

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

STATE OFFICE

STILLWATER, OKLAHOMA 74074-2655

**ECOLOGICAL SCIENCES TECHNICAL REFERENCES**      **FOR IN SERVICE USE ONLY**

BIOLOGY OK-27

October 9, 1997

Re: List of Forbs, Legumes, Trees, and Shrubs Best Suited for Wildlife Under the Conservation Reserve Program (CRP) Signup 16, and other considerations.

This technical note is to be used for guidance for CRP Signup 16. Much of the guidance is similar to Biology Technical Note OK-26, but additional information and clarifications have been provided for some of the plantings. This document should be studied carefully as some of the changes are very recent and could be significant on some offers.

Ranking Factor 1 (N1), Subfactor A, of the National Ranking Factor Worksheet for CRP assigns points based on wildlife benefits of established vegetative cover.

The attached lists of forbs, legumes, trees and shrubs have been determined to be best suited for wildlife on CRP lands in Oklahoma. These lists are used for practices CP1, CP2, CP3, CP3A, CP4B, CP4D, CP1 0, CP1 1, CP1 9, CP20 and CP23. The decision to assign points or include alternative species in a planting not included on this list will be made on a case-by-case basis. Submit requests to consider alternative species to the State Resource Conservationist.

This technical note is to be used for the CRP program for forb and/or legume guidance found in the range planting (550) and pasture planting (512) standard and specifications. This applies to new plantings and for cover enhancement of native plantings. Cover enhancement plantings are considered plantings into fully established grass stands. Cover enhancements must be drilled or otherwise planted in a manner that will place the seed in mineral contact with the soil. All plantings must be planned using the 100% full rate as the basis, and meet the standard and specifications for range seeding (550) or pasture planting (512) in all other aspects. All calculations for seed mixes will be based on multiplying the full seeding rate by the percentage desired in the mixture.

The attachment also details considerations for delayed planting.

Filing Instructions: File Biology OK-27 and attachments in the Technical Notes Manual under Biology. Make pen and ink addition to Biology Technical Note Index to list OK-27 dated October 9, 1997.

/s/ Mark Moseley acting for  
RONNIE L. CLARK State  
Conservationist  
Enclosures DIST  
A, F

## COVER FACTOR GUIDELINES FOR CRP SIGNUP 16

October 8, 1997

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

Consult Tables 1, 2 & 3 below for species selection and planting rates. Grass species and planting rates are listed in the Pasture and Hayland standard and specifications (512). When mixtures of are used, each grasses should be at least 10% of the composition. Refer to Example 2 & 3, seed mixture calculations. 1/ 2/

CPI Establishing permanent introduced grasses and legumes. Each base grass shall compose at least 10% of a mixture.	Assigned Point Score
Planting of one or two introduced grass species	10
A mixture of at least 3 species, comprising at least one introduced grass planted at a minimum of 60% of full seeding rate, with a forb and/or legume from Table 1. The forb and/or legume component must be a minimum of 30% of the total mixture. Up to 5% of the forbs and/or legumes can be annuals or biennials, the rest perennial. (Native forb and/or legumes can also be used in this category. The planting rates for natives shall be prorated from their full planting rate from Table 2 & 3 with no more than 5% annuals depending upon their percentage in the mix.)	30
Mixture of at least 4 species. The mixture must be at least 60% two cool season grasses which includes grasses such as orchardgrass, tall wheatgrass, pubescent wheatgrass, or brome grass where adapted. 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 biennial best suited for wildlife. (Native forbs and/or legumes can also be used in this category. The planting rates for natives shall prorated from their full planting rate, depending upon their percentage in the mix, from Table 2 & 3 with no more than 5% annuals.)	40
stand enhancement that includes overseeding of forbs and/or legumes into base grass according to Job Sheet, use 60% of the full seeding rates for the selected plants. Up to 10% of these forbs and/or legumes can be annuals or biennials.	30

Select legumes from Table I to be established with introduced grasses. Additional annual, biennial, or perennial legumes above the specification can be added to the mix at the landowner's option.

