Practice Specification
Critical Area Planting (Code 342)

1. Scope

The work will consist of establishing vegetation on sites with existing or expected high erosion rates or degraded sites that usually cannot be stabilized by ordinary conservation treatment and/or management. This specification (including references made within to other conservation practice standards and technical notes), Form KS-ECS-4, Grass Seeding, and/or Form KS-ECS-5, Tree/Shrub Planting, will be used to design the practice. Practice application will be documented on Form KS-ECS-4, Grass Seeding and/or Form KS-ECS-5, Tree/Shrub Planting and in the conservation plan. See also Kansas Conservation Practice 342, Critical Area Planting, Statement of Work for additional information on design, installation, and certification requirements.

2. Site Preparation

Necessary shaping and smoothing will be made before seedbed preparations are started. Where practical, the area should be shaped and graded to allow the use of conventional equipment for seedbed preparation, seeding, and mulching.

Where needed to aid with revegetation, topsoil will be salvaged from borrow areas and respread onto shaped and graded areas. Topsoil may be replaced in lifts no greater than 6 inches. Prior to topsoil application, the regraded area will be deep chiseled or ripped to reduce soil movement and to promote root penetration.

3. Seedbed Preparation

Seedbed preparation is to take place immediately after final shaping and grading. All tillage operations should be performed across the general slope of the land. The seedbed should be tilled to a depth of 3 inches. All loose soil will be smoothed and packed to a degree that results in a firm seedbed. A seedbed is considered sufficiently firm when a person walking across the field leaves a footprint no deeper than 1/8 of an inch. All debris, such as wood, stones, and other objects that will interfere with seeding and/or maintenance, will be removed.

Soil fertility and pH level will be amended to meet the needs of the planned plant species and to support the intended purpose. Soil amendments when applied should be based on results of a soil test. However, at the discretion of the responsible technician, fertilizer application rates may be based on the general recommendations provided in Table 1, in lieu of using results from the soils test. If native species are to be used, nitrogen should not be applied until plants are established.

Manure may be substituted for commercial fertilizer, on the basis of 1 ton of manure being equivalent to 10 pounds of nitrogen, 5 pounds of phosphate, and 10 pounds of potassium, or according to material analysis test results. Manure will be incorporated within 24-hours of application to retain nutrient value and reduce potential nutrient losses.

Table 1. Fertilizer Application Rates

Seeding Zone	Pounds Per Acre			
	Nitrogen	Phosphate	Potassium	Lime
Western	20 – 30	*	*	
Central	30 – 40	40 – 60	*	
Eastern	40 – 50	60 – 80	*	*

* In areas of known phosphate, potassium, and lime deficiencies, apply the amount recommended locally for agricultural production or the amount recommended by a soils test.

On sites where suitable topsoil exists, do not apply nitrogen fertilizer in the establishment year where native plant species are to be seeded.

4. Vegetation Seeding

• **Seedbed**

Seeding of permanent vegetation may be made into the following types of seedbeds:

Standing Cover—Drill or broadcast (depending on slope) a suitable, noncompetitive cover crop such as sorghum or hybrid Sudangrass. See Kansas Conservation Practice Standard 340, Cover Crop, for a listing of suitable species and seeding rates.

Surface Mulch—Crop stubble, non-growing weeds, or other plant residue (dead litter cover) that remains on the surface through chemical or non inversion-type of tillage operations. Various mulching material may also be applied before or after the permanent seeding takes place. For mulching materials and amounts, refer to Kansas Conservation Practice Standard 484, Mulching.

Clean Tilled—Prior to planting, the seedbed will be prepared by using tillage equipment which will penetrate 2 to 3 inches and leave a firm but friable seedbed. This may not be an option where erosion is a concern, unless proper amounts of mulching material are applied after seeding.

• **Seeding Method**

A grass drill is preferred. The drill should be equipped with double–disk openers, a depth-control device for proper seed placement, and press wheels or drag chains. The drill should be operated across a slope. The seed should be planted to a depth of 1/4 to 3/4 of an inch. On areas too steep for equipment operation, seed mixtures may be broadcast or hydroseeded. For broadcasting, the seed will be incorporated by harrowing, packing, raking by hand, or other suitable operation. For hydroseeding, the selected seed mixture and mulching material will be applied according to manufacturers' recommendations.

