

TECHNICAL NOTES

STATE OFFICE

STILLWATER, OKLAHOMA 74074

ECOLOGICAL SCIENCES TECHNICAL REFERENCES

FOR IN-SERVICE USE ONLY

BIOLOGY OK-30

May 2, 2003

RE: List of Forbs, Legumes, Trees and Shrubs Best Suited for Wildlife Under the Conservation Reserve Program (CRP) Sign-up 26 and Related Guidance.

This technical note is to be used for guidance for CRP sign-up 26. Approval of any plants not included in this Technical Note will be made on a case-by-case basis. Submit any requests to consider alternative species to the State Resource Conservationist.

This Technical Note is to be used with other appropriate field office technical guide standards and specifications for new plantings and cover enhancements.

/s/ Leslie R. Conner acting for
M. DARREL DOMINICK
State Conservationist

Cover Subfactor Guidelines
For
CRP Sign-up 26

CP1 - Permanent Introduced Grasses And Legumes

N1a Approved Cover Mixes for CP1 Establishing Permanent Introduced Grasses and Legumes.

Consult Table 1 below for species selection and planting rates. Refer to Pasture and Hay Planting (512) standard and specifications for adapted grass species, planting rates, and establishment criteria. When mixtures are used, each grass should be at least 10% of the composition. Refer to Example 2 for "how to information" on seed mixture calculations.

CP1 Establishing permanent introduced grasses and legumes. Each base grass shall compose at least 10% of a mixture. Refer to Pasture and Hay Planting Standard (512)	Assigned Point Score
Planting of two to three introduced grass species. Compatible cool season species include mixtures of two or more species of smooth brome, meadow brome, fescue, orchardgrass, tall wheatgrass, and intermediate wheatgrass (Luna, Manska, pubescent) within their range of adaptation. Another compatible warm season grass mixture is yellow (Plains, WW Spar, Ironmaster, Ganada) and Caucasian introduced bluestems within their range of adaptation. Warm season grasses cannot be combined with cool season grasses, or vice/versa, to meet this requirement.	10
Mixture of at least 4 species, with at least 3 introduced grasses and at least 1 forb or legume species. Compatible species include mixtures of smooth brome, meadow brome, fescue, orchardgrass, tall wheatgrass, and intermediate wheatgrass (Luna, Manska, pubescent) within their range of adaptation. The mixture must also contain at least 30% of a forb and/or legume from Table 1. Up to 5% of the forbs and/or legumes can be annuals or biennials best suited for wildlife. {Native forbs and/or legumes can also be used in this category. The planting rates for natives shall be prorated from their full planting rate, depending upon their percentage in the mix, from Range Planting (550) Table 1, with no more than 5% annuals.}	40

Table 1. Legumes For CP1 Best Suited For Wildlife

Species <u>1/ 2/</u>	Life Span <u>3/</u>	Full Seeding Rate PLS Lbs./Ac	Inoculum Type <u>4/</u>	Area Of Adaptation
alfalfa (can be the grazing varieties of alfalfa)	P	10	A	Statewide
birdsfoot trefoil	P	4	K	Fertile well drained soils, 26" rainfall or greater, can tolerate moderate salinity. Not persistent with warm season grasses.
'Cicer' milkvetch	P	12	Astragalus	Greater than 18" precipitation, tolerates slight acidity to moderate alkalinity.
red clover	B	10	B	NE, SE - heavy soils med-high fertility and fertile sandy loams high in available phosphorus.
sainfoin	P	20	F	Neutral to calcareous soils
white clover	P	10	B	SE, NE, first and second banks, clay and loamy soils and on more productive upland soils.
arrowleaf clover	A	7	O	NE, SE, well drained soil,
Austrian Winter Pea	A	40	C	Western part of the state, intolerant of low pH soils.