**Table 1. Legumes for CP1 Best Suited for Wildlife**

SPECIES	LIFE SPAN 3/	FULL SEEDING RATE PLS LBS./AC	INOCULUM TYPE 4/	AREA OF ADAPTATION
alfalfa (can be the grazing varieties of alfalfa's)	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 loamy 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 state, intolerant of low pH soils.
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.
- 3/ A = Annual B = Biennial P = Perennial
- 4/ These inoculum types are specific to each species.

**N1a Approved Cover Mixes for CP2, Permanent Native Grasses, Forbs, Legumes and/or Shrubs.**

Refer to Example 2, seed mixture calculations. All plantings under CP2 will be done according to the Range Planting (550) standard and specification or natives that are planted under the Pasture and Hayland (512) standard and specification.

<b>CP2 ESTABLISHMENT OF PERMANENT NATIVE GRASSES. (All Native plants)</b>	<b>ASSIGNED POINT SCORE</b>
Solid stand of one, two or three native grass species.	20
A mixture of at least four native species, containing at least 80% of two grasses and at least 10% of one forb, shrub and/or legume.	40
A mixture of five or more native species containing at least 80% of 3 grasses, and at least 10% of one shrub, forbs and/or legume listed in Table 2 & 3. No more than 2 percent can be annuals.	50
For stand enhancements of native stands according to Job Sheet JS-550-02 use 20% of the full seeding rate for the selected forbs, shrubs and/or legumes. No more than 4 percent can be annuals.	40 or 50

**TABLE 2. NATIVE LEGUMES - Best Suited for Wildlife (includes proper inoculant)**

<b>SPECIES</b>	<b>LIFE SPAN</b>	<b>FULL SEEDING RATE (PLS LB./AC)</b>	<b>INOCULUM TYPE (SPECIES SPECIFIC)</b>	<b>AREA OF ADAPTATION</b>
leadplant	perennial	2.0	Amorpha Spec 1	statewide
tephrosia	perennial	4.0	Tephrosia Spec 1	statewide
prairie clover	perennial	4.0	F	statewide
Illinois bundleflower	perennial	4.0	Desmanthus Spec 1	statewide
roundhead lespedeza	perennial	2.0	EL	eastern, western
tickclover	perennial	2.0	EL	statewide
trailing wildbean	perennial	2.0	Strophostyles Spec 1	statewide
western indigo	perennial	2.0	EL	statewide
catclaw sensitivebriar	perennial	2.0	Amorpha Spec I	statewide
prairie acacia	perennial	2.0	EL	statewide
partridge pea	annual	4.0	EL	statewide
least snoutbean	perennial	2.0	Rynchosia Spec 1	statewide

**TABLE 3. NATIVE FORBS Best Suited for Wildlife**

<b>SPECIES</b>	<b>LIFE SPAN</b>	<b>FULL SEEDING RATE (PLS LBS./AC)</b>	<b>AREA OF ADAPTATION</b>
Englemann daisy	perennial	4.0	statewide
Pitcher's sage	perennial	4.0	eastern, western
Maximilian sunflower	perennial	2.0	statewide
awnless bush sunflower	perennial	4.0	statewide
compass plant	perennial	2.0	eastern, western
gayfeather	perennial	4.0	statewide
black salsaparilla	perennial	2.0	statewide
pale echinacea	perennial	2.0	eastern

**CP-3 TREE PLANTING (PINE)**

Refer to State standard and specifications for range seeding (550), and the list of forbs and legumes described in this biology technical note under CP2 for native herbaceous plantings best suited for wildlife in pine plantings. Shrub plantings best suited for wildlife in pine plantings should be selected from the following list and planted in accordance with state standard and specifications for hedgerow planting (422) or tree planting (612).

**SHRUB SPECIES (native and introduced)**

American plum	Chickasaw (sand) plum
skunkbush sumac	chokecherry
bush honeysuckle	bush lespedeza (bicolor)
leadplant	indigobush
fourwing saltbush	hawthorn

**CP3a - HARDWOOD TREE PLANTING (Native)**

The following list of hardwood trees includes 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.

