

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE INSTALLATION GUIDELINES

## CONSERVATION COVER

(ac.)  
CODE 327

Installation guidance for this practice is found in **South Dakota Range Technical Note No. 4, "Perennial Vegetation Establishment,"** located in Section I of the South Dakota Technical Guide. It contains specific guidance on seeding dates, rates and depth, seedbed preparation, seeding equipment and calibration, seed requirements, species selection, use of cover and companion crops, management and protection during the establishment period, and stand evaluations.

Tables contained in the Technical Note contain specific information to be used in the installation of this practice as follows:

Table 1 lists the allowable varieties for use in South Dakota.

Table 3 provides information on species characteristics and adaptability.

### ESTABLISHMENT OF PERMANENT INTRODUCED GRASSES AND LEGUMES

A minimum of two introduced grass species must be seeded; however, establishing four or more species will enhance biological diversity, wildlife habitat, and other ecosystem functions. If two or three species are seeded, they may all be introduced grasses. If four or more species are seeded, the mixture will include at least three introduced grasses and at least one forb or legume species. Table 1 contains recommended species mixes for establishing permanent introduced grasses. The mixes reflect a predetermined percentage for each species and will be used as is. Native grass species are included in some of the mixes to provide greater diversity and improved wildlife habitat.

### ESTABLISHMENT OF PERMANENT NATIVE GRASSES

A minimum of three species must be seeded; however, establishing five or more species will enhance biological diversity, wildlife habitat, and other ecosystem functions. If three species are selected, at least two must be native grass species and at least one must be a forb or legume species. When five species are selected, a minimum of three native grasses and at least one native shrub, forb, or introduced or native legume will be planted. Table 2A provides seed mixtures for both three and five species mixes. They reflect a predetermined percentage for each species and will be used as is. Tables 2B and 2C contain recommended species and seeding rates based on ecological sites and Major Land Resource Areas (MLRA). Select the proper Table 2B or 2C for the specific MLRA where the field exists. Seeding rates listed in Tables 2B and 2C are full rates for each species and will be multiplied by the percentage the species will make up of the mixture to obtain the seeding rate. The percentages listed for each species by ecological site represent the maximum percentages that each species may make up of the seeding.

When two or more ecological sites are planned to be seeded with the same mixture all species selected will be adapted to the sites present within the field. All ecological sites that occupy more than five percent of the area to be seeded should be considered in the design of the seeding mix. Selected species should have a reasonable chance of surviving across all ecological sites. Species with a narrow range of environmental adaptability (i.e., species adapted to wet sites) will not be used across seedings containing ecological sites with diverse site characteristics (i.e., wet to dry). The percentage that each species makes of the mixture when added together will equal 100 percent.

An alternative to designing a single seeding mixture for multiple sites is to design and apply a unique seeding mixture for each ecological site occurring in the area to be seeded. This method is recommended when existing sites have very diverse characteristics (i.e., wet vs. dry sites). The logistics of identifying the sites in the field, changing seed mixtures in the drill, and making certain all areas are seeded will be considered prior to selecting this method.

**ESTABLISHMENT OF PERMANENT WILDLIFE HABITAT**

A minimum of four species will be seeded. If four species are seeded, species selection will be a mixed stand of grasses, shrubs, forbs, or legumes planted in mixes best suited for wildlife species in the area. If five or more species are planted, species selection will be predominantly native species including grasses, forbs, legumes, and shrubs planted in mixes best suited to providing wildlife habitat. Only native grass species are allowed. Table 3 contains recommended species mixes for the establishment of introduced and native species best suited for permanent wildlife habitat. Mixes may also be developed using Tables 2B and 2C as long as the above criteria are met. Seeding rates for the mixes found in Table 3, reflect a pre-determined percentage each species will make of the mix and will be used as is. A wildlife conservation plan must be developed to identify wildlife habitats to be established through this standard.