Species 1/ 2/	Life Span 3/	Full Seeding Rate PLS Lbs./Ac	Inoculum Type 4/	Area Of Adaptation
cowpeas	A	40	EL	Statewide
crimson clover	A	9	R	NE, SE - well drained soils except high calcareous.
hairy vetch	A	20	C	Statewide - well drained soils.
Korean lespedeza	A	12	EL	NE, SE
common lespedeza	A	12	EL	SE - acid soils.
rose clover	A	6	WR	18 - 25 inch rainfall, not on wet or poorly-drained soils.
sweetclover	A & B	5	A	Central, SW, NW - well drained soils.

1/ Legumes can be planted at the same time the base grass is planted.

2/ Use current soils test to determine if there are proper levels of phosphorus and potassium. Lime to raise pH to at least 6.0.

3/ A = Annual B = Biennial P = Perennial

4/ These inoculum types are specific to each species.

CP2 - Establishment of Permanent Native Grasses

N1a Approved Cover Mixes for CP2, Permanent Native Grasses, Forbs, & Legumes.

Refer to Example 1, seed mixture calculations. All plantings under CP2 will be natives done according to the Range Planting (550) standard and specification or natives that are planted under the Pasture and Hay Planting (512) standard and specification. Refer to these standards for adapted species, seeding rates, and establishment criteria.

CP2 ESTABLISHMENT OF PERMANENT NATIVE GRASSES. (All Native plants) Select adapted native plants from the Range Planting (550) or Pasture and Hay Planting (512) standard and specification.	Assigned Point Score
A mixture of at least three native species, containing at least 80% of two grasses listed in (512) Table 1 and at least 10% of one forb or legume listed (550) Table 1.	20
A mixture of five or more native species containing at least 80% of 3 grasses and at least 10% of one forb or legume listed in (550) Table 1. No more than 2 percent can be annuals.	50

CP3 Tree Planting (Pine)

Refer to CP4D, 50 point cover category, for native herbaceous plantings best suited for wildlife in pine plantings. CP3 plantings will be done according to Tree/Shrub Establishment (612) standard and specifications. Refer to Table 2 for shrubs species selection.

CP3 Tree planting	Assigned Point Score
Southern Pines (softwoods) - Solid stand of pines/softwoods (planted at more than 550 trees per acre.)	10
Southern Pines (softwoods) - Pines/softwoods planted at a rate of 500 to 550 per acre depending upon the sited index (state-developed standards) with 10 - 20 percent openings managed to a CP4D wildlife cover. Openings for Southern pines are not to be less than a minimum of 2 acres or a maximum of 5 acres in size for fields of 20 acres and larger. Smaller fields will be pro-rated. Openings may include buffers on the interior of the field. Field edges (borders) may be used if they	50

CP3 Tree planting	Assigned Point Score
<p>are irregular in shape and average 30 feet in width.</p> <p>Natural regeneration of native herbaceous or shrubby vegetation with required maintenance may be permitted within open areas if it is consistent with NRCS technical standards, the Northern Bobwhite Conservation Initiative, and concurred with by State FWS or USFWS officials.</p> <p>Open areas of native grasses and/or shrub plantings (50 point cover category, CP4D) best suited for wildlife in the area shall be considered CP3 for EBI scoring and contract purposes</p>	

CP3a - Hardwood Tree Planting (Native)

Table 2 includes a list of hardwood trees for both hard and soft mast producing species. Hardwood trees not included on this list will be treated as non-mast producing species and/or not among the best suited species for wildlife. CP3 plantings will be done according to Tree/Shrub Establishment (612) standard and specifications.

CP3a - Hardwood tree planting	Assigned Point Score
Solid stand of non-mast producing hardwood species	10
Solid stand of a single, hard mast-producing species	20
Mixed stand of hardwood species best suited for wildlife in the area.	30
Mixed stand (3 or more species) of hardwood species best suited for wildlife in the area.	50

CP4B - Permanent Wildlife Habitat (Corridors) Non-Easement

N1a Approved Cover Mixtures for CP4B, Permanent Grasses, Forbs, Legumes, Trees and/or Shrubs.