• **Seeding Dates**

Seeding periods will be as follows:

- Cool-season species: August 15—October 1; December 1—April 15
- Warm-season species: December 1—May 15
- Bermuda grass sprigs: March 1—May 15

An extension of 2 weeks from the cutoff seeding date may be given by the district conservationist, based on favorable moisture and temperature conditions.

When it is not practical to wait for the seeding periods as noted above, and at the discretion of the responsible technician, permanent seeding may be completed as soon as construction work is completed. Where soil erosion is a concern, or at the discretion of the responsible technician, mulch will be applied according to Kansas Conservation Practice Standard 484, Mulching, immediately following completion of the permanent seeding.

• **Plant Species Selection**

For approved plant species varieties, refer to Kansas Plant Materials Technical Note KS-1, Grass and Forb/Legume Varieties Approved for Use in Kansas. For seeding zone delineation, see Figure 1. Where varieties are not available or are not adapted to the site, common (native harvest) seed from a source location as near to the area being seeded as possible may be utilized. For mileage restriction, native grass seed will not be used more than 250 to 400 miles north or 100 to 150 miles south of its point of origin. An increase of elevation of 1,500 feet is equivalent to a move of roughly 150 miles to the north. Seed from a southern source will be given preference over seed from a northern source. Seed source must be identified to the state and county level in order to certify mileage and elevation adequacy.

Seed labeling, quality, and seed testing will be in accordance with Kansas Seed Law. For Kansas Seed Law, the germination test is valid for 9 months after the end of the month the test was made so long as the seed remains in Kansas. Federal Seed Law pertains to seed shipped across state lines and the germination test is valid for 5 months after the end of the month the test was made.

For seed purchased during the valid period of the germination test, the analysis report may be considered current for the full seeding period in effect at the time of purchase. For example, if seed is purchased March 1 and the germination test date expires March 31, the analysis report may be considered current if the seed is planted by May 15. If the seed is to be planted during a later seeding season, a new germination test will be performed.

A cooperator who raises and/or harvests seed for personal use must have a seed analysis performed. A copy of the report must be furnished to certify that quality and mileage restrictions are met.

5. Vegetation Sprigging

Vegetation may be established through the use of sprigs. Bermuda grass is typically established in this method, although seed type varieties of Bermuda grass are currently available.

- Seedbed
  Sprigs should be planted into a firm, moist seedbed.
- Sprigging Method
  It is desirable to plant Bermuda grass sprigs that are still dormant. Use freshly dug sprigs from areas where the top growth has been removed. Sprigs should be planted within 24 hours after they are dug. Keep sprigs moist until planted. Plant the sprigs with a mechanical sprigger or hand plant at a rate of 16 to 24 bushels per acre in 36 to 42 inch row spacing. Sprigs should be covered with 1 to 3 inches of soil and be well packed after planting. Subsequent fertilizer application will be based on a soil test, Table 1, or local extension recommendations.

  Sprigging is also used as a method to establish vegetation on upstream berms of earth dams. Prairie cordgrass and common reed are typically planted as sprigs and are used to provide vegetative wave protection to the embankment. A row of sprigs will be planted at the normal pool elevation along with a minimum of 3 rows planted below and 3 above the normal pool elevation. Rows should parallel the centerline of the dam and be spaced no greater than 3 feet apart. Sprigs within the rows should be placed every foot at a depth of 2 to 4 inches. Care should be taken to place prairie cordgrass sprigs with the growing point up. Sprigs should be planted while they are still dormant. Sprigs should not be permitted to dry out.

  It may be necessary to control the water level of a structure to facilitate the establishment of the sprigs on the berm. Once prairie cordgrass and common reed become well established, both can tolerate extended periods of inundation. However, during the establishment period, seedlings of both species may be damaged by extended inundation periods.
- Sprigging Date
  Sprigging should take place when soil moisture conditions are optimum during the period of March 1 to May 15.
- Plant Species Selection
  For approved plant species varieties, refer to Kansas Plant Materials Technical Note KS-1.

6. Vegetation Planting Trees/Shrubs

Refer to Kansas Forestry Technical Note KS-9, Tree/Shrub Establishment and Maintenance Guidelines, for planting information and the Field Office Technical Guide (FOTG), Section II, Windbreaks and Environmental Plantings Interpretations, for species suitability. It may be necessary to complement the woody planting with a seeding of herbaceous species to aid with erosion control during the woody establishment period.