Small clump plantings of bare root shrubs are allowed. If bare root shrubs are established they **will not** be considered to contribute one species toward the four or five species requirement detailed above. The minimum size shrub planting is one-tenth acre. The total area established to shrubs will not exceed one percent of the total area to be seeded. Allowable shrub species are:

American plum	Black chokeberry	Skunkbush sumac
Silver buffaloberry	American cranberrybush	Nannyberry
Redosier dogwood	Golden currant	Sandbar willow
Leadplant	False indigo	Juneberry
Common chokecherry	Silverberry	Western sandcherry

Shrub species will be adapted to the site. For additional information on the adaptability of shrub species see “Woodland Technical Note No. 37, Tree and Shrub Characteristics.”

Shrubs may also be established by seed as part of a mixture Tables 2B and 2C. If shrubs are established by seed, they **will** be considered to contribute one species (even if multiple species are selected), to the four or five species requirement specified above (at least three or four grass or forb species will also be required). Tables 2B and 2C contain seeding rates for common shrubs that may be established by seed.

**ESTABLISHMENT OF UPLAND HABITAT DURING WETLAND RESTORATIONS**

Table 4 contains recommended species mixes of introduced and native species best suited for the establishment of permanent vegetation on the upland portion of a wetland restoration. Seeding rates for these mixes reflect a pre-determined percentage each species will make of the mix and should be used as is. Although as little as a single species will meet specifications, establishing a minimum of four species will enhance biological diversity, wildlife habitat, and other ecosystem functions.

**FERTILIZATION**

In most instances, fertilization has not proven beneficial, and may in fact be detrimental to seedling establishment due to increased weed growth caused by the addition of nutrients. Fertilization prior to seeding is generally not recommended.

**STAND MAINTENANCE**

Management of established stands is required to maintain plant diversity, enhance wildlife benefits, and protect soil and water resources. All management activities, with the exception of prescribed burning must be conducted outside the primary nesting season that is defined as May

1<sup>st</sup> August 1<sup>st</sup>. Prescribed burning may be conducted until May 15<sup>th</sup> if required to ensure a timely and successful burn. Management practices may be completed over a two-year period.

The following management activities are allowed:

**Light Disking** – No more than 30 percent of the soil should be exposed. Till no deeper than three inches. Do not use on fields with a high risk of weed infestation or those being impacted by drought. Complete this practice between August 1<sup>st</sup> and September 1<sup>st</sup>.

**Harrowing** – No more than 30 percent of the soil should be exposed. Complete this practice between August 1<sup>st</sup> and September 1<sup>st</sup>.

**Prescribed Burning** – This practice can only be done under an approved burn plan prepared by a qualified person. See conservation practice Prescribed Burning (338) for additional details. Complete this practice between March 1<sup>st</sup> and May 15<sup>th</sup>.

**Clipping or Mowing** – Mow to a normal hay cutting height. Any removal of residues must be in compliance with regulatory requirements. Complete this practice between August 1<sup>st</sup> and September 1<sup>st</sup>.

No management activities will be conducted later than September 1<sup>st</sup> or earlier than March 1<sup>st</sup> in order to allow for re-growth before the end of the growing season and to provide adequate winter cover.

Management of cover is required once during 10-year periods and twice during 15-year periods. The first management activity must be completed by the 8<sup>th</sup> year and the second, if required, by the 13<sup>th</sup> year. Because of the importance of residual cover for nesting birds, management will not be allowed more frequently than listed above. Any other unscheduled activities that result from emergency use or other such activities will negate the need for scheduled management.