General - These corridors are intended to provide connecting links, or travel lanes between habitat types. Corridors may be from one to three chains (66-198 ft) in width. 30 - 60 percent of the acreage shall be planted to woody species. The remainder of the corridor acreage must be planted to herbaceous plants. Refer to the standard and specifications for Range Planting (550) to determine the minimum and maximum percentages of each native grass species to be included in the mixture and for information on zone of adaptability. If four-winged saltbush is selected, plant a 100% seeding rate on the acreage devoted to saltbush. Pro-rate the planting to the percent desired in the mixture. Tree and shrub plantings will be selected from the "Shrub" section of Tables 2, and planted in accordance with state standard and specifications Tree/Shrub Establishment (612). Refer to Shrub **Planting Specifications for CRP Plantings** listed under CP4D for plant densities. The only approved trees are those listed in the Ecological Site Description for the soil type. Refer to the standard and specifications for Pasture and Hay Planting (512) and Range Planting (550) Table 1, for information on forbs and legumes.

Distribution of Shrub Plantings - Each offer will have at least 5 individual planting locations or long connecting strips. Planting root sprouting species in a "plus" pattern will facilitate fill-in of the mott.

Strip plantings should be placed as evenly across the corridor as is practical considering factors such as prevailing winds, slope, contour, and soils to optimize erosion and wildlife benefits.

Other - Biologists of the Oklahoma Department of Wildlife Conservation should be consulted when developing plans for this CRP practice. Foresters with the Oklahoma Forestry Services Division should be consulted when developing trees and shrub planting plans.

CP4B - PERMANENT WILDLIFE HABITAT (CORRIDORS) NON-EASEMENT	Assigned Point Score
Mixed stand (Minimum of 4 species) of grasses, trees, shrubs, forbs, or legumes planted in mixes, blocks, or strips best suited for various wildlife species in the area.	40
Mixed stand (Minimum of 5 species) of either predominately native species including grasses, forbs, legumes, shrubs, or trees planted in mixes, block, or strips best suited to providing wildlife habitat. (Only native grasses are authorized)	50

CP4D - Permanent Wildlife Habitat Non-Easement - Whole Field Plantings

General - Tree and/or shrub plantings will be included on 10 - 30% of the acreage where needed to meet the specific needs of wildlife species and where adapted to the site. The remainder of the acreage must be planted to herbaceous plants. The herbaceous mixture must include at least 30% of the full seeding rate forbs and/or legumes selected from Tables 1, except that up to 5% of the forbs and/or legumes can be annuals or biennial. Pro-rate the planting to the percent desired in the mixture. Refer to the standard and specifications for Range Planting (550) to determine the minimum and maximum percentages of each native species to be included in the mixture and for information on zones of adaptability. Switchgrass may be increased to the full allowable percentage for wildlife purposes. If four-winged saltbush is selected, plant 100% seeding rate on the acreage devoted to saltbush. Refer to Table 1 in this document and the standard and specifications for Pasture and Hay Planting (512) for information on introduced legumes. Required tree and shrub plantings will be selected from the "Shrub" section of Table 2 and planted in accordance with state standard and specifications for Tree/Shrub Establishment (612). The only approved trees are those listed in the Ecological Site Description for the soil type.

Distribution of Shrub Plantings - Each offer will have at least 5 individual planting locations. Planting root sprouting species in a "plus" pattern will facilitate fill-in of the mott.

Strip plantings should be placed as evenly across the offer as is practical considering factors such as prevailing winds, slope, contour, and soils to optimize erosion and wildlife benefits. Block plantings should be distributed throughout the field to provide optimum interspersions and benefits to targeted wildlife species.

Other - Where appropriate, prescribed burning will be utilized for wildlife benefits. Other opportunities to improve wildlife habitat will also be considered and included where appropriate in the CPO. Examples include water development, strip disking, mowing (except during nesting season) and food plots. Biologists of the Oklahoma Department of Wildlife should be consulted when developing plans for this CRP practice. Foresters with the Oklahoma Forestry Services Division should be consulted when developing trees and shrub planting plans.

CP4D Establishment of Permanent Wildlife Habitat (Whole Field Planting) Old World Bluestems are not eligible for CP4 practices.	Assigned Point Score
• Mixture of at least 4 species of either grasses, trees shrubs, forbs, or legumes planted in mixes, block, or strips, best suited for various wildlife species in the area.	40
• Mixture of at least 5 species of either of 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 are authorized.	50

Shrub Planting Specifications for CRP Plantings:

Bare Root Seedlings - All species except four-winged saltbush will be planted at the following density.