**HARD MAST SPECIES**

bur oak	pin oak
willow oak	water oak
Shumard oak	overcup oak
pecan	northern red oak
southern red oak	white oak
black walnut	live oak

**SOFT MAST SPECIES**

hackberry	mulberry
green ash	redbud
sugar maple	persimmon
chittamwood	cherry
Bois D' Arc	sugarberry
mulberry	red maple
black locust	

CP4B - PERMANENT WILDLIFE HABITAT (CORRIDORS) NON-EASEMENT

This practice includes a mixture of forbs and/or legumes, shrubs, and tree species best suited for wildlife in the area and native grasses. 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 and at least 30 percent of the cover shall be planted to woody species unless the identified wildlife species does not require woody species or woody species are not adapted. Select from the list below of species that are considered best suited for wildlife. Herbaceous plantings must include a combination of forbs and/or legumes totaling no less than 10 percent and no more than 30 percent of the full seeding rate. Of the minimum 10 percent forb and/or legume seeding requirement, at least 8 percent must be perennial natives. All other forbs and/or legumes (totaling from 12 to 22 percent), can include any combination of native and/or introduced forbs and legumes best suited for the targeted wildlife species (Table 1, 2, & 3). The grass species (totaling from 70 to 90 percent of their full seeding rate) will be selected from native grasses. Refer to the standard and specifications for Range Seeding (550) to determine the minimum and maximum percentages of each species to be included in the mixture and for information on areas of adaptability. Switchgrass may be increased to the full allowable percentage for wildlife purposes. Refer to the standard and specifications for Pasture Planting (512) for information on introduced forbs and legumes. Required tree and shrub plantings will be selected from the list provided in this technical note and planted in accordance with state standard and specifications for Hedgerow Planting (422) or Tree Planting (612). Biologists of the Oklahoma Department of Wildlife Conservation should be consulted when developing plans for this CRP practice.

APPROVED SHRUB LIST BEST SUITED FOR WILDLIFE (introduced and native)

SHRUB SPECIES

American plum	Chickasaw (sand) plum
skunkbush sumac	chokecherry
bush honeysuckle	bush lespedeza (bicolor)
leadplant	indigobush
fourwing saltbush	hawthorn
autumn olive	Japanese honeysuckle
deciduous holly	

HARD MAST 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
liveoak	hickory

SOFT MAST SPECIES

hackberry	mulberry
green ash	lacebark elm
sugar maple	persimmon
chittamwood	black cherry
Bois D' Arc	redbud
sugarberry	red maple
black locust	

## EXAMPLE

### CP4B PERMANENT WILDLIFE HABITAT (CORRIDORS) NONEASEMENT

#### HABITAT FOR BOBWHITE QUAIL (WESTERN OKLAHOMA - SAND SAVANNAS)

##### TREE AND SHRUB PLANTINGS

30 percent of area within corridors planted to tree and shrub species in rows containing hackberry (12 feet spacing), Chickasaw plum (4 feet spacing), and bicolor lespedeza (4 feet spacing) if adapted and needed for the identified species.

##### GRASS, FORB, AND LEGUME PLANTINGS

70 percent of the area within corridors seeded with a mixture that contains the following species:

<u>Species</u>	<u>Percent of Mix</u>	<u>Pounds per</u>
little bluestem	15	.51
big bluestem	15	.90
Indian grass	10	.45
Switchgrass	30	.90
tall dropseed	10	.10
Illinois bundleflower	5	.40
partridge pea	5	.40
trailing wildbean	5	.10
Maximillian sunflower	5	.10
Total	100	

