

^{5/} Use only if western wheatgrass is unavailable.

TABLE 1. RANGE SEEDING RATES AND MIXTURES
Western and Foothills Technical Guide Area - MLRAS 58D, 60A, 61
Minimum and Maximum Percentage of Species per Range Site (Four Species Minimum)

Species GRASSES	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound	Number of seeds per sq. ft. at 1 PLS lb per ac.	Cy & Si	BOV, COv, LOv	Cp	CSv	SU, SL ^{2/}	Sa & Sy	SwC, Sw	SwG, VSw	CD ^{3/}	DC, SDC ^{2/}	TCp	TU	LT	SH	Sb	PC
Alkali sacaton	0.6	1,758,000	40.4					0-30						0-20					
American sloughgrass	0.9	1,150,000	26.4																
Big bluestem	6.6	165,000	3.8	0-20 ^{5/}	10-30		0-20		0-30	0-15						0-20	0-20	25-50	0-20
Blue grama	1.3	825,000	18.9	0-20	0-10	0-20	0-20	0-20	0-10	0-20	10-30			10-40	0-30	0-10	0-20		
Canada wildrye	9.5	115,000	2.6																
Green needlegrass	6.5	168,000	3.9	10-50	10-30	0-30				0-25	0-15		10-25	0-10	0-20	10-30	0-15		0-20
Indiangrass	6.2	175,000	4.0	0-10 ^{6/}	0-10				0-15									0-25	
Little bluestem	4.2	260,000	6.0	0-20	0-20	0-10	10-40		10-30	20-60	0-25				20-45	10-25	10-40	0-25	10-20
Needleandthread	9.5	115,000	2.6	0-10	0-10	0-10			0-25	0-20	0-25				0-30				
Nuttall alkaligrass	1.1	1,000,000	23.0					0-30						0-20					
Porcupinegrass	19.1	57,000	1.3																
Prairie cordgrass	6.0	183,000	4.2		0-25														
Prairie dropseed	4.9	224,000	5.1														0-10		
Prairie sandreed	4.0	273,000	6.3		0-15	0-10	0-10		0-20	0-10	0-10				0-20	0-20			10-30
Reed canarygrass	2.0	540,000	12.4																
Sand bluestem	10.9	100,000	2.3						15-30							0-10			10-25
Sideoats grama	5.7	191,000	4.4	10-30	10-25	10-20			0-10	10-30	10-30		0-20	10-20	10-35	0-25	0-20		
Slough sedge	4.7	230,490	5.3																
Switchgrass	2.8	389,000	8.9	0-10 ^{5/}	0-20			0-20	0-10							0-20		0-25	0-20
Thickspike wheatgrass ^{5/}	7.1	154,000	3.5	30-60	10-50	10-40	10-30	20-80	0-20	10-50	0-15	100	30-80	10-60	10-30	0-50	0-10	10-25	0-25
Virginia wildrye	11.3	96,000	2.2																
Western wheatgrass ^{4/}	9.9	110,000	2.5	30-60	10-50	10-40	10-30	20-80	0-20	10-50	0-15	100	30-80	10-60	10-30	0-50	0-10	10-25	0-25
Whitetop	2.4	457,000	10.5																
FORBS^{1/}																			
Black samson	9.5	115,000	2.6	0-5		0-5	0-5		0-5	0-5	0-5				0-5	0-5	0-5		0-5
Canada milkvetch	4.1	266,000	6.1	0-5		0-5	0-5		0-5							0-5			
Dotted gayfeather	8.0	136,000	3.1	0-5		0-5	0-5		0-5	0-5	0-5				0-5	0-5	0-5		0-5
Illinois bundleflower	18.2	60,000	1.4	0-5		0-5	0-5		0-5	0-5	0-5					0-5			
Maximilian sunflower	4.4	250,000	5.7	0-5	0-5	0-5	0-5		0-5							0-5		0-5	
Plains coreopsis	0.7	1,650,000	37.9									0-5							
Prairie coneflower	1.5	737,000	16.9	0-5		0-5	0-5		0-5						0-5	0-5	0-5		0-5
Purple prairieclover	3.8	290,000	6.7	0-5		0-5	0-5		0-5	0-5	0-5				0-5	0-5	0-5		0-5
Stiff sunflower	12.8	85,000	2.0	0-5	0-5	0-5	0-5		0-5							0-5		0-5	
Western yarrow	0.4	2,800,000	64.3	0-5	0-5	0-5	0-5		0-5	0-5	0-5				0-5	0-5	0-5	0-5	0-5
White prairieclover	2.8	384,000	8.8	0-5		0-5	0-5		0-5	0-5	0-5				0-5	0-5	0-5		
SHRUBS^{1/}																			
Leadplant	6.8	161,000	3.7	0-5			0-5		0-5	0-5	0-5					0-5	0-5		0-5
Western snowberry	16.8	65,000	1.5	0-5			0-5		0-5							0-5	0-5		

^{1/} The maximum percentage that forbs and shrubs can make of a seeding is 10 percent.

^{2/} On these sites a minimum of two species must be planted.

^{3/} A single species is allowable on this site.