7. Maintenance

Maintenance will be carried out during establishment to aid in survival of the plant species. To manage weed competition, mow the weeds when they reach a height of 6 to 8 inches. If chemicals are used in lieu

of mowing, they must be federally and locally registered and must be applied in strict accordance with authorized registered uses, directions on label, and other federal and state polices and requirements.

Livestock grazing will be excluded from the area during establishment. Flash grazing for weed control is permissible during plant establishment, if the grazing level is closely monitored. Once the plants are established, grazing may take place within the limits of proper management.

Where introduced perennial herbaceous species are used, maintenance will require periodic soil testing to determine fertilizer needs of the species.

8. Specific Treatment for Critical Areas

• Dunes and Blowouts

Blowouts will be enclosed with a permanent fence when they are larger than approximately 2 acres and the area is grazed during the growing season. The fence will be established away from the edges of the blowout.

Fencing of the blowout is not needed if the adjacent area is not grazed by livestock, or if it is used only during the winter, except in areas of heavy livestock concentrations. Fencing is not necessary if the grassland that contains the blowout is used only occasionally for partial summer use, such as with a planned grazing system.

Natural recovery (no seeding) by protection is permissible where desirable species are present in sufficient amounts and the character of the blowout will permit stabilization in the desired period of time. A temporary fence is needed to prevent livestock use of the area.

Seedbed preparation will consist of establishing a cover crop according to Kansas Conservation Practice Standard 340, Cover Crop, or in lieu of a cover crop, apply a natural mulch or manure according to Kansas Conservation Practice Standard 484, Mulching.

For species selection and seeding rates, see Table 2. For plant species varieties, refer to Kansas Plant 9iiiiTechnical Note KS-1. Adapted native forbs and/or legumes may be added in addition to the full grass seeding mixture at a rate not to exceed one (1) pound pure live seed (PLS)/acre. See Table 6 for a listing of forb/legume species.

Table 2. Dunes and Blowout Areas

Species	Full Seeding Rate (#PLS/acre)	% of Mixture	Remarks
Native			
Big bluestem	12	0 – 10	Use as second choice to Sand bluestem
Blue grama	3	0 – 10	
Indiangrass	12	0 – 10	
Little bluestem	8	10 – 20	
Prairie sandreed	8	20 – 30	
Sand bluestem	12	10 – 30	
Sand lovegrass	2	10 – 20	
Sideoats grama	12	0 – 10	
Switchgrass	6	10 – 30	

• Earth Dams

All construction areas not covered by permanent water and any related area expected to produce sediment will be seeded to a permanent mixture.

Topsoiling—Topsoil will be placed at a minimum depth of one (1) foot and a maximum depth of 3 feet on all areas designated for topsoiling. To aid with vegetation establishment, topsoil will be applied as follows:

Frontslope—Where riprap is used, topsoil will be placed from the upper elevation of the riprap to the top of the dam. Where riprap is not used, topsoil placement will begin at the lower elevation of the vegetative berm and extend to the top of the dam.

Emergency Spillway, Principal Spillway Outlet Channel, Dikes, and Spoil Areas—For unconsolidated or consolidated material that is determined to be adequate for erosion control and for plant establishment, no topsoiling is needed. Where the material is questionable for plant establishment, but suitable for erosion control, topsoil will be considered when aesthetic and wildlife needs have been identified and are considered important. If the material is not suitable for either erosion control or plant establishment, topsoil will be applied.

Vegetative Treatment of Upstream Berms—Vegetative treatment of the upstream berm for embankment protection (for the flatter designed front slopes) will consist of seeding and/or sprigging. See previous Section 5 on sprigging upstream berms. Vegetative wave protection for the dam embankment will not work well where there is an extreme water level fluctuation for extended periods of time. Under these conditions, it is difficult to get the right type and amount of vegetation established to dissipate wave energy before it reaches the embankment. Procedures for determining the need for special wave protection measures including vegetated berms are included in Technical Release No. 56, A Guide for Design and Layout of Vegetated Wave Protection for Earthen Embankments and Shorelines and the Engineering Field Handbook. Water level fluctuation, if not too large or too prolonged, may be accommodated by dividing the berm into 2 different vegetative establishment zones. Each zone would be planted or seeded to species suited to those particular growing conditions. See Table 3 for species selection and seeding rates for Zones 1 and 2. For plant species varieties, refer to Kansas Plant Materials Technical Note KS-1.