	Normal Field Planting <u>2</u> /		w/Weed Barrier <u>1</u> / <u>2</u> /	
	Minimum	Maximum	Minimum	Maximum
Shrubs per acre	272	544	136	544

1/ No cost share is available for weed barrier or drip irrigation for shrub plantings. However, participants who install either of these components at their own cost can reduce the minimum number of required shrub plantings to the levels shown in the Weed Barrier column.

2/ Spacing may be adjusted to take advantage of sites such as natural drains, terrace channels, etc., as long as the required shrubs per acre are planted. Typical spacings are: 272 trees per acre = 8' X 20', 544 trees per acre = 8' X 10', and 136 trees per acre = 8' X 40'.

Site Preparation - Areas to be established in shrubs shall be prepared for planting in accordance with the Tree/Shrub (612) standard and specifications. Additionally, plant in terrace channels, or in furrows to optimize moisture conditions. Also refer to Job Sheet JS 612 01, Tree/Shrub Establishment.

Distribution of Shrub Plantings - No more than 1 percent of the required 5 percent to be planted in shrubs will be planted in a single strip or block planting. Each offer will have at least 5 individual planting locations. Planting root sprouting species in a "plus" pattern will facilitate fill-in of the mott.

Strip plantings should be placed as evenly across the offer as is practical considering factors such as prevailing winds, slope, contour, and soils to optimize erosion and wildlife benefits. Block plantings should be distributed throughout the field to provide optimum interspersion and benefits to targeted wildlife species.

Establishment Criteria - Stands will be considered adequate when populations of 120 trees per acres have been established. Replanting will be required as needed to achieve 120 trees per acre. Stand evaluation for establishment shall be done at the end of the first growing season.

TABLE 2. WOODY SPECIES BEST SUITED FOR WILDLIFE (Introduced And Native)

SHRUB SPECIES	
American plum	Chickasaw (sand) plum
skunkbush sumac	chokecherry
western white honeysuckle	bush lespedeza (bicolor)
leadplant	indigobush
four-wing saltbush (Not on CP3)	hawthorn
autumn olive	deciduous holly
HARD MAST TREE SPECIES	
bur oak	pin oak
willow oak	water oak
Shumard oak	overcup oak
sawtooth oak	northern red oak
southern red oak	white oak
black walnut	pecan
blackjack oak	post oak
liveoak	hickory
Chinkapin oak	
SOFT/NON MAST TREE SPECIES	
hackberry	mulberry
green ash	lacebark elm
sugar maple	black locust
chittamwood	black cherry
red maple	redbud
sugarberry	

CP10 - Vegetative Cover (Grass Already Established)

CP10 Vegetative cover - grass already established. Score this item based on the original planted cover type. <u>1</u> /	Assigned Point Score
Solid stand of one to three species of introduced grasses {listed in the Pasture and Hay Planting (512) standard and specification.}	30
Solid stand containing at least 80% of one to three species of native grasses {listed in the Range Planting (550) standard and specification.}	40
A mixture of five or more native species containing at least 80% of 3 grasses that are listed in the Range Planting (550) standard and specification and at least 10% of one forb, shrub, or legume. No more than 2 percent can be annuals. Acceptable forbs, shrubs, and legumes are those listed on the Ecological Site Guides or the Range Site Technical Guide.	50
For stand enhancements, when forbs, shrubs and/or legumes are being added to an existing stand of native grasses according to Job Sheet JS-550-02, use 20% of the full seeding rate. No more than 4 percent can be annuals. (Refer to Example 3)	50

1/ Sampling Procedures on Existing CRP Grasses

If the participant feels that sufficient grasses, forbs, shrubs and/or legumes exist to meet the desired point requirements, although they were not seeded into the original plantings, the following sampling procedure is prescribed:

Sampling will consist of crossing each field with a frequency transect. One transect will be run along a north-south axis, the other along an east-west axis, roughly in the center of the field. Each transect should contain 100 observations with a 20" X 20" frame placed on the ground at each fifth step. After each line has been done, average the results to get overall frequency. In cases where fields are too small to accommodate the above procedure, adjust the steps between observations to achieve at least 30 observations per transect line. Retain transect results in the CRP contract folder, supporting records. All sampling must be done prior to the signing of the CRP-1 so that needed planting may be scheduled in the CPO.

