

**AGRONOMY JOB SHEETS
INDEX**

<u>NO.</u>	<u>NAME</u>	<u>DATE</u>
AGRON-OK-2	Temporary Vegetative Ground Cover in Urban Areas	8/74
AGRON-OK-3	Permanent Vegetative Ground Cover in Urban Areas	8/74
AGRON-OK-4	Topsoiling Urban Areas	8/74
AGRON-OK-5	Tall Fescue	9/74
AGRON-OK-6	Permanent Drain in Urban Areas	3/76
AGRON-OK-7	Temporary Sediment Basin	3/76
AGRON-OK-8	Temporary Diversion	3/76
AGRON-OK-9	Bahiagrass in Conservation Farming	5/76
AGRON-OK-14	Establishing Bermudagrass from Rootstock in Conservation Farming	5/76
AGRON-OK-15	Establishing Bermudagrass from Seed in Conservation Farming	5/76
AGRON-OK-16	Weeping Lovegrass in Conservation Farming	5/76
AGRON-OK-19	Growing Sweetclover in Conservation Farming	7/76
AGRON-OK-20	Plant and Use Vetch in Conservation Farming	7/76
AGRON-OK-23	Determining Amount of Hay Mulch Used in Mulching Watershed Structures	8/76
AGRON-OK-24	Arrowleaf Clover in Your Conservation Pasture	3/77
AGRON-OK-25	Seedbed Preparation for Pasture Planting	9/77
AGRON-OK-26	Establishing Tall Fescue in Bermudagrass	9/77
AGRON-OK-27	Bermudagrass-Fescue Pasture Management	9/77
AGRON-OK-28	White Clover	7/80

**AGRONOMY JOB SHEETS
INDEX**

<u>NO.</u>	<u>NAME</u>	<u>DATE</u>
AGRON-OK-30	Inoculating Legume Seed	4/81
AGRON-OK-33	Pest Management	11/91
JS 311	Alley Cropping	05/04
JS 324 01	Deep Tillage	9/01
JS 327 01	Conservation Cover	12/00
JS 328 01	Conservation Crop Rotation	9/00
329A	Residue Management-- No-Till and Strip-Till	6/00
329B	Residue Management-- Mulch-Till	6/00
JS 329C 01	Residue Management-- Ridge Till	5/03
JS 330 01	Contour Farming	9/00
JS 332	Contour Buffer Strips	5/04
JS 340	Cover Crop	5/04
JS 344 01	Residue Management-- Seasonal	5/03
386	Field Borders	5/04
393	Filter Strip	5/04
412	Grassed Waterway/Vegetative Filter System	4/97
JS 484 01	Mulching	6/03
JS 512 01	Pasture & Hayland Planting--Adding Forbs and/or Legumes to Existing Stands of Introduced Warm Season Grasses such as OWB, Bermudagrass, or Weeping Lovegrass	12/00
JS 512 02	Pasture Planting--Old World Bluestem	6/98
JS 528A 01	Prescribed Grazing--Old World Bluestem	3/98

**AGRONOMY JOB SHEETS
INDEX**

<u>NO.</u>	<u>NAME</u>	<u>DATE</u>
JS 571 01	Soil Salinity Management – Nonirrigated	8/03
JS 585 01	Stripcropping	6/03
JS 589A 01	Cross Wind Ridges	6/03
JS 589C	Cross Wind Trap Strips	1/98
JS 590 01	Nutrient Management	2/03
JS 595	Pest Management	5/04
JS 601 01	Vegetative Barrier	9/01
JS 603	Herbaceous Wind Barrier	9/02
JS 609 01	Surface Roughening	11/03
JS 610 01	Toxic Salt Reduction	8/03
JS 633 01	Waste Utilization--Sampling Liquid Animal Waste	1/99
JS 633 02	Waste Utilization--Sampling Poultry Litter	2/99
JS 633 03	Waste Utilization	9/01

USDA Natural Resources Conservation Service (NRCS)**May, 2004**

Landowner _____

**WHAT IS ALLEY CROPPING**

Alley cropping is the planting of trees or shrubs in a set or series of single or multiple rows with agronomic, horticultural, or forage crops produced in alleys between the rows of woody plants.