• Zone 1 will typically be saturated and/or inundated for extended periods of time. This zone is usually 6 inches in elevation above and 1.5 feet in elevation below the normal pool elevation. The vegetation selected for this zone should be able to tolerate these moisture conditions as well as providing a dense, upright, heavy, and flexible stem that will aid in the dissipation of wave energy.

• Zone 2 typically covers the area from just above the normal pool elevation to the base of the dam embankment. This zone may be inundated for short periods of time, but will mostly be in dryer soil conditions. Species should be able to tolerate these conditions.

Seeding of Earth Dam Components—Seeding of earth dam components will be completed as shown in Table 3. However, for small farm type ponds (2 acres or less total disturbance), one (1) seed mixture developed from the Borrow Area, Waste Area, and Dam Fill component column may be used to seed the entire disturbed area. Adapted native forbs and/or legumes may be added in addition to the full grass seeding mixture at a rate not to exceed one (1) pound PLS/acre. See Table 6 for a listing of forb and legume species.

Table 3. Earth Dams

Species	Full Seeding Rate (#PLS/acre)	Maximum % in Mixture			Remarks
		Borrow Area, Waste Area, Dam Fill	Stilling Basin Outlet, Shoreline, Upstream Berm	Spill way	
Native					
Big bluestem	12	10	10		Berm Zone 2 adapted
Blue grama	3	20		20	
Buffalograss	10	30	30	30	Berm Zone 2 adapted

Indiangrass	12	10	10		Berm Zone 2 adapted
Little bluestem	8	20	10	20	Berm Zone 2 adapted
Prairie cordgrass			Sprigs		Berm Zone 1, 2 adapted
Sideoats grama	12	100	10	30	Berm Zone 2 adapted
Switchgrass (Kanlow)	6		40		Berm Zone 1, 2 adapted
Switchgrass	6	100	10		Berm Zone 2 adapted
Virginia wildrye	25		40		Berm Zone 2 adapted
Western wheatgrass	20	100	30	100	Berm Zone 2 adapted
Introduced					
Bermudagrass	5	100		100	
Common reed			Sprigs		Berm Zone 1, 2 adapted
Intermediate wheatgrass	18	100		100	
Pubescent wheatgrass	18	100		100	
Smooth brome*	16	100		100	
Tall fescue*	16	100		10	

* Brome and fescue are limited to 50% if seeded in conjunction with native species. For western seeding zone, brome is limited to 50% and fescue is not approved. Native or introduced forbs or legumes may be added in addition to the grass mix at a rate not to exceed one (1) pound PLS/acre. See Table 6 for a listing of forb and legume species.

• **Grassed Waterway**

A mixture of species is preferred over a single species seeding. Native species are in general more tolerant to cropland chemicals than are cool-season introduced grasses. When a waterway is constructed to meet design criteria for an annually vegetated waterway, the following management and planting recommendations should be taken into account:

• Close grown crops are usually planted in annually vegetated waterways.

• Planting equipment that leaves a ridge less than 2 inches high should be used.

• Crops may be planted either parallel or perpendicular to the flow of water.

• The bottom should be left relatively flat after all seedbed and seeding operations.

For perennially vegetated waterways, see Table 4 for species selection and seeding rates. Adapted native forbs and/or legumes may be added in addition to the full grass seeding mixture at a rate not to exceed one (1) pound PLS/acre. For plant species varieties, refer to Kansas Plant Materials Technical Note KS-1.

Table 4. Grassed Waterway, Ephemeral/Classic Gully, and Other Critical Treatment Areas

Species	Full Seeding Rate (#PLS/acre)	Maximum % in Mixture			Remarks
		Western Zone	Central Zone	Eastern Zone	
Native					
Big bluestem	12	10	30	30	If sandy, use Sand bluestem
Blue grama	3	20	10	10	
Buffalograss	8	30	10	10	
Indiangrass	12	10	30	30	
Little bluestem	8	20	20	20	
Prairie cordgrass	13		20	20	Adapted to wet sites
Sideoats grama	12	100	100	100	
Switchgrass	6	100	100	100	Use “Kanlow” for wet sites
Virginia wildrye	25	10	30	30	Adapted to wet sites
Western wheatgrass	20	100	100	100	
Introduced					
Bermudagrass	5		100	100	
Intermediate wheatgrass	18	100	100	100	
Pubescent wheatgrass	18	100	100	100	
Smooth brome*	16	50	100	100	
Tall fescue*	16		100	100	
Tall wheatgrass	20	100	100	100	Adapted to saline areas

* Brome and fescue are limited to 50% if seeded in conjunction with native species. Native or introduced forbs or legumes may be added in addition to the grass mix at a rate not to exceed one (1) pound PLS/acre. See Table 6 for a listing of forb and legume species.

