

## DESIGN AND INSTALLATION GUIDE

### Range Planting - 550

Range Planting shall be planned and applied in accordance with the standard detailed in Section IV of the Field Office Technical Guide. This document provides additional parameters, recommendations, references, and requirements for developing site-specific plans for this practice.

**1. Refer to Herbaceous Vegetation Establishment Guide (FOTG, Section I-Reference Subjects- Plant Materials Subsection) for:**

- Seeding dates (Part 1)
- Seedbed preparation (Part 2)
- Seeding equipment (Part 3)
- Drill Calibration (Part 4)
- Seed requirements (Part 5)
- Seeding depth (Part 6)
- Cover and companion crops (Part 7)
- Management and protection during establishment (Part 8)
- Procedure for stand evaluation (Part 9)

**2. Selecting Species and Varieties**

- a. Determine the Ecological Site based on soils, from Section II-E of the Field Office Technical Guide.
- b. Refer to Table 1 of this guide for recommended species and percent minimums and maximums for the Ecological Site(s).
- c. Refer to Herbaceous Vegetation Establishment Guide for approved named varieties and full seeding rates of native grasses, forbs and shrubs. Use named varieties when available.

**3. Planning Considerations**

- a. Where water erosion is a concern, all tillage and seeding operations should be performed across the general slope of the fields where appropriate. When seeding into light textured soils, adequate cover is required to prevent excessive erosion.
- b. For improved germination, scarification of legumes with hard seed coats is recommended. Scarification is especially important with the following species: purple prairie clover, white prairie clover, leadplant and Canada milkvetch.
- c. Slender wheatgrass and Canada Wildrye are short-lived species, but establish rapidly and provide quick cover.

**4. Guidelines for stand evaluation**

- a. Stand must have a minimum density of two rhizomatous grass plants per square foot, or four plants per square foot for bunchgrasses or mixtures of bunch and rhizomatous type grasses; or in the case of grass/legume/forb mixtures, two grass plants and one legume or forb plant per square foot.
- b. See Part 9 of Herbaceous Vegetation Establishment Guide for additional guidance on stand evaluation.

**5. Established stand management**

- a. Refer to Practice 528A, Prescribed Grazing, for management after establishment.

**6. Documentation**

- a. Use ND-CPA-9 (electronic or hardcopy) to document practice planning and installation.

**TABLE 1. Ecological (Range) Site Recommended Species for MLRA 53 A&B**  
Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, all Seeding Mixtures must equal 100%)

Species	Ecological Sites														
	Wet Land and Wet Meadow	Subirrigated	Limy Subirrigated	Loamy Overflow	Saline Lowland	Closed Depression 1/	Sandy	Sands	Thin Sands	Clayey	Loamy	Thin Loamy	Claypan and Thin Claypan	Shallow Gravel and Very Shallow	Sandy Claypan
<b>Grasses: 2/</b>															
American sloughgrass	5-10														
Beardless wildrye					5-30										
Big bluestem		5-40	5-40	5-40			5-10				5-20				
Bluebunch wheatgrass												5-10		5-10	
Blue grama		5-10	5-10	5-10			5-10	5-10	5-20	5-10	5-10	5-10	5-20	5-20	5-10
Canada wildrye	5-10	5-10	5-10	5-10	5-10		5-10	5-20	5-20		5-10	5-10		5-10	5-20
Green needlegrass		5-20	5-10	5-30			5-30	5-10		5-40	5-30	5-20	5-20	5-10	5-20
Indiangrass		5-10	5-10	5-10							5-10				
Little bluestem		5-15	5-35	5-10			5-10	5-20	5-30			5-40	5-10	5-40	5-20
Needle and Thread				5-10			5-10	5-20	5-20	5-10	5-10	5-10	5-20	5-20	5-20
Nuttall alkaligrass					5-30	5-20									
Porcupinegrass		5-10	5-10	5-10			5-10	5-10		5-10	5-10	5-10			
Prairie cordgrass	5-60	5-10	5-10		5-20	5-10									
Prairie dropseed			5-10	5-10											
Prairie junegrass		5-10	5-10	5-10			5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10
Prairie sandreed							5-25	5-40	5-40			5-10		5-10	5-30
Reed canarygrass	5-10														
Sand bluestem							5-20	5-40	5-40					5-10	5-20
Sand dropseed							5-10	5-10	5-10					5-10	5-10
Sideoats grama		5-10	5-15	5-20			5-10	5-20	5-20	5-20	5-30	5-30	5-10	5-30	5-20
Slender wheatgrass		5-10	5-10	5-10	5-20	5-20	5-10			5-10	5-10	5-10	5-20	5-20	5-20
Switchgrass	5-40	5-20	5-20	5-10	5-20		5-10			5-10	5-10		5-10		
Western wheatgrass	5-40	5-20	5-20	5-20	5-50	5-90	5-30	5-20	5-10	5-30	5-30	5-20	5-50	5-20	5-35