PURPOSE

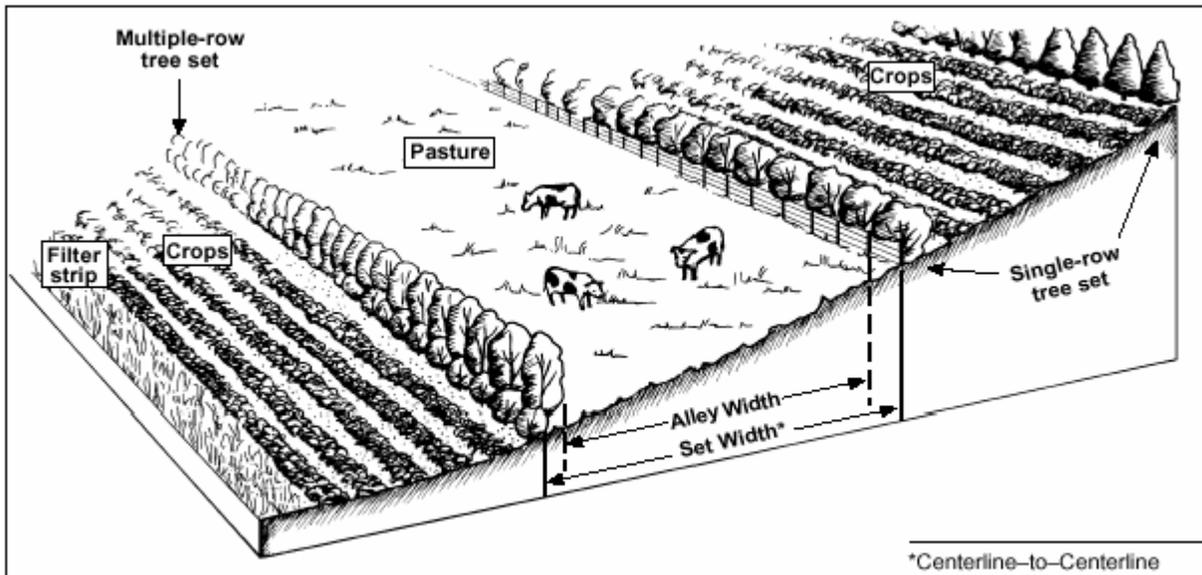
Alley cropping is used to:

- Produce tree and/or shrub products along with crops or forages
- Modify the microclimate for improved crop production
- Reduce surface water runoff and erosion
- Improve utilization and recycling of nutrients
- Reduce excess subsurface water
- Improve wildlife habitat

- Create habitat for biological pest management
- Improve crop diversity and economic returns
- Decrease offsite movement of nutrients or chemicals
- Enhance the aesthetics of the area
- Increase net carbon storage in the vegetation and soil
- Improve air quality

HOW IT HELPS THE LAND

Alley cropping adds diversity to the land and helps improve or optimize economic viability in an operation.



Alley width depends on purpose, tree canopy, crop sensitivity, crop rotation, crop or forage grown.

WHERE THE PRACTICE APPLIES

Alley cropping can be used on all lands where crops, forages and trees can be grown in combination. Alley cropping is used where improved economics or environmental conditions are desired over the existing farming practices. Alley cropping also provides excellent opportunities to improve wildlife habitat for some species by creating travel lanes connecting important habitat areas or infield cover.

WHERE TO GET HELP

For assistance in planning alley cropping systems, contact your local Natural Resources Conservation Service or your local Conservation District office.

APPLYING THE PRACTICE

Conservation Management System

Alley cropping is normally established as part of a total conservation management system to address the soil, water, air, plant, and animal resources. A conservation management system may include other practices such as conservation crop rotation, nutrient and pest management, and crop residue management. Proper grazing use and other forage practices for pasture and hayland need to be applied when forage crops are used. When alley cropping is used for erosion control, trees are planted on the contour in conjunction with a contour buffer strip.

Trees

Trees or shrubs are generally planted in a single- or multiple-row set or series. The spacing between sets is determined by the primary purpose of the alley cropping and the agronomic, horticultural, or forage crop grown. Woody plants are typically selected for their potential value for wood, nut, or fruit crops

and/or for the benefits they can provide to the crops grown in the alleys. Common tree species are black walnut, pecan, and green ash.

Crops

All traditional crops can be grown with alley cropping. The primary factors determining which crops can be grown are the canopy density and sunlight needs of the agronomic, horticultural, or forage crop.

Management

When row sets are spaced at relatively close intervals (40 feet or less), row crops can be grown for several years until the tree canopy begins to compete for sunlight. Management options include:

- Change the crop grown in the alleys from row crop to small grain to forage and potentially to tree plantation as the trees mature and the canopy shades the alley crop.
- Plan for a specific crop rotation and manage the trees to keep the canopy (competition for light) within the requirements of the crops grown.

Operation and maintenance

Trees must be periodically inspected and protected from damage so proper functioning is maintained. Care must be taken to utilize chemicals or chemical applications that are compatible both with the tree crop and the alley crop.

Specifications

Specifications are prepared in accordance with the Oklahoma NRCS Field Office Technical Guide. See practice standard Alley Cropping code 311.