#### CP4D - PERMANENT WILDLIFE HABITAT NON-EASEMENT

This practice will, as a minimum, include a mixture of herbaceous vegetation including forbs, and legumes best suited for wildlife in the area and native grasses,. Tree and shrub plantings will be included as 30% of this practice where needed to meet the specific needs of targeted wildlife species and where adapted to the site. Select from the attached lists of species that are considered best suited for wildlife. Herbaceous plantings must include a combination of forbs and/or legumes totaling no less than 10 percent of the full seeding rate and no more than 30 percent of their full seeding rate. Of the minimum 10 percent forb and/or legume requirement, at least 8 percent must be perennial natives. All other forbs and/or legumes (totaling from 2 to 22 percent) can include any combination of native and/or introduced forbs and/or legumes best suited for the targeted wildlife species (Table 1, 2, & 3). The grass species (totaling from 70 to 90 percent of their full seeding rate) will be selected from native grasses. Refer to the standard and specifications for Range Seeding (550) to determine the minimum and maximum percentages of each species to be included in the mixture and for information on areas of adaptability. Refer to the standard and specifications for Pasture Planting (512) for information on introduced forbs and legumes. Switchgrass may be increased to the full allowable percentage for wildlife purposes. Required tree and shrub plantings will be selected from the list provided in this technical note and planted in accordance with state standard and specifications for Hedgerow Planting (422) or Tree Planting (612). Where appropriate, prescribed burning will be utilized to maximize 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 will be consulted when developing plans for this CRP practice.

## EXAMPLE

### CP4D PERMANENT WILDLIFE HABITAT NONEASEMENT

#### HABITAT FOR WILD TURKEY AND DEER (EASTERN OKLAHOMA HEAVY BOTTOMLAND)

##### TREE AND SHRUB PLANTINGS

Sixty percent of area will be planted to a mixture of trees including equal amounts (15 percent) of pin oak, Shumard oak, pecan, and hackberry at a rate of 302 trees per acre (12 feet by 12 feet spacing).

Ten percent of the remaining open area will be planted in scattered one acre clumps with equal amounts of American plum, bush honeysuckle, Japanese honeysuckle, and sumac at a rate of 1210 shrubs per acre (6 feet by 6 feet spacing).

##### GRASS, FORB, AND LEGUME PLANTINGS

The remaining 30 percent of the area will be seeded with a mixture that contains the following species:

Species	Percent of Mix	Pounds per
little bluestem	10	.34
big bluestem	20	1.20
Indian grass	10	.45
Switchgrass	30	.90
Alfalfa	5	.20
White clover	5	.20
Illinois bundleflower	15	.60
Compassplant	5	.10
Total	100	

#### CP10 - VEGETATIVE COVER (NATIVE GRASS ALREADY ESTABLISHED)

To enhance an existing stand to earn a higher point score, use the CRP practice compatible with the points desired. For instance, if one wants to earn 40 points using introduced plants, the enhancement will be done under CP1. If one wants to earn 50 points, the enhancement will be done under CP2. For stand enhancements which consist of overseeding of existing native plantings with forbs and legumes, the planting dates are Feb. 1 - March 31 and are considered CP2 practices. It is not considered technically feasible to overseed introduced grasses without some treatment that reduces the competition from the base grasses. Refer to the various Job Sheets.

CP10 Vegetative cover - grass - already established. Score this item based on the original planted cover type.	POINT SCORE
Solid stand of one or two species of introduced grass (greater than 80% frequency)	10
Solid stand of one or two species of native grass (greater than 80% frequency)	20
Mixed stand, minimum of 3 species. At least one introduced or native grass (greater than 80% frequency), and a 10% frequency of native forbs, shrubs and/or legumes (up to 3% native annuals). Acceptable plants are those listed on the Range Site Technical Guide.	30
Mixed stand, minimum of 4 species. At least 2 native or introduced grasses and at least a 10% frequency of native forbs, shrubs and/or legumes (up to 3% native annuals). Acceptable plants are those listed on the Range Site Technical Guide.	40
Mixed stand, minimum of 5 species. At least 3 native grasses and at least a 10% frequency of native forbs, shrubs and/or legumes (up to 3% native annuals). Acceptable plants are those listed on the Range Site Technical Guide.	50

## CPI I - VEGETATIVE COVER - TREES ALREADY ESTABLISHED

Refer to the plant species information described under CP3A for stand enhancements.