**Table 1. Establishment of Permanent Introduced Grasses and Legumes**

SPECIES	Eastern	Western	Suitable for Pasture Groups
	MLRA's <sup>1/</sup>	MLRA's <sup>2/</sup>	
	PLS LBS	PLS LBS	
Tall wheatgrass	4.1	3.3	A, C, D1, E, F, G, H, I, J, K
Western wheatgrass**	7.0	5.6	
Tall wheatgrass	4.1	3.3	A, C, D1, E, F, G, H, I, K
Western wheatgrass**	4.0	3.2	
Alfalfa	2.0	1.7	
Tall wheatgrass	4.1	3.3	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	4.0	3.4	
Alfalfa	2.0	1.7	
Western wheatgrass**	4.0	3.2	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	3.0	2.6	
Alfalfa	2.0	1.7	
Switchgrass	1.8	1.4	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	3.0	2.6	
Alfalfa	2.0	1.7	
Tall Wheatgrass	2.7	2.2	A, C, D1, E, F, G, H, I, K
Western wheatgrass**	2.0	1.6	
Intermediate wheatgrass*	3.0	2.6	
Alfalfa	2.0	1.7	
Slender wheatgrass	1.1	1.0	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass	3.0	2.6	
Western wheatgrass	2.0	1.6	
Alfalfa	2.0	1.7	
Big bluestem	3.0	2.4	A, C, D1, E, F, G, H, I, K
Tall Wheatgrass	2.7	2.2	
Intermediate Wheatgrass	2.0	1.7	
Alfalfa	1.3	1.1	
Switchgrass	1.8	1.4	A, C, D1, E, F, G, H, I, K
Tall Wheatgrass	2.7	2.2	
Intermediate Wheatgrass	2.0	1.7	
Alfalfa	1.3	1.1	

\* Pubescent wheatgrass may be substituted for Intermediate wheatgrass at any time.

\*\* Thickspike wheatgrass may be substituted for western wheatgrass if the later is not available and only west of the Missouri River. To obtain a seeding rate for thickspike wheatgrass multiply the western wheatgrass seeding rate by .72

<sup>1/</sup> MLRA's 102A, 102B, 53B, 53C, 55B, 55C, 63B, 66

<sup>2/</sup> MLRA's 54, 58D, 60A, 61, 62, 63A, 64

**Table 2A. Establishment of Permanent Native Grasses****THREE AND FIVE SPECIES MIXES**

<b>SPECIES</b>	<b>Eastern</b>	<b>Western</b>	<b>Suitable for the Following Range Sites</b>
	<b>MLRA's <sup>1/</sup></b>	<b>MLRA's <sup>2/</sup></b>	
	<b>PLS LBS</b>	<b>PLS LBS</b>	
Switchgrass	1.4	1.1	LSb, SSb, Cov, Lov, Sb, Cy, Si, Sy, LT
Green needlegrass	3.0	2.4	
Alfalfa	2.0	1.7	
Western wheatgrass <sup>3/</sup>	4.0	3.2	LSb, SSb, Cov, Lov, Sb, Cy, Si, Sy, LT,
Green needlegrass	2.3	1.8	Cp, TCp, Sa, VSw, SwG, Sw, SwC, TU
Alfalfa	2.0	1.7	
Western wheatgrass <sup>3/</sup>	2.0	1.6	LSb, SSb, Cov, Lov, Sb, Cy, Si, Sy, LT,
Green needlegrass	1.5	1.2	Cp, TCp, Sa, VSw, SwG, Sw, SwC, TU
Sideoats grama	1.5	1.2	
Big Bluestem	1.5	1.2	
Alfalfa	1.3	1.1	
Big bluestem	1.5	1.2	LSb, SSb, Cov, Lov, Sb, Cy, Si, Sy, LT
Little bluestem	0.9	0.8	
Switchgrass	0.9	0.7	
Western Wheatgrass	2.0	1.6	
Alfalfa	1.3	1.1	
Big bluestem	1.5		LSb, SSb, Cov, Lov, Sb, Cy, Si, Sy, LT
Indiangrass	1.4		
Switchgrass	0.9		
Western Wheatgrass	2.0		
Alfalfa	1.3		

**THREE SPECIES** - Mixed stand (minimum of three species total ) of at least two native grasses and at least one forb, or legume species beneficial to wildlife. Utilize Table 2B or 2C to design a seeding which meets these criteria as well as meeting the participants wildlife objectives.

**FIVE OR MORE SPECIES** - Mixed stand (minimum of five species total) of at least three native grasses and at least one shrub, forb, or legume species best suited for wildlife in the area. Utilize Table 2B or 2C to design a seeding which meets these criteria as well as meeting the participants wildlife objectives.