1/ On this site a minimum of three species must be planted.  
2/ Minimum of four grasses, at least one warm and/or cool season species.  
3/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in #4, individual forb and shrub species will be limited to 4% of the mixture.  
4/ These species will be limited to no more than 2% of the mixture.

**TABLE 1. Ecological (Range) Site Recommended Species for MLRA 53 A&B - continued**  
Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, all Seeding Mixtures must equal 100%)

Species	Wet Land and Wet Meadow	Subirrigated	Limy Subirrigated	Loamy Overflow	Saline Lowland	Ecological Sites							Shallow Gravel and Very Shallow	Sandy Claypan	
						Closed Depression 1/	Sandy	Sands	Thin Sands	Clayey	Loamy	Thin Loamy			Claypan and Thin Claypan
<b>Forbs 3/</b>															
Black-eyed susan 4/	*	*	*	*			*	*	*	*	*	*	*	*	*
Blanketflower							*			*	*	*	*	*	*
Canada milkvetch		*	*	*			*	*	*	*	*		*		
Cudweed sagewort 4/				*			*	*	*		*		*		
Cup plant	*	*		*											
Dotted gayfeather							*	*	*	*	*	*	*	*	
Fragrant giant hyssop				*			*			*	*				
Illinois bundleflower	*	*		*			*			*	*				
Lewis flax		*	*				*	*		*	*	*			
Maximillian sunflower	*	*	*	*			*	*		*	*				
New England aster	*	*		*											
Plains Coreopsis		*	*	*			*			*	*				
Prairie coneflower 4/							*	*	*	*	*	*	*	*	*
Purple coneflower								*	*	*	*	*	*	*	*
Purple prairieclover				*			*	*	*	*	*	*	*	*	*
Shell-leaf penstemon							*	*	*						
Stiff sunflower 4/	*	*	*	*			*	*	*	*	*	*	*	*	*
Western yarrow 4/		*	*	*	*	*	*	*	*	*	*	*	*	*	*
White prairieclover		*	*	*			*			*	*	*	*	*	
Wild bergamont	*	*		*			*				*				
<b>Shrubs 3/</b>															
Leadplant				*			*	*	*	*	*	*		*	*
Prairie rose		*	*				*	*	*	*	*	*	*	*	*
Western snowberry		*	*	*			*	*		*	*	*		*	
2/ Minimum of four grasses, at least one warm and/or cool season species.															
3/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in #4, individual forb and shrub species will be limited to 4% of the mixture.															
4/ These species will be limited to no more than 2% of the mixture.															

**TABLE 1. Ecological (Range) Site Recommended Species for MLRA 55A, 55B & 56**  
Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, All Seeding Mixtures will equal 100%)