Alley Cropping – Job Sheet

Landowner _____ Field number _____

Purpose (check all that apply)	
<input type="checkbox"/> Produce tree and/or shrub products (wood, nuts, berries, fodder, mulch, etc.) along with crops or forages	<input type="checkbox"/> Provide or enhance wildlife habitat
<input type="checkbox"/> Improve crop or forage quality and quantity by enhancing microclimatic conditions	<input type="checkbox"/> Create habitat for biological pest management
<input type="checkbox"/> Reduce surface water runoff and soil erosion	<input type="checkbox"/> Improve crop diversity, quantity, quality, and economic returns
<input type="checkbox"/> Improve utilization and recycling of soil nutrients	<input type="checkbox"/> Reduce movement offsite of nutrients or chemicals
<input type="checkbox"/> Reduce subsurface water quantity or alter water table depths	<input type="checkbox"/> Enhance the aesthetics of the are
	<input type="checkbox"/> Increase net carbon storage in the vegetation and soil

Layout
Alley width ¹ (ft): _____
Spacing between tree/shrub sets ² (ft): _____
Supplemental herbaceous cover width – erosive sites (ft): _____
Tree/shrub set orientations: ___Contour; ___North/South, ___East/West, ___Other (specify _____)

¹Distance available for herbaceous crops; set equal to multiple agricultural equipment widths. ²Distance from center of one set to center of the next set.

Woody Plant Materials Information				
Planting date: _____				
Species/cultivar by set and row number: (indicate set and row numbers on the job sheet sketch)	Kind of stock ³ :	Distance between plants within row (ft):	Total number of plants for row:	Distance (ft) from this row to next row ⁴ :
Set # 1: 1				
2				
3				
4				--
Set # 2: 1				
2				
3				
4				--

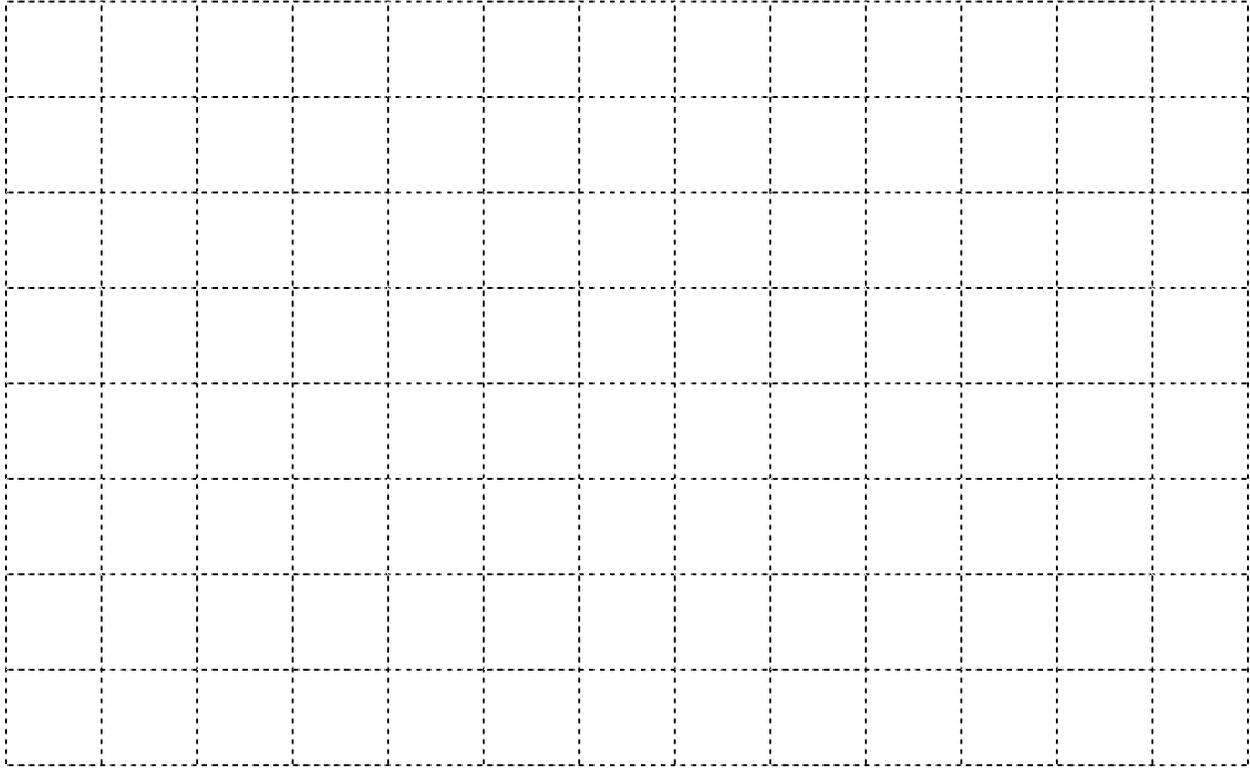
³Bareroot, COntainer, CUtting; include size, caliper, height, and age as applicable. ⁴Adjusted for width of maintenance equipment.