^{4/} Thickspike wheatgrass may be substituted if western wheatgrass is unavailable.

^{5/} Use only if western wheatgrass is unavailable.

^{6/} MLRA 61 only.

TABLE 1. RANGE SEEDING RATES AND MIXTURES
Black Hills Technical Guide Area - MLRA 62
Minimum and Maximum Percentage of Species per Range Site (Four Species Minimum)

Species	PLS lbs per acre for a full seeding	Number of seeds per PLS Pound	Number of seeds per sq. ft. at 1 PLS lb per ac.	MP, SH, Sw, Sv	Cy, Si, TU	HCOv, HCS, HCSw	Lov, Sb
GRASSES							
Big bluestem	6.6	165,000	3.8	0-15	0-15		10-20
Blue grama	1.3	825,000	18.9	0-20	0-20		
Bluegrass, Canby or Sandberg	1.2	925,000	21.2			0-50	0-40
Green needlegrass	6.5	168,000	3.9	0-10	10-20	10-30	0-10
Little bluestem	4.2	260,000	6.0	10-20	0-20		
Mountain brome	12.1	90,000	2.1			0-20	
Prairie sandreed	4.0	273,000	6.3	0-15			0-20
Slender wheatgrass	6.8	159,000	3.7			10-50 ^{3/}	
Sideoats grama	5.7	191,000	4.4	10-20	10-20		
Switchgrass	2.8	389,000	8.9				10-20
Thickspike wheatgrass	7.1	154,000	3.5			10-50 ^{3/}	
Virginia wildrye	11.3	96,000	2.2		0-10		
Western wheatgrass ^{2/}	9.9	110,000	2.5	10-20	10-20		0-10
FORBS^{1/}							
Black samson	9.5	115,000	2.6	0-5	0-5	0-5	
Canada milkvetch	4.1	266,000	6.1	0-5	0-5	0-5	0-5
Dotted gayfeather	8.0	136,000	3.1	0-5	0-5	0-5	
Maximilian sunflower	4.4	250,000	5.7				0-5
Prairie coneflower	1.5	737,000	16.9	0-5	0-5	0-5	
Purple prairieclover	3.8	290,000	6.7	0-5	0-5	0-5	
Stiff sunflower	12.8	85,000	2.0				0-5
Western yarrow	0.4	2,800,000	64.3	0-5	0-5	0-5	0-5
White prairieclover	2.8	384,000	8.8	0-5	0-5	0-5	
SHRUBS^{1/}							
Leadplant	6.8	161,000	3.7	0-5			
Western snowberry	16.8	65,000	1.5				0-5
Silver buffaloberry	24.2	45,000	1.0	0-5	0-5	0-5	0-5
Golden current	3.1	356,200	8.2		0-5		0-5
Chokecherry	226.9	4,800	0.1		0-5		0-5
Serviceberry	24.2	45,000	1.0		0-5		0-5
Redosier dogwood	6.3	173,000	4.0				0-5

^{1/} The maximum percentage that forbs and shrubs can make of a seeding is 10 percent.

^{2/} Thickspike or slender wheatgrass may be substituted if western wheatgrass is unavailable.

^{3/} Thickspike or slender wheatgrass can be used separately or in combination on these sites. Total maximum percentage that these species can make of the seeding either separately or in combination is 50 percent.

**TABLE 2. ALLOWABLE VARIETIES FOR SOUTH DAKOTA
RANGE PLANTING**

WARM SEASON GRASSES

Alkali Sacaton
common*

Big Bluestem
common*
Bison
Bonilla
Champ
Pawnee
Sunnview

Blue grama
common*
Bad River
Willis

Indiangrass
common*
Holt
Tomahawk

Little Bluestem
common*
Badlands
Blaze
Camper

Nuttal Alkaligrass
common*

Prairie Cordgrass
common*
Red River

Prairie Dropseed
common*

Prairie Sandreed
common*
Goshen
Pronghorn

Sand Bluestem
common*
Garden
Goldstrike

Sideoats Grama
common*
Butte
Killdeer
Pierre
Trailwav

Switchgrass
common*
Dacotah
Forestburg
Nebraska-28
Pathfinder
Summer
Sunburst
Trailblazer

COOL SEASON GRASSES

American Sloughgrass
common*

Canby Bluegrass
common*

Canada Wildrve
common*
Mandan

Green Needlegrass
common*
Lodorm

Mountain Brome
common*
Bromar

Needleandthread
common*

Porcupinegrass
common*

Reed Canarvgrass
common*
Frontier
Ioreed
Palaton
Rise
Vantage
Venture

Sandberg Bluegrass
common*

Slender Wheatgrass
common*
Prvor
Revenue
Adanac
Primar

Slough Sedge
common*

Thickspike Wheatgrass**
common*
Critana
Elbee

Virginia Wildrve
common*
Omaha

Western Wheatgrass
common*
Flintlock
Rodan
Rosana

Whitetop
common*

FORBS AND SHRUBS

Canada Milkvetch
common*
Sunrise

Other Forbs and Shrubs
Common*

* The origin of non-varietal 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.

**Thickspike wheatgrass may be substituted for western wheatgrass when the later is not available and only west of the Missouri River