Species	Ecological Sites														
	Wet Land and Wet Meadow	Subirrigated	Limy Subirrigated	Loamy Overflow	Saline Lowland	Sandy	Sands	Thin Sands	Clayey	Loamy	Thin Loamy	Claypan and Thin Claypan	Shallow Gravel and Very Shallow	Subirrigated Sands	Sandy Claypan
<b>Grasses 1/</b>															
American sloughgrass	5-10														
Beardless wildrye					5-40										
Big bluestem		5-50	5-40	5-40		5-20				5-20				5-30	
Blue grama			5-10	5-10		5-10	5-10	5-20	5-10	5-10	5-10	5-20	5-20	5-10	5-10
Canada wildrye	5-10	5-10	5-10	5-10	5-10	5-10	5-20	5-20		5-10	5-10			5-20	5-20
Green needlegrass		5-10	5-10	5-20		5-30	5-10		5-40	5-40	5-20	5-20	5-10	5-10	5-20
Indiangrass		5-25	5-20	5-20						5-10					
Little bluestem		5-25	5-40	5-20		5-20	5-20	5-30			5-40	5-10	5-40		5-20
Needle and Thread				5-10		5-10	5-20	5-20	5-10	5-10	5-10	5-20	5-20	5-20	5-20
Nuttall alkaligrass					5-20										
Porcupinegrass			5-10	5-10		5-20	5-10		5-10	5-10	5-10			5-10	
Prairie cordgrass	5-60	5-25	5-10	5-10	5-20										
Prairie dropseed				5-10											
Prairie junegrass						5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10
Prairie sandreed						5-20	5-40	5-40			5-10		5-10	5-30	5-30
Reed canarygrass	5-10														
Sand bluestem						5-20	5-40	5-40					5-10	5-10	5-20
Sand dropseed						5-10	5-10	5-10					5-10		5-10
Sideoats grama		5-20	5-20	5-20		5-10	5-20	5-20	5-20	5-30	5-30	5-10	5-20	5-20	5-20
Slender wheatgrass		5-10	5-10	5-10	5-20	5-10			5-10	5-10	5-10	5-20	5-20		5-20
Switchgrass	5-40	5-25	5-20	5-20	5-20	5-10			5-20	5-10		5-10		5-10	
Western wheatgrass	5-40	5-25	5-20	5-20	5-50	5-30	5-10	5-10	5-30	5-30	5-20	5-50	5-20	5-20	5-35
Whitetop 2/	5-30*														

1/ Minimum of four grasses, at least one warm and/or cool season species.

2/ This species can only be seeded in Wetland sites

3/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in #4, individual forb and shrub species will be limited to 4% of the mixture.

4/ These species will be limited to no more than 2% of the mixture.

TABLE 1. Ecological (Range) Site Recommended Species for MLRA 55A, 55B & 56 - continued															
Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, All Seeding Mixtures will equal 100%)															
Species	Wet Land and Wet Meadow	Subirrigated	Limy Subirrigated	Loamy Overflow	Ecological Sites								Shallow Gravel and Very Shallow	Subirrigated Sands	Sandy Claypan
					Saline Lowland	Sandy	Sands	Thin Sands	Clayey	Loamy	Thin Loamy	Claypan and Thin Claypan			
<b>Forbs 3/</b>															
Black-eyed susan 4/	*	*	*	*		*	*	*	*	*	*	*	*	*	*
Blanketflower						*				*	*	*	*		*
Canada milkvetch		*	*	*		*	*	*	*	*		*			
Cudweed sagewort 4/				*		*	*	*		*		*		*	
Cup plant	*	*		*											
Dotted gayfeather						*	*	*	*	*	*	*	*		
Fragrant giant hyssop				*		*			*	*					
Illinois bundleflower	*	*		*		*			*	*					
Lewis flax		*	*	*		*	*		*	*	*			*	
Maximilian sunflower	*	*	*	*		*	*		*	*		*		*	
New England aster	*	*		*											
Plains Coreopsis	*	*	*	*		*			*	*					
Prairie coneflower 4/						*	*	*	*	*	*	*	*	*	*
Purple coneflower							*	*	*	*	*	*	*	*	*
Purple prairieclover				*		*	*	*	*	*	*	*	*	*	*
Shell-leaf penstemon						*	*	*	*	*	*	*	*	*	*
Stiff sunflower 4/	*	*	*	*		*	*	*	*	*	*	*	*	*	*
Western yarrow 3/		*	*	*	*	*	*	*	*	*	*	*	*	*	*
White prairieclover		*	*	*		*	*	*	*	*	*	*	*	*	*
Wild bergamont	*	*		*		*				*					
<b>Shrubs 3/</b>															
Leadplant				*		*	*	*	*	*	*	*	*	*	*
Prairie rose		*	*			*	*	*	*	*	*	*	*	*	*
Western snowberry		*	*	*		*	*	*	*	*	*	*	*	*	*
1/ Minimum of four grasses, at least one warm and/or cool season species.															
2/ This species can only be seeded in Wetland sites															
3/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in #4, individual forb and shrub species will be limited to 4% of the mixture.															
4/ These species will be limited to no more than 2% of the mixture.															