Temporary Storage Instructions
<i>Planting stock that is dormant may be stored temporarily in a cooler or protected area. For stock that is expected to begin growth before planting, dig a V-shaped trench (heeling-in-bed) sufficiently deep and bury seedlings so that all roots are covered by soil. Pack the soil firmly and water thoroughly. Additional requirements:</i>
Site Preparation
<i>Remove debris and control competing vegetation to allow enough spots or sites for planting and planting equipment. Prepare supplemental moisture materials for installation if required by trees and/or shrubs. Additional requirements:</i>
Planting Methods
<i>For container and bareroot stock, plant stock to a depth even with the root collar in holes deep and wide enough to fully extend the roots. Pack the soil firmly around each plant. Cuttings are inserted in moist soil with at least 2 to 3 buds showing above ground. Additional requirements:</i>
Operation and Maintenance
<i>Inspect alley cropping components periodically and protect from damage so proper function is maintained. Replace dead or dying tree/shrub stock and continue control of competing vegetation to allow proper establishment. Install and begin supplemental irrigation if required. Additional requirements:</i>

Alley Cropping – Job Sheet

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1"= _____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



Additional Specifications and Notes:

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

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Landowner _____

**DEFINITION**

Contour buffer strips are strips of perennial vegetation alternated down the slope with wider cultivated strips that are farmed on the contour. Contour buffers strips are usually narrower than the cultivated strips. Vegetation in strips consists of adapted species of grasses or a mixture of grasses and legumes.

PURPOSE

Contour buffer strips established on the contour can significantly reduce sheet and rill erosion. Strips slow runoff and trap sediment. Sediment, nutrients, pesticides, and other contaminants are removed from the runoff as they pass through the buffer strip. Buffer strips also provide food and nesting cover for wildlife.

WHERE USED

Contour buffer strips are used on cropland subject to sheet and rill erosion. They are most suitable on uniform slopes ranging from 4 to 8 percent. These narrow strips of permanent vegetation are not part of the normal crop rotation. Contour buffer strips are also an excellent filter for runoff and will help improve surface water quality. The practice is more difficult to establish on undulating to rolling topography because of the difficulty of maintaining parallel strip boundaries across the hill slope or staying within row grade limits.



Requirements for establishing contour buffer strips include a minimum buffer strip width, with strips placed along the contour and farming operations that follow the approximate contour grade. Cultivated strip widths are determined by such variables as slope, soil type, field conditions, climate, and erosion potential. Cultivated strip widths may be adjusted to accommodate machinery widths. Buffer strips can be used as turn areas if care is taken to minimize disturbance to soil and vegetation. Waterways or diversions are needed where runoff collects and concentrated flow erosion is a problem. Contour buffer strips can be established between terraces to enhance treatment of the hill slope. A ratio of cultivated width to buffer strip width of between 9:1 and 4:1 is desirable. For reducing sheet and rill erosion, buffer strip width must be at least 15 feet for grasses or grass-legume mixtures and at least 30 feet for legumes alone.

RESOURCE MANAGEMENT SYSTEM

Contour buffer strips are normally established as part of a resource management system for a conservation management unit. They are concurrently applied with other practices, such as residue management, conservation crop rotation, and contour farming. Cultivated strip widths are determined by such variables as slope, soil type, field conditions, climate, and erosion potential. Species to use for contour buffer strips depend on soil types, climate, and use by wildlife.

WILDLIFE

When planning for wildlife, adjust contour buffer strip widths and plant species to meet the needs of the target wildlife species. Increase widths to 30 feet or wider depending on the requirements for nesting and escape cover of the target wildlife species. Avoid mowing during nesting periods.

OPERATION AND MAINTENANCE

Mow buffer strips to maintain appropriate vegetative density and height for trapping sediment. Fertilize buffer strips according to soil

test results. Spot seed or renovate buffer strip areas damaged by herbicides, equipment, or unusual rainfall events. Redistribute sediment accumulations as needed to maintain uniform sheet flow along the crop-strip boundary.

SPECIFICATIONS

Site-specific requirements are listed on the specifications sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See Oklahoma Conservation Practice Standard Contour Buffer Strips, 332.

Contour Buffer Strips – Job Sheet

Landowner _____ Field number _____

Purpose (check all that apply)	
<input type="checkbox"/> Reduce sheet and rill erosion <input type="checkbox"/> Enhance wildlife (target species: _____)	<input type="checkbox"/> Reduce transport of sediment and other water-borne contaminants downslope, on-site or off-site

Layout	Strip 1	Strip 2	Strip 3	Strip 4
Cultivated strip width (feet)				
Buffer strip width (feet)				
Buffer strip length (feet)				
Area in buffer strip (acres)				

Plant Materials (species/cultivars)	Seeding Rate (lbs/acre of pure live seed)	Seeding Date
Strip 1:		
Strip 2:		
Strip 3:		
Strip 4:		

Soil Amendments and Fertilization	Strip 1	Strip 2	Strip 3	Strip 4
Lime (tons/acre)				
N Fertilizer – (lbs/acre)				
P ₂ O Fertilizer – (lbs/acre)				
K ₂ O Fertilizer – (lbs/acre)				

Site Preparation
Prepare a firm seedbed. Apply lime and fertilizer as indicated by soil testing. Additional requirements:

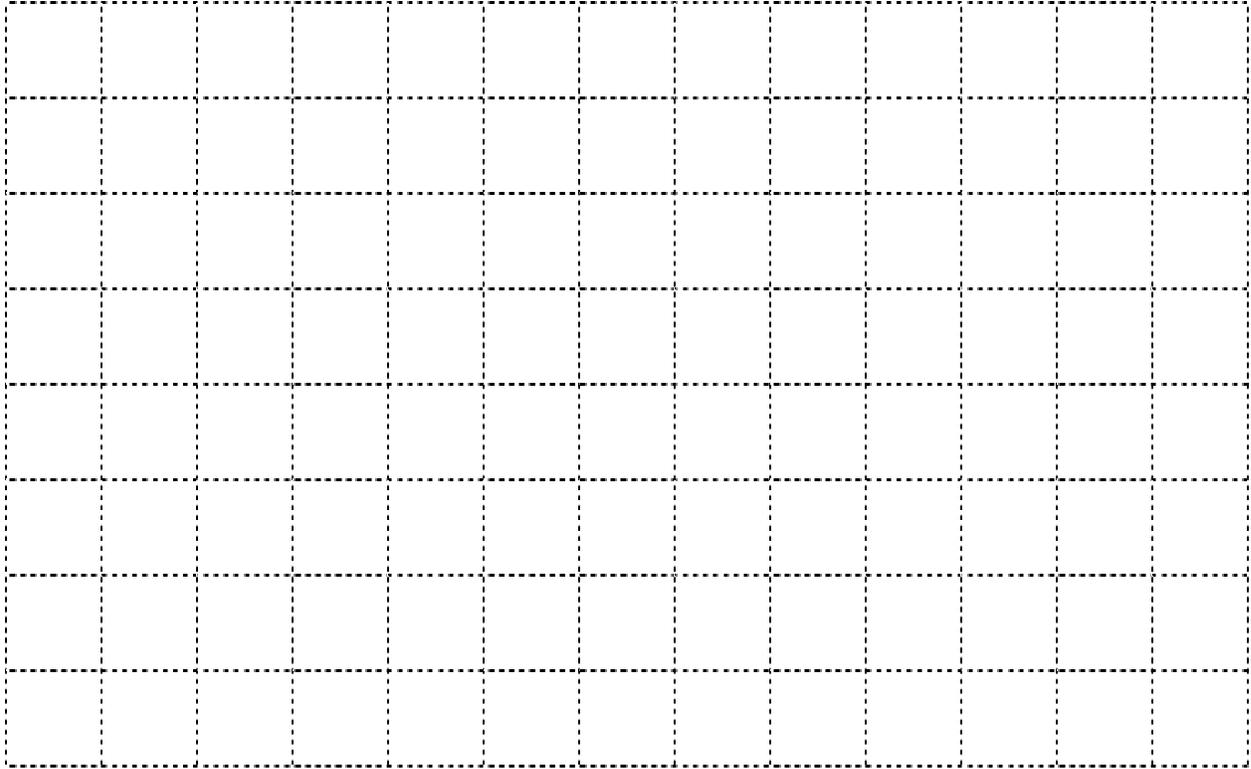
Planting Methods
Drill grass and legume seed _____ inches deep uniformly over area. Establish vegetation according to the specified seeding rate. If necessary, mulch newly seeded area with _____ tons per acre of mulch material. A small grain crop may be needed as a companion crop at the rate of _____ pounds per acre (clip or harvest before it heads out). Additional requirements:

Operation and Maintenance
Maintain original width and length of contour buffer strips. Harvest, mow, reseed, and fertilize as necessary to maintain plant density and vigorous plant growth. Inspect after major storms, remove trapped sediment, and repair eroding areas. Shut off pesticide sprayers when turning on a buffer strip. Additional requirements:

Contour Buffer Strips – Job Sheet

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1"=_____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



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Landowner _____

**WHAT IS A COVER CROP?**

A cover crop consists of grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

PURPOSE

- Reduce erosion from wind and water
- Sequester carbon in plant biomass and soils to increase soil organic matter
- Capture and recycle excess nutrients in the soil profile
- Promote biological nitrogen fixation
- Increase biodiversity
- Weed suppression
- Provide supplemental forage
- Soil moisture management

- Reduce particulate emissions into the atmosphere

HOW IT HELPS THE LAND

Cover crops applied to the land protect natural resources as well as provide food and forage. They are relatively an inexpensive way to accomplish a variety of resource improvements on the land.

WHERE THE PRACTICE APPLIES

Cover crops are applied on all lands that require temporary vegetative cover to protect natural resources. Cover crops can be used as a green crop or as mulch.

WHERE TO GET HELP

For assistance in planning a cover crop, contact your local Natural Resource Conservation Service or your local Conservation District office.

APPLYING THE PRACTICE

Select plant species, which provide appropriate protection for the natural resource.