• **Reconstructed Mined Land**

Suitable annual cover crops will be established until a suitable seedbed is prepared for the permanent mix. See Kansas Conservation Practice Standard 340, Cover Crop. On acid sites, it may require cover crops to be established for a period of 1 to 3 years so that proper soil amendments may be applied. Liming rates to amend soil pH will be based on results of soil test.

See Table 4 for species selection and seeding rates. For plant species varieties, refer to Kansas Plant Materials Technical Note KS-1.

In addition to herbaceous species, woody species may also be planted on reconstructed mined land. See Kansas Forestry Technical Note KS-9 for planting information and FOTG, Section II, Windbreaks and Environmental Plantings Interpretations for Species Suitability.

• **Urban and Developing Areas**

For short, intermediate, and long-term cover crops, see Kansas Conservation Practice Standard 340, Cover Crop.

• **Ephemeral and Classic Gullies**

Remove excess organic material and other trash from the area to be shaped. Fill existing gullies. All fill material will be thoroughly compacted.

Where gullies have depths greater than 3 feet, it may be necessary to slope the sides of the gully prior to filling, in order to obtain sufficient compaction. Gully side slopes prior to filling will not be steeper than 1:1. Gullies deeper than 3 feet will be overfilled by 10%.

Gully areas will be shaped to either a trapezoidal or parabolic cross section. A parabolic cross section can be approximated by shaping a nearly level bottom width that is approximately equal to half the finished top width. Minimum construction depth will be 0.5 foot. The standard dimensions that may be used are provided in Table 5. Kansas Form KS-ECS-20, Critical Area Planting Ephemeral Gully, will be used for design documentation.

Table 5. Standard Dimensions for Shaping Ephemeral Gully

Cross Section Dimensions* (feet)			Maximum Contributing Drainage Area (acres)		
Top Width	Depth	Bottom Width	Western Zone	Central Zone	Eastern Zone
8	0.5	2	4	1	1
16	0.5	8	20	3	2

* Table dimensions may be adjusted by 10% to accommodate farm machinery.

Grass strips may be individually designed. Each strip must have the capacity to contain runoff from a 5-year, 24-hour storm assuming C retardance. Velocities will not exceed 4 feet/second, assuming D retardance. When strip width exceeds 20 feet, they will be designed and constructed according to Kansas Conservation Practice Standard 412, Grassed Waterway.

See Table 4 for species selection and seeding rates. For plant species varieties information, refer to Kansas Plant Materials Technical Note KS-1.

Table 6. Listing of Native, Introduced Forbs and Legumes

Native Forbs and Legumes* **	Legume	Growth Habit	Area of Adaptation		
			East	Central	West
Black Sampson—*Echinacea angustifolia*		Perennial	x	x	x
Black-Eyed Susan—*Rudbeckia hirta*		Perennial	x	x	
Butterfly Milkweed—*Asclepias tuberosa*		Perennial	x	x	
Clasping Coneflower—*Dracopis amplexicaulis*		Annual	x		
Dotted Gayfeather—*Liatris punctata*		Perennial	x	x	x
Englemann's Daisy—*Engelmannia pinnatifida*		Perennial	x	x	x
False Sunflower—*Heliopsis helianthoides*		Perennial	x	x	
Grayhead Prairie Coneflower—*Ratibida pinnata*		Perennial	x		
Illinois Bundleflower—*Desmanthus illinoensis*	x	Perennial	x	x	x
Indian Blanket Flower—*Gaillardia pulchella*		Annual	x	x	x
Lance-Leaf Coreopsis—*Coreopsis lanceolata*		Perennial	x		
Leadplant—*Amorpha canescens*	x	Perennial	x	x	x
Maximilian Sunflower—*Helianthus maximiliani*		Perennial	x	x	x
Missouri Evening Primrose—*Oenothera macrocarpa*		Perennial	x	x	
New England Aster—*Symphyotrichum novae-angliae*		Perennial	x		
Pale Echinacea—*Echinacea pallida*		Perennial	x		
Pitcher Sage—*Salvia azurea*		Perennial	x	x	x
Plains Coreopsis—*Coreopsis tinctoria*		Annual	x	x	x
Late Purple Aster—*Symphyotrichum patens*		Perennial	x		