TABLE 1. **Ecological (Range) Site Recommended Species for MLRA 54 & 58 C&D**

Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, All Seeding Mixtures must equal 100%)

Species	Ecological Sites											
	Wetland and Wet Meadow	Subirrigated	Limy Subirrigated	Loamy Overflow	Loamy Terrace	Sandy Terrace	Clayey Terrace	Saline Lowland	Closed Depression <sup>1/</sup>	Sandy	Sands	Clayey
<b>Grasses 2/</b>												
American sloughgrass	5-10											
Beardless wildrye								5-10				
Big bluestem		5-35	5-35	5-35	5-30	5-10				5-10		
Bluebunch wheatgrass												
Blue grama				5-10	5-10	5-10	5-10			5-10	5-10	5-20
Canada wildrye	5-10	5-10	5-10	5-10	5-10	5-20		5-10		5-10	5-20	
Green needlegrass		5-25	5-10	5-25	5-30	5-20	5-40			5-25		5-40
Indiangrass			5-10	5-10								
Little bluestem		5-10	5-30	5-10		5-10	5-10			5-10	5-20	
Needle and Thread				5-10	5-10	5-10	5-10			5-10	5-20	5-10
Nuttall alkaligrass								5-30	5-20			
Porcupinegrass		5-10	5-10	5-10	5-20	5-10	5-10			5-10		5-10
Prairie cordgrass	5-60	5-10	5-10	5-10				5-20	5-10			
Prairie dropseed			5-10	5-10	5-10							
Prairie junegrass		5-10	5-10	5-10	5-10	5-10	5-10			5-10	5-10	5-10
Prairie sandreed						5-30				5-25	5-40	
Reed canarygrass	5-10											
Sand bluestem						5-30				5-20	5-40	
Sand dropseed						5-10				5-10	5-10	
Sideoats grama			5-10	5-20	5-20	5-10	5-20			5-10	5-20	5-20
Slender wheatgrass	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-20	5-20	5-10		5-10
Switchgrass	5-10	5-20	5-20	5-20	5-10	5-10	5-10	5-10		5-10		
Western wheatgrass	5-40	5-20	5-20	5-20	5-30	5-20	5-40	5-60	5-90	5-30	5-20	5-35
1/ On these sites a minimum of three species must be planted.												
2/ Minimum of four grasses, at least one warm and/or cool season species.												
3/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in #4, individual forb and shrub species will be limited to 4% of the mixture.												
4/ These species will be limited to no more than 2% of the mixture.												

TABLE 1. **Ecological (Range) Site Recommended Species for MLRA 54 & 58 C&D - continued**  
Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, All Seeding Mixtures must equal 100%)

Species	Wet Land and Wet Meadow	Ecological Sites											
		Subirrigated	Limy Subirrigated	Loamy Overflow	Loamy Terrace	Sandy Terrace	Clayey Terrace	Saline Lowland	Closed Depression 1/	Sandy	Sands	Clayey	
<b>Forbs 3/</b>													
Cudweed sagewort 4/		*		*	*	*	*				*	*	*
Dotted gayfeather					*	*	*				*	*	*
Maximillian sunflower	*	*	*	*	*	*	*						
Plains Coreopsis	*	*	*	*									
Prairie coneflower 4/					*	*	*				*	*	*
Purple coneflower					*							*	
Purple prairieclover		*	*	*	*	*	*				*	*	*
Shell-leaf penstemon						*					*	*	
Stiff sunflower 4/	*	*	*	*	*	*	*				*	*	*
Western yarrow 4/		*	*	*	*	*	*	*	*	*	*	*	*
<b>Shrubs 3/</b>													
Fourwing Saltbush									*				
Leadplant				*	*	*	*				*	*	
Prairie rose		*	*		*	*	*				*	*	*
Western snowberry		*	*	*	*	*	*				*	*	*
Winterfat					*		*						*

1/ On these sites a minimum of three species must be planted.