Specific cover crops used for grass establishment purposes can be obtained from the Oklahoma Conservation Practice Standard Cover Crop (340).

Use soil testing to insure that proper fertility and pH conditions exist for the cover crop.

Soil moisture conditions need to be adequate to establish the cover crop.

Control pests as needed to insure proper cover crop development.

Herbicides used with cover crops should be compatible with the following crop.

Cover crops can be terminated by harvest, grazing, frost, mowing, tillage, and/or herbicides in preparation for the following crop. When viable seed

produced by the cover crop is undesirable, the cover crop will be terminated prior to seed maturity.

The specific Rhizobium bacteria for the selected legume will either be present in the soil or the seed will be inoculated at the time of planting.

Periodically, moisture conditions exist that will allow excess growth to be produced by the cover crop. This can inhibit proper seed to soil contact at planting time and impair seeding operations. The top growth can be removed by grazing, haying or mowing with a shredder to chop up residues.

Do not burn cover crop residue.

CONSIDERATIONS

Deep-rooted species used for cover crops provide greater nutrient recovery.

Consider using a combination of grass and legume crops for the management of excess nutrients in the soil profile.

Legumes are capable of fixing large amounts of atmospheric nitrogen. However, the legume plant uses most (approximately 75%) of the nitrogen fixed. Only if the plant is left unharvested and returned to the soil will the full nitrogen benefit be realized.

Cover Crop – Specifications Sheet

Purpose (Check all that apply)	
<input type="checkbox"/> Reduce erosion from wind and water	<input type="checkbox"/> Increase biodiversity
<input type="checkbox"/> Increase soil organic matter	<input type="checkbox"/> Provide weed suppression
<input type="checkbox"/> Manage excess nutrients in the soil profile	<input type="checkbox"/> Provide supplemental forage
<input type="checkbox"/> Promote biological nitrogen fixation	<input type="checkbox"/> Use for soil moisture management
<input type="checkbox"/> Reduce particulate emissions into the atmosphere	<input type="checkbox"/>

Location and Layout (Describe using field nos., legal, or locations in the field)

Establishment and Management					
Field no.	1	2	3	4	All Fields
Cover crop (species)					
Seeding date					
Seeding rate					
Fertilizer (N,P ₂ O ₅ ,K ₂ O,pH)					
Termination method					
Termination date					
Additional Management for Cover Crop:					

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Landowner _____



Photo credit: Dr. L.W. Burger, Jr., Mississippi State University

WHAT ARE FIELD BORDERS

A field border is a strip of permanent vegetation established at the edge or around the perimeter of a field.

PURPOSE

A field border is used to:

- Reduce soil erosion from wind and water,
- Protect soil and water quality
- Manage harmful insect populations
- Provide wildlife food and cover
- Improve air quality

HOW IT HELPS THE LAND

Field borders used with contouring, contour stripcropping, cross-slope farming patterns, or terraces eliminate the normal planting of end

rows or headlands in uphill and downhill directions. Field borders also provide turning areas and travel lanes for farm equipment operating in the field. They can also provide stable grass areas on the windward side of fields to trap blowing soil particles. In addition, field borders can provide forage production and improve farm aesthetics. They are most effective when used in combination with other agronomic or structural practices to provide conservation benefits

WHERE THE PRACTICE APPLIES

Field borders are located at the edges of crop fields and can connect to other buffer practices within fields such as grassed waterways. They may also apply to recreational land or on other land where agronomic crops are grown.



Field borders consist of adapted species of permanent grass, legumes, and/or shrubs. Native species are desirable. Field borders are more effective and provide more environmental benefits when planted around the entire field. Plants that attract beneficial insects can increase the population of beneficial insects that prey on harmful ones. Photo credit: Dr. L.W. Burger, Jr., Mississippi State University.

WHERE TO GET HELP

For assistance in planning field borders, contact your local Natural Resources Conservation Service or local Conservation District office.

APPLYING THE PRACTICE

Field borders can be a minimum of 20 to 100 feet in width depending on the purpose and objective. The borders need to be established to permanent grass and/or legumes. Any ephemeral gullies or rills present in the planned border area needs to be smoothed during seedbed preparation.

When borders are used to provide stable areas for controlling wind erosion, they need to be located on the upwind side of the field. Grass species that have an upright, stiff-stemmed growth habit work best for this purpose.

Field borders can enhance wildlife objectives. Consider using adapted native vegetative species that can provide food and cover for important wildlife. Increase width, if needed, to provide necessary protection for nesting animals from predators. Also increase width to protect wildlife if a portion of the field border will be used for equipment movement or

turn rows. Delay mowing of grassed area until after the nesting season for ground-nesting birds and animals. When managing field borders for wildlife, never disturb (such as mowing or disking) more than 50 percent of the field borders surrounding a field in any one year.