<sup>1/</sup> MLRA's 102A, 102B, 53B, 53C, 55B, 55C, 63B, 66

<sup>2/</sup> MLRA's 54, 58D, 60A, 61, 62, 63A, 64

<sup>3/</sup> Thickspike wheatgrass may be substituted for western wheatgrass if the later is not available and only in the western MLRA's. To obtain a seeding rate for thickspike wheatgrass multiply the western wheatgrass seeding rate by .72

**Table 2B. Establishment of Permanent Native Grasses**  
**Eastern Major Land Resource Areas (MLRA)**

MLRA's 102A, 102B, 53B, 53C, 55B, 55C, 63B, 66

Maximum Percentage of Species per Ecological Site 1/

GRASSES 2/	Seeding Rate PLS/LBS	LSb, SSb, COv, LOv, Sb	SM, WL, WM 4/	Cy, Si	Cp, TCp	Sa, Sy	VSw, SwG	Sw, SwC, TU	SL 5/	DC 5/	CD 5/
Alkali sacaton	1.2								30		
Big bluestem	7.5	60		25		20	10	25			
Blue grama	2.5			10	40	20	25	25			
Canada wildrye	7.5	20		10							
Green needlegrass	7.5	25		50	40		15	30		40	
Indiangrass	7.0	30		20		20		10			
Little bluestem	4.5	25		30	25	30	25	40			
Nuttall alkaligrass	1.0								30		
Prairie sandreed	5.0			10	20	30	10				
Sand bluestem	12.0					30					
Sideoats grama	7.5	20		25	20	20	25	30		20	
Switchgrass	4.5	30		20	25	20		10	50		
Western Wheatgrass	10.0	25		40	60	20	40	30	80	70	100

**NATIVE FORBS & LEGUMES 3/**

Canada milkvetch	4.0	10		10	10	10	10	10			
Illinois Bundleflower	18.0	10		10	10	10	10	10			
Prairie coneflower	1.5			10	10	10	10	10			
Purple coneflower (Black Samson)	9.0			10		10	10	10			
Dotted gayfeather	8.0	10		10	10	10	10	10			
Purple prairieclover	3.8	10		10	10	10	10	10			
White prairieclover	3.9	10		10	10	10	10	10			
Maximilian sunflower	1.0	10		10	10	10					
Western yarrow	0.4	10		10	10	10					

**NATIVE SHRUBS 3/**

Buffaloberry	4.2	10		10		10					
Chokecherry	26.0	10		10		10					
Currant	5.5	10		10		10					
False indigo	25.0	10									
Juneberry	16.0	10		10		10					
Leadplant	6.5	10		10		10	10	10			
Prairie rose	29.0	10		10		10	10	10			
Western snowberry	17.5	10		10		10					

**INTRODUCED LEGUMES 3/**

Alfalfa	6.5	30		30	30	30					
Alsike clover	3.0	30		30	30	30					
Birdsfoot trefoil	5.0	30		30	30	30					
Red clover	5.0	30		30	30	30					

- 1/ - Each species or species type (native forbs and legumes etc.) selected must make up at least 10 percent of the seeding mix
- 2/ - Grasses must make up a minimum of 70% of the seeding
- 3/ - Native forbs and shrubs along with introduced legumes either separately or in combination cannot make up more than 30% of the mixture
- 4/ - Due to poor seed availability seeding of these sites is limited to introduced or single species plantings.
- 5/ - Site conditions limit the availability of species making it difficult to establish legumes, forbs or more than single grass species.

**Table 2C. Establishment of Permanent Native Grasses**  
**Western Major Land Resource Areas (MLRA)**

MLRA's 54, 58D, 60A, 61, 62, 63A, 64

Maximum Percentage of Species per Ecological Site 1/

GRASSES 2/	Seeding Rate PLS/LBS	Bov, Cov, LOv, Sb	Cy, LT, Si	Cp, TCp	Csa, Sa, Sy	VSw, SwG	Sw, SwC, TU	SL 5/	DC, SDC 5/	CD 5/
Alkali sacaton	1.2							30		
Big bluestem	6.0	50	20		30		20			
Blue grama	2.0	10	20	30	20	30	30	20		
Canada wildrye	6.5	10								
Green needlegrass	6.0	50	50	30		15	25		40	
Little bluestem	4.0	25	25	10	40	30	60			
Nuttall alkaligrass	1.0			20				30		
Prairie sandreed	4.0	20	20	20	40	20	20			
Sand bluestem	9.5				30					
Sideoats grama	6.0	20	30	20	20	30	40		20	
Switchgrass	3.5	30	25		20			20		
Western Wheatgrass 4/	8.0	60	60	60	20	20	50	80	80	100