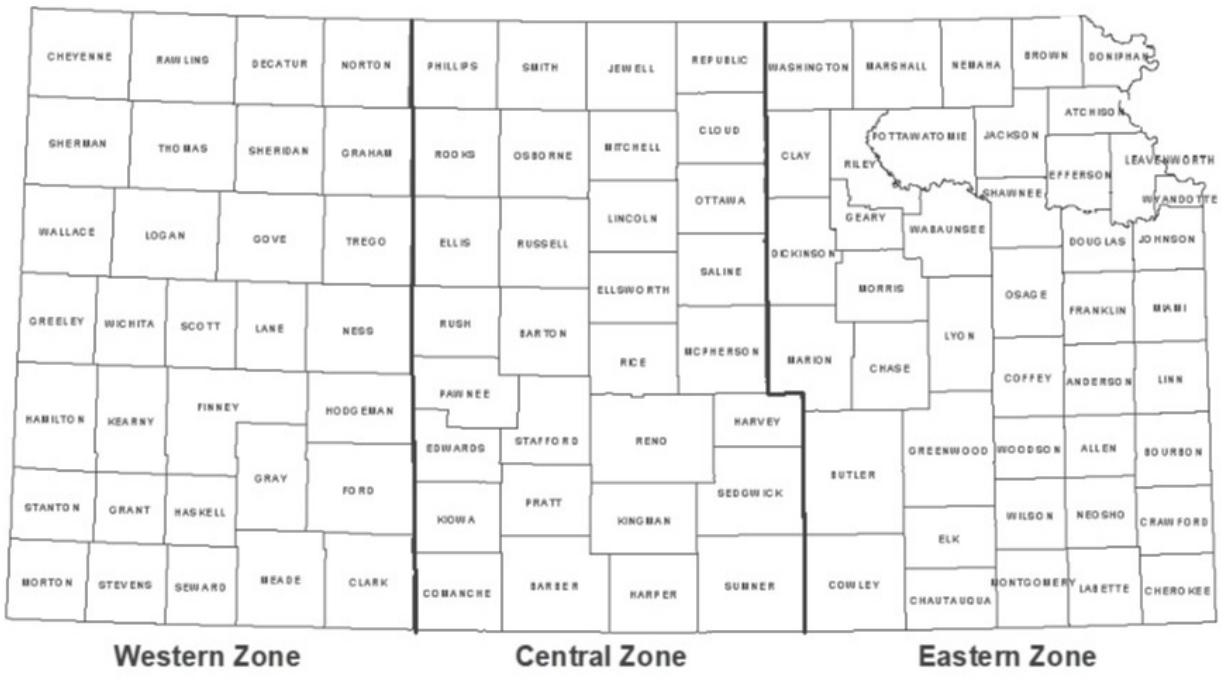
Purple Prairie-Clover—*Dalea purpurea*	x	Perennial	x	x	x

Roundhead Lespedeza—*Lespedeza capitata*	x	Perennial	x	x	
Large Beardtongue—*Penstemon grandiflorus*		Perennial	x	x	
Showy Partridge Pea—*Chamaecrista fasciculata*	x	Annual	x	x	
Thickspike Gayfeather—*Liatris pycnostachya*		Perennial	x		
Upright Prairie Coneflower—*Ratibida columnifera*		Perennial	x	x	x
White Prairie-Clover—*Dalea candida*	x	Perennial	x	x	
Introduced Legumes*					
Alfalfa	x	Perennial	x	x	x
Bird's-Foot Trefoil	x	Perennial	x		
Red Clover	x	Perennial	x		

* Forb and legume species and varieties must be adapted to the site. For guidance on the suitability of species not listed, refer to FOTG Section II, Forage Suitability Groups, Pasture and Hayland Suitability Groups descriptions.

** Adapted native forbs and/or legumes may be added in addition to the full grass seeding mixture at a rate not to exceed one (1) pound PLS/acre.

Figure 1. Kansas Seeding Zone Delineation



Specific Site Requirements

Reset