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TABLE 1. **Ecological (Range) Site Recommended Species for MLRA 54 & 58 C&D - continued**

Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, All Seeding Mixtures must equal 100%)

**Ecological Sites**

Species	Loamy	Thin Loamy d and Shallow	Limy Sands	Thin Clayey	Thin Sands	Shallow Loamy	Shallow Sandy	Shallow Clay	Claypan and Thin Claypan	Sandy Claypan	Shallow Gravel and Very Shallow
<b>Grasses 2/</b>											
American sloughgrass											
Beardless wildrye											
Big bluestem	5-20										
Bluebunch wheatgrass		5-20		5-20		5-20		5-20			5-20
Blue grama	5-10	5-10	5-10	5-20	5-10	5-30	5-20	5-30	5-30	5-10	5-20
Canada wildrye	5-10	5-10	5-20		5-20	5-10	5-20			5-20	
Green needlegrass	5-30	5-20	5-10	5-20		5-10	5-10	5-10	5-20	5-20	5-10
Indiangrass											
Little bluestem		5-30	5-30	5-20	5-30	5-30	5-30	5-20	5-10	5-20	5-30
Needle and Thread	5-10	5-10	5-20		5-20	5-20	5-20		5-20	5-20	5-20
Nuttall alkaligrass											
Porcupinegrass	5-10	5-15		5-10							
Prairie cordgrass											
Prairie dropseed											
Prairie junegrass	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10
Prairie sandreed			5-30		5-40		5-30			5-30	5-10
Reed canarygrass											
Sand bluestem			5-30		5-40		5-30			5-20	5-10
Sand dropseed			5-10		5-10		5-10			5-10	5-10
Sideoats grama	5-30	5-30	5-20	5-30	5-20	5-30	5-30	5-30	5-10	5-20	5-30
Slender wheatgrass	5-10	5-10		5-10		5-20		5-20	5-20	5-20	5-20
Switchgrass											
Western wheatgrass	5-30	5-20	5-20	5-30	5-10	5-20	5-10	5-30	5-50	5-35	5-20

1/ On these sites a minimum of three species must be planted.

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TABLE 1. **Ecological (Range) Site Recommended Species for MLRA 54 & 58 C&D - continued**

Minimum and Maximum Percentage of Species per Site (Four Grass Species Minimum, All Seeding Mixtures must equal 100%)

Species	Ecological Sites										
	Loamy	Thin Loamy	Thin Sandy	Thin Clayey	Thin Sands	Shallow Loamy	Shallow Sandy	Shallow Clayey	Claypan and Thin Claypan	Sandy Claypan	Shallow Gravel and Very Shallow
<b>Forbs 3/</b>											
American vetch	*										
Blanketflower	*	*		*			*	*	*	*	*
Canada milkvetch											
Cudweed sagewort 4/	*								*	*	
Dotted gayfeather	*	*	*	*	*	*	*	*		*	*
Maximilian sunflower	*										
Plains Coreopsis											
Prairie coneflower 4/	*	*	*	*	*	*	*	*	*	*	*
Purple coneflower		*	*	*	*	*	*	*		*	*
Purple prairieclover	*	*	*	*	*	*	*	*		*	*
Shell-leaf penstemon			*		*					*	
Stiff sunflower 4/	*	*	*	*	*	*	*	*	*	*	*
Western yarrow 4/	*	*	*	*	*	*	*	*	*	*	*
<b>Shrubs 3/</b>											
Fourwing Saltbush								*	*		
Leadplant	*		*		*					*	
Prairie rose	*	*	*	*	*	*	*	*	*	*	*
Western snowberry	*										
Winterfat	*	*		*		*		*	*		

1/ On these sites a minimum of three species must be planted.

2/ Minimum of four grasses, at least one warm and/or cool season species.

3/ Forbs and shrubs will be limited to a maximum of 25% of the total mixture. Except those species noted in #4, individual forb and shrub species will be limited to 4% of the mixture.

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