NATIVE FORBS & LEGUMES 3/										
Canada milkvetch	4.0	10		10	10	10	10	10		
Illinois Bundleflower	18.0	10	10	10	10	10	10			
Prairie coneflower	1.5		10	10	10	10	10			
Purple coneflower (Black Samson)	9.0		10		10	10	10			
Dotted gayfeather	8.0	10	10	10	10	10	10			
Purple prairieclover	3.8	10	10	10	10	10	10			
White prairieclover	3.9	10	10	10	10	10	10			
Maximilian sunflower	1.0	10	10	10	10					
Western yarrow	0.4	10	10	10	10					

NATIVE SHRUBS 3/										
Buffaloberry	4.2	10	10		10					
Chokecherry	26.0	10	10		10					
Currant	4.5	10	10		10					
False indigo	21.0	10								
Juneberry	13.0	10	10		10					
Leadplant	5.4	10	10		10	10	10			
Prairie rose	24.0	10	10		10	10	10			
Western snowberry	14.6	10	10		10					

INTRODUCED LEGUMES 3/										
Alfalfa	5.5	30	30	30	30					
Alsike clover	3.0	30	30	30	30					
Cicer Milkvetch	8.0	30	30	30	30					
Sainfoin	5.0	30	30	30	30					
Small burnet	0.9	30	30	30	30					

1/ - Each species or species type (native forbs and legumes etc.) selected must make up at least 10 percent of the seeding mix

2/ - Grasses must make up a minimum of 70% of the seeding

3/ - Native forbs and shrubs along with introduced legumes either separately or in combination cannot make up more than 30% of the mixture

4/ - Thickspike wheatgrass may be substituted for western wheatgrass

5/ - Site conditions limit the availability of species making it difficult to establish legumes, forbs or more than single grass species.

**Table 3. Establishment of Introduced and Native Seeding Mixes Best Suited for Permanent Wildlife Habitat**

SPECIES	Eastern	Western	Suitable for Pasture Groups
	MLRA's 1/	MLRA's 2/	
	PLS LBS	PLS LBS	
Tall wheatgrass	4.1	3.3	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	4.0	3.4	
Alfalfa	1.3	1.1	
Sweetclover	0.4	0.3	
Western wheatgrass	3.0	2.4	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	4.0	3.4	
Alfalfa	1.3	1.1	
Sweetclover	0.4	0.3	
Switchgrass	1.8	1.4	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	3.0	2.6	
Alfalfa	1.3	1.1	
Sweetclover	0.4	0.3	
Western wheatgrass	2.0	1.6	A, C, D1, D2, E, F, G, H, I, K
Green needlegrass	1.5	1.2	
Sideoats grama	3.0	2.4	
Alfalfa	1.3	1.1	
Big bluestem	1.5		A, C, D1, D2, E, F, G, H, I, K
Indiangrass	1.4		
Switchgrass	0.9		
Western wheatgrass	2.0		
Alfalfa	1.3		
Big bluestem	1.5		A, C, D1, D2, E, F, G, H, I, K
Indiangrass	1.4		
Switchgrass	0.9		
Green needlegrass	1.5		
Alfalfa	1.3		
Big bluestem	1.5	1.2	A, C, D1, D2, E, F, G, H, I, K
Little bluestem	0.9	0.8	
Switchgrass	0.9	0.7	
Green needlegrass	1.5	1.2	
Alfalfa	1.3	1.1	
Big bluestem	1.5		A, C, D1, D2, E, F, G, H, I, K
Little bluestem	0.9		
Indiangrass	1.1		
Sideoats grama	1.1		
Alfalfa	2.0		
Western wheatgrass	2.0	1.6	A, C, D1, D2, E, F, G, H, I, K
Green needlegrass	1.5	1.2	
Sideoats grama	1.5	1.2	
Little bluestem	0.9	0.8	
Alfalfa	1.3	1.1	
Western wheatgrass	2.0	1.6	A, C, D1, D2, E, F, G, H, I, K
Green needlegrass	1.5	1.2	
Big bluestem	1.5	1.2	
Little bluestem	0.9	0.8	
Alfalfa	1.3	1.1	