CP11 - Vegetative Cover - Trees Already Established

Refer to the plant species information described under CP3A for stand enhancements. A 50 point cover of native grasses and/or shrubs may be planted within the 15 - 20 percent openings under practice CP4D.

CP11 Vegetative Cover - Trees - Already Established	Assigned Point Score
Solid stand of pine/softwood or solid stand of nonmast producing hardwood species.	10
Solid stand of a single hard mast-producing species.	20
Mixed stand (2 species) of hardwoods best suited for wildlife in the area.	30
Mixed stand (3 or more species) of hardwoods best suited for wildlife species in the area.	50
Pine/softwood established at, or thinned as needed, to provide 15 to 20 percent openings of native herbaceous and/or shrub plantings or natural regeneration best suited for wildlife in the area. Tree thinning, if required or recommended by the State Forester, must be completed within 3 years of the CRP-1 effective date. Trees must be removed from the site.	50

CP12 - Food Plots

This practice allows for the establishment and maintenance of annual and/or perennial wildlife food plots within CRP fields. In order to receive 5 points under CRP Ranking Factor N1b - Wildlife Enhancement, producers must establish food plots in accordance with the following guidance: Plant species will be selected from the approved list of plants best suited for use in wildlife food plots, Tables 3, 4, 5, and 6. Total acreage of CP12 shall not exceed 5 % of the acreage offered. The minimum acreage of food plots will be .25 acres or 2 percent of the contract acres, whichever is greater. The maximum acreage of individual food plots will be 5 acres. The size, location, and type(s) of plants in food plots should be based on the food requirements of the targeted wildlife species and not be immediately adjacent to one another. Food plots should provide plants that differ from those found on nearby cropland and hayland fields.

CP12 Wildlife Food Plot	Assigned Point Score
Wildlife food plots are small non-cost-shared plantings within a larger area. Wildlife food plots will never be the predominant cover.	NA

Approved List Of Plants Best Suited For Wildlife Food Plots (Cp12)

Table 3. Annual Plants (Warm Season) 1/

grain sorghum (milo, maize)	Proso millet
corn	German millet
mungbean	browntop millet
soybean	annual lespedeza (Korean, Kobe)
cowpeas	annual sunflower (black oil, graystripe, etc.)
Oriental pea (Game bird)	

Table 4. Annual Plants (Cool Season) 1/

wheat	hairy vetch
oats	Austrian winter peas
annual rye	pasture mix (small grains, rye, vetch)
	Sweetclover (biennial)

1/ Food plots will be established and maintained throughout the contract life. Refer to Technical Note Biology OK-24 and Wildlife Upland Habitat Management (645) standard for information on establishing plants for wildlife food.

Table 5. Perennial Plants (Warm Season) 2/

Illinois bundleflower	trailing wildbean
roundhead lespedeza	least snoutbean
tickclover	Maximilian sunflower
partridge pea (reseeding annual)	awnless bushsunflower
alfalfa	

Table 6 Perennial Plants (Cool Season)

white clover (biennial and perennial)	red clover (biennial and perennial)
---------------------------------------	-------------------------------------

2/ With the exception of alfalfa, all warm season perennial food plots will include a mixture of at least 2 species. Each species should compose at least 25% of the mixture. The seeding rate for each species will be based on their percentage in the food plot mix. Refer to Tables 1 of this technical note and Range Planting (550) Table 1 for information on establishing perennial plants best suited for wildlife. Alfalfa can be planted alone at the full seeding rate not to exceed 50 percent of the required acreage. It may also be planted in mixtures with other eligible plants. It should be noted that alfalfa is not a long-lived perennial. Stand re-establishment and/or conversion to annual food plants may be required on acreage planted to alfalfa during the period of a CRP contract. The remainder of required food plot acreage will consist of either approved annuals, approved cool season perennials, or a mix of approved warm season perennials meeting the requirements described in this footnote.