OPERATION AND MAINTENANCE

Inspect and repair field borders after storms to fill in gullies, remove sediment, reseed disturbed areas, and take other measures to ensure the effectiveness of the border. Do not mow or burn during the nesting season (normally May through July) to protect ground-nesting wildlife. In place of mowing, consider other vegetative management techniques, such as “wickbar” herbicide applicators or prescribed burning. In areas with adequate moisture, lightly disk the field border on a 2- or 3-year cycle to promote growth of native vegetation.

SPECIFICATIONS

Specifications are prepared in accordance with the Oklahoma NRCS Field Office Technical Guide and the Conservation Practice Standard Field Border (386).

Field Border – Job Sheet

Landowner _____ Field number _____

Purpose (check all that apply)	
<input type="checkbox"/> Reduce erosion from wind and water	<input type="checkbox"/> Management of harmful insect populations
<input type="checkbox"/> Soil and water quality protection	<input type="checkbox"/> Provide wildlife food and cover
<input type="checkbox"/> Increase carbon storage in biomass and soils	<input type="checkbox"/> Improve air quality

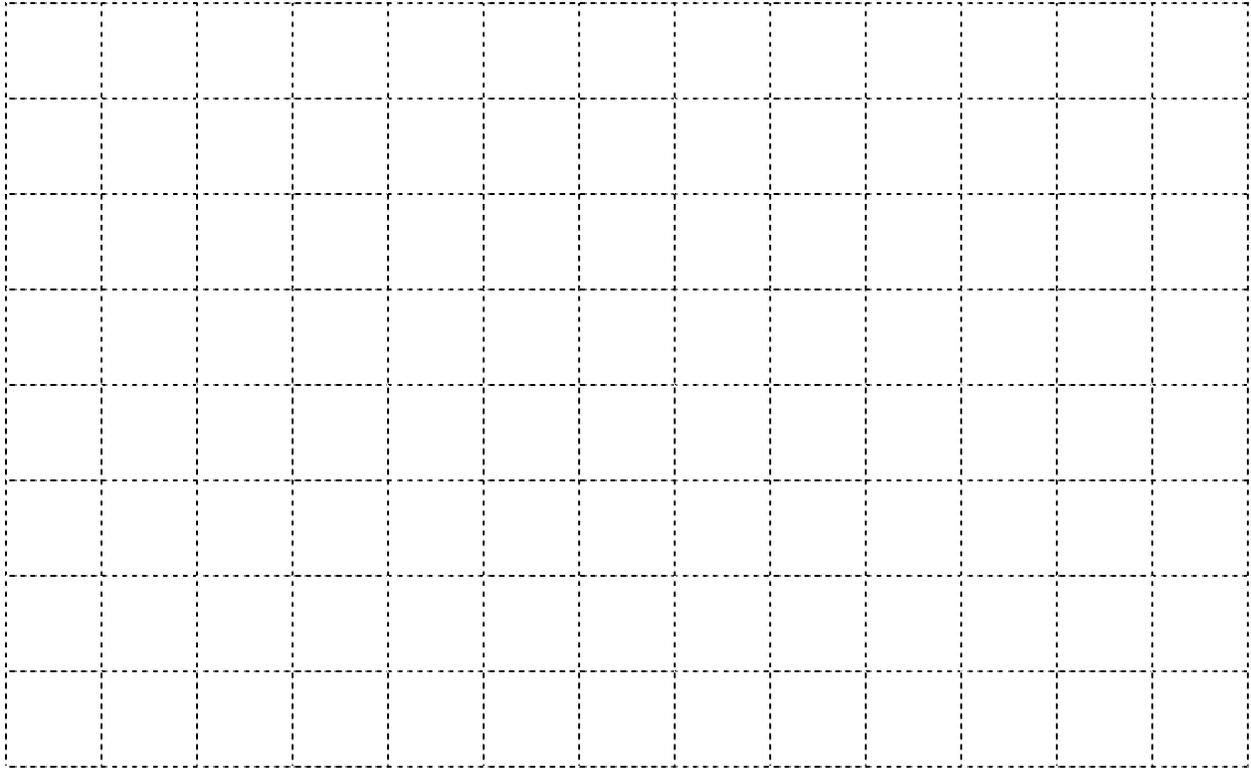
Layout	Field border 1	Field border 2	Field border 3	Field border 4
Border width (feet)				
Border length along edge of field (feet)				
Area (acres)				
Slope (%)				
Species #1				
Species #2				
Species #3				
Species #4				
Seeding rate (pure live seed – lbs/acre)				
Lime (tons/acre)				
N (lbs/acre)				
P ₂ O ₅ (lbs/acre)				
K ₂ O (lbs/acre)				

Site Preparation
<i>Prepare a firm seedbed. Apply lime and fertilizer as indicated by soil testing. Additional requirements:</i>
Planting Method
<i>Drill grass and legume seed _____ inches deep uniformly over area. Establish vegetation according to the specified seeding rate. Additional requirements:</i>
Operation and Maintenance
<i>Maintain original width and length of field border(s). Harvest, mow, reseed, and fertilize as necessary to maintain plant density and vigorous plant growth. Inspect after major storms, remove trapped sediment, and repair eroding areas. Shut off pesticide sprayers when turning on a field border. Additional requirements:</i>

Field Border – Job Sheet

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

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Landowner _____

**WHAT ARE FILTER STRIPS**

Filter strips are areas of herbaceous vegetation situated between cropland, grazing land, forest land, or disturbed land and environmentally sensitive areas. Sensitive areas include streams, lakes, wetlands, and other water bodies and areas susceptible to damage by water-borne pollutants, including sediment, particulate organics, sediment-adsorbed contaminants, and dissolved contaminants.