**FIVE OR MORE SPECIES** - Mixed stand (minimum of five species total) of either predominately native species including grasses, forbs, legumes, shrubs, or trees planted in mixes, blocks, or strips best suited to providing wildlife habitat. **Only native grasses will be used.** Utilize Tables 2B or 2C to design a seeding which meets these criteria as well as meeting the participants wildlife objectives

\* Pubescent wheatgrass may be substituted for Intermediate wheatgrass at any time.

<sup>1/</sup> MLRA's 102A, 102B, 53B, 53C, 55B, 55C, 63B, 66

<sup>2/</sup> MLRA's 54, 58D, 60A, 61, 62, 63A, 64

**Table 4. Establishment of Introduced and Native Seeding Mixes Best Suited for Establishing Permanent Vegetation on the Upland Portions of a Wetland Restoration**

SPECIES	Eastern	Western	Suitable for Pasture Groups
	MLRA's <sup>1/</sup>	MLRA's <sup>2/</sup>	
	PLS LBS	PLS LBS	
Tall wheatgrass	5.4	4.4	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	2.0	1.7	
Alfalfa	2.0	1.7	
Sweetclover	0.4	0.3	
Tall wheatgrass	2.7	2.2	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	4.0	3.4	
Alfalfa	2.0	1.7	
Sweetclover	0.4	0.3	
Western wheatgrass	4.0	3.2	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	2.0	1.7	
Alfalfa	2.0	1.7	
Sweetclover	0.4	0.3	
Western wheatgrass	2.0	1.6	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	4.0	3.4	
Alfalfa	2.0	1.7	
Sweetclover	0.4	0.3	
Switchgrass	1.8	1.4	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	1.6	1.7	
Alfalfa	2.0	1.7	
Sweetclover	0.4	0.3	
Switchgrass	0.9	0.7	A, C, D1, E, F, G, H, I, K
Intermediate wheatgrass*	3.2	3.4	
Alfalfa	2.0	1.7	
Sweetclover	0.4	0.3	
Western wheatgrass	2.0	1.6	A, C, D1, D2, E, F, G, H, I, K
Green needlegrass	1.5	1.2	
Sideoats grama	3.0	2.4	
Alfalfa	1.3	1.1	
Big bluestem	1.5		A, C, D1, D2, E, F, G, H, I, K
Indiangrass	1.4		
Switchgrass	1.4		
Alfalfa	2.0		
Big bluestem	1.5		A, C, D1, D2, E, F, G, H, I, K
Indiangrass	1.4		
Switchgrass	1.4		
Green needlegrass	2.3		
Big bluestem	1.5	1.2	A, C, D1, D2, E, F, G, H, I, K
Little bluestem	0.9	0.8	
Switchgrass	1.4	1.1	
Green needlegrass	2.3	1.8	
Big bluestem	1.9		A, C, D1, D2, E, F, G, H, I, K
Little bluestem	1.1		
Indiangrass	1.8		
Sideoats grama	1.9		
Western wheatgrass	2.5	2.0	A, C, D1, D2, E, F, G, H, I, K
Green needlegrass	1.9	1.5	
Sideoats grama	1.9	1.5	
Little bluestem	1.1	1.0	

\* Pubescent wheatgrass may be substituted for Intermediate wheatgrass at any time.

<sup>1/</sup> MLRA's 102A, 102B, 53B, 53C, 55B, 55C

<sup>2/</sup> MLRA's 54, 58D, 60A, 61, 62, 63A, 63B, 64