## CP19 - ALLEY CROPPING

Refer to the plant species information described under CP1 and CP2 and CP3 of this technical note when planning this practice.

## CP23 - WETLAND RESTORATION

Farmed Wetland (FW), wetlands farmed under natural conditions (W), and Prior Converted Wetlands (PC) where hydrology is restored, can be re-vegetated through natural regeneration. All upland areas draining into the wetland and PC's where hydrology is not restored, shall be re-vegetated to a cover that meets a 50 point category (as listed in CP2. CP3A) trees, or shrubs listed in the technical note.

## ESTABLISHMENT CRITERIA

Due to the nature of forbs and legumes to be somewhat cyclic and weather dependent, establishment criteria will be evaluated on the base grass and the documentation that forbs and/or legumes were included into the planting.

## 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. These are:

- Plant all the grasses, forbs, and legumes together, use 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 01, 02 & 03 dated March, 1997 for additional information.)

**EXAMPLE 1  
CALCULATION WORKSHEET FOR SEED MIXTURES**

<b>SPECIES</b>	<b>FULL PLS SEEDING RATE</b>	<b>PERCENT OF MIX</b>	<b>LBS. PLS/AC FOR EACH SPECIES</b>	<b>ACRES TO BE PLANTED</b>	<b>TOTAL PLS LBS.</b>
<b><u>GRASSES</u></b>					
big bluestem	6.0	20	1.2	60	72
little bluestem	3.4	15	.51	60	30.6
Indiansrass	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
<b><u>FORBS &amp; LEGUMES</u></b>					
Illinois bundleflower	4.0		.2	60	12
partridge pea	4.0	2	.08	60	4.8
Maximillian sunflower	2.0	3	.06	60	3.6
		<b>100</b>			

**WOODY SPECIES** (Refer to Woodland Job Sheets)

**EXAMPLE 2  
CALCULATION WORKSHEET FOR SEED MIXTURES**

<b>SPECIES</b>	<b>FULL PLS SEEDING RATE</b>	<b>PERCENT OF MIX</b>	<b>LBS. PLS/AC FOR EACH SPECIES</b>	<b>ACRES TO BE PLANTED</b>	<b>TOTAL PLS LBS.</b>
<b><u>GRASSES</u></b>					
old world bluestem	2	70	1.4	60	84
<b><u>FORBS &amp; LEGUMES</u></b>					
alfalfa	10	15	1.5	60	90
sweetclover	5	5	.25	60	15
Illinois bundleflower	4	10	.4	60	24
		<b>100</b>			

**WOODY SPECIES** (Refer to Woodland Job Sheets)

**EXAMPLE 3  
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.
<b>GRASSES</b>					
orchard grass	6	30	1.8	60	108
bromegrass	12	30	3.6	60	216
<b>FORBS &amp; LEGUMES</b>					
birdsfoot trefoil	4	35	1.4	60	84
cowpea	40	5	2	60	120
		<b>100</b>			

**WOODY SPECIES** (Refer to Woodland Job Sheets)

**EXAMPLE 4  
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.
<b>FORBS &amp; LEGUMES</b>					
Illinois bundleflower	4.0	10	.4	60	24
partridge pea	4.0	4	.16	60	9.6
Maximillian sunflower	2.0	6	.12	60	7.2
		<b>20</b>			

**EXAMPLE 5  
CALCULATION FOR STAND ENHANCEMENT PLANTINGS ON  
INTRODUCED GRASSES**

SPECIES	FULL PLS SEEDING RATE	PERCENT OF MIX	LBS. PLS/AC OF EACH SPECIES	ACRES TO BE PLANTED	TOTAL PLS LBS.
<b>FORBS &amp; LEGUMES</b>					
alfalfa	10.0	25	2.5	60	150
sainfoin	20.0	25	5	60	300
sweetclover	5.0	10	.5	60	30
		<b>60</b>			