CP25 - Rare and Declining Habitat Restoration

CP25 Rare and Declining Habitat Restoration	Assigned Point Score
This practice is available only for the habitat types associated with the MLRAs shown below. Seeding or planting will be best suited for wildlife in the area. Planting will be based on the Restoration And Management Of Declining Habitats standard and specification (643).	50

Eligible Habitats for Restoration Under CP25.

Habitat Type	Associated MLRAs	Estimated Loss
Mixed Grass Prairie	77E, 78C, 82B, and 80A	>80%
Tall Grass Prairie	112	>90%

CRP Establishment Considerations

Establishment criteria will be evaluated on the base grass along with documentation that forbs and/or legumes were included in the planting. This is due to the nature of forbs and legumes to be somewhat cyclic based on weather events.

Planting Alternatives

Several choices for establishment of permanent cover are being offered due to the need to carry out weed control to establish the base grass, the availability of seeds, and the potential for forbs and legumes to be injured from carry-over cropland herbicides. These choices may change as program policy is revised. In all cases, the establishment of the base grasses is the primary objectives.

Some alternatives are:

- Plant all the grasses, forbs, and legumes together, using mowing or an approved herbicide that is compatible with forbs and legumes.
- Plant all the base grass the first year, use regular herbicides to establish, then drill the forbs and legumes the second year prior to March 31. Prior to planting the forbs and legumes, cover modification may be needed in the form of mowing or prescribed burning to allow the drill the place the forb and legume seed in direct contact with the soil. (Refer to Range Planting Job Sheets 550 02 & 03 for additional information.)

**EXAMPLE 1
 Calculation Worksheet For Seed Mixtures**

Species	Full PLS Seeding Rate	Percent Of Mix	Lbs. PLS/Ac For Each Species	Acres To Be Planted	Total PLS Lbs.
<u>GRASSES</u>					
big bluestem	6.0	20	1.2	60	72
little bluestem	3.4	15	.51	60	30.6
Indiangrass	4.5	20	.9	60	54
switchgrass	3.0	15	.45	60	27
sideoats grama	4.5	10	.45	60	27
blue grama	2.0	10	.2	60	12
<u>FORBS & LEGUMES</u>					
Illinois bundleflower	4.0	5	.2	60	12
partridge pea	4.0	2	.08	60	4.8
Maximilian sunflower	2.0	3	.06	60	3.6
		100			

EXAMPLE 2
Calculation Worksheet for Seed Mixtures

Species	Full PLS Seeding Rate	Percent Of Mix	Lbs. PLS/Ac For Each Species	Acres To Be Planted	Total PLS Lbs.
<u>GRASSES</u>					
orchard grass	6	30	1.8	60	108
bromegrass	12	30	3.6	60	216
<u>FORBS & LEGUMES</u>					
birdsfoot trefoil	4	35	1.4	60	84
cowpeas	40	5	2	60	120
		100			

EXAMPLE 3
Calculation for Stand Enhancement Plantings on Native Grasses

Species	Full PLS Seeding Rate	Percent Of Mix	Lbs. PLS/Ac Of Each Species	Acres To Be Planted	Total PLS Lbs.
<u>FORBS & LEGUMES</u>					
Illinois bundleflower	4.0	10	.4	60	24
partridge pea	4.0	4	.16	60	9.6
Maximilian sunflower	2.0	6	.12	60	7.2
		20			

Calculation Worksheet for Seed Mixtures

Species	Full PLS Seeding Rate	Percent Of Mix	Lbs. PLS/Ac Of Each Species	Acres To Be Planted	Total PLS Lbs.
<u>GRASSES</u>					
<u>FORBS & LEGUMES</u>					
Totals					

I certify that this mixture meets the NRCS FOTG standard and specification.

Certifying Individual _____

Title _____

Date _____

For the planting of woody plants, refer to the various Woodland Job Sheets.