PURPOSE

Filter strips are used to:

- Reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in runoff
- Reduce dissolved contaminant loadings in runoff

- Serve as Zone 3 of a Riparian Forest Buffer (see Practice Standard 391)
- Reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in surface irrigation tail water
- Restore, create, or enhance herbaceous habitat for wildlife and beneficial insects
- Maintain or enhance watershed functions and values.

HOW IT HELPS THE LAND

Filter strips can be strategically located in a watershed to reduce and slow runoff and increase infiltration and groundwater recharge. They should be installed only below areas where sheet and rill erosion have been reduced to an acceptable level and where other practices are in place that slow runoff and contaminant delivery.



WHERE THE PRACTICE APPLIES

Filter strips are used on cropland, grazing land, forest land, or disturbed land. A filter strip is typically positioned at the down-slope edge of a field or disturbed area. Filter strips are normally used when adjacent areas have slopes gradients between 1 and 10 percent. They should not be part of the cropland rotation.

WHERE TO GET HELP

For assistance in planning filter strips, contact your local Natural Resources Conservation Service or Conservation District office.

APPLYING THE PRACTICE

Filter strips need to be established to permanent herbaceous vegetation consisting of a single species or a mixture of grasses, legumes and/or other forbs adapted to the soil, climate, nutrients, chemicals, and practices used in the current management system. Species of grass that have stiff stems and a high stem density near the ground surface work better in filter strips.

Filter strip widths are determined based on field slope percent and length, filter strip slope percent, erosion rate, amount and particle size distribution of sediment delivered to the filter strip, density and height of the filter strip vegetation, and runoff volume associated with erosion producing events. Contact your local conservation office for help in designing filter strip widths.

To the extent practical, place the filter strip on the approximate contour, with its upper edge ideally not exceeding a 0.5% gradient.

Concentrated flows of water entering the strip need to be dispersed so that sheet flow is achieved through the strip.

Filter strips can enhance wildlife objectives. Using native vegetative species can improve the wildlife values of a filter strip area as well as biodiversity.

OPERATION AND MAINTENANCE

Mow filter strips (and harvest forage when possible) as necessary to encourage dense vegetative growth. If established for wildlife habitat, avoid mowing during the nesting period of ground-nesting wildlife. Control undesirable weed species. Inspect and repair strips after storm events to fill in gullies, remove flow-disrupting sediment accumulation, reseed disturbed areas, and take other measures to prevent concentrated flow into and across the filter strip. Lime and fertilize to soil test recommendations to maintain a vigorous stand of vegetation. Exclude livestock and vehicular traffic from filter strips during wet periods of the year to reduce compaction that will limit infiltration. This type of traffic should be excluded at all times to the extent practical. Restoration is required if the filter strip has accumulated sediment to a point that it no longer functions effectively.

SPECIFICATIONS

Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See Oklahoma NRCS conservation practice standard Filter Strip (393).

Filter Strip – Job Sheet

Landowner _____ Field number _____

Purpose (check all that apply)	
<input type="checkbox"/> Reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in runoff	<input type="checkbox"/> Reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in surface irrigation tailwater
<input type="checkbox"/> Reduce dissolved contaminant loadings in runoff	<input type="checkbox"/> Restore, create, or enhance herbaceous habitat for wildlife and beneficial insects
<input type="checkbox"/> Serve as Zone 3 of a Riparian Forest Buffer (391)	<input type="checkbox"/> Maintain or enhance watershed functions and values

Layout	Strip 1	Strip 2	Strip 3
Strip width (feet)			
Strip length (feet)			
Area in strip (acres)			
Field slope (%)			

Plant Materials (species/cultivars)	Seeding Rate (lbs/acre of pure live seed)	Seeding Date
Strip 1:		
Strip 2:		
Strip 3:		

Soil Amend. and Fertilization	Strip 1	Strip 2	Strip 3
Lime per Soil Test (tons/acre)			
N Fertilizer per Soil Test – (lbs/acre)			
P ₂ O Fertilizer per Soil Test – (lbs/acre)			
K ₂ O Fertilizer per Soil Test – (lbs/acre)			

Site Preparation
Prepare a firm seedbed. Apply lime and fertilizer as indicated by soil testing. Additional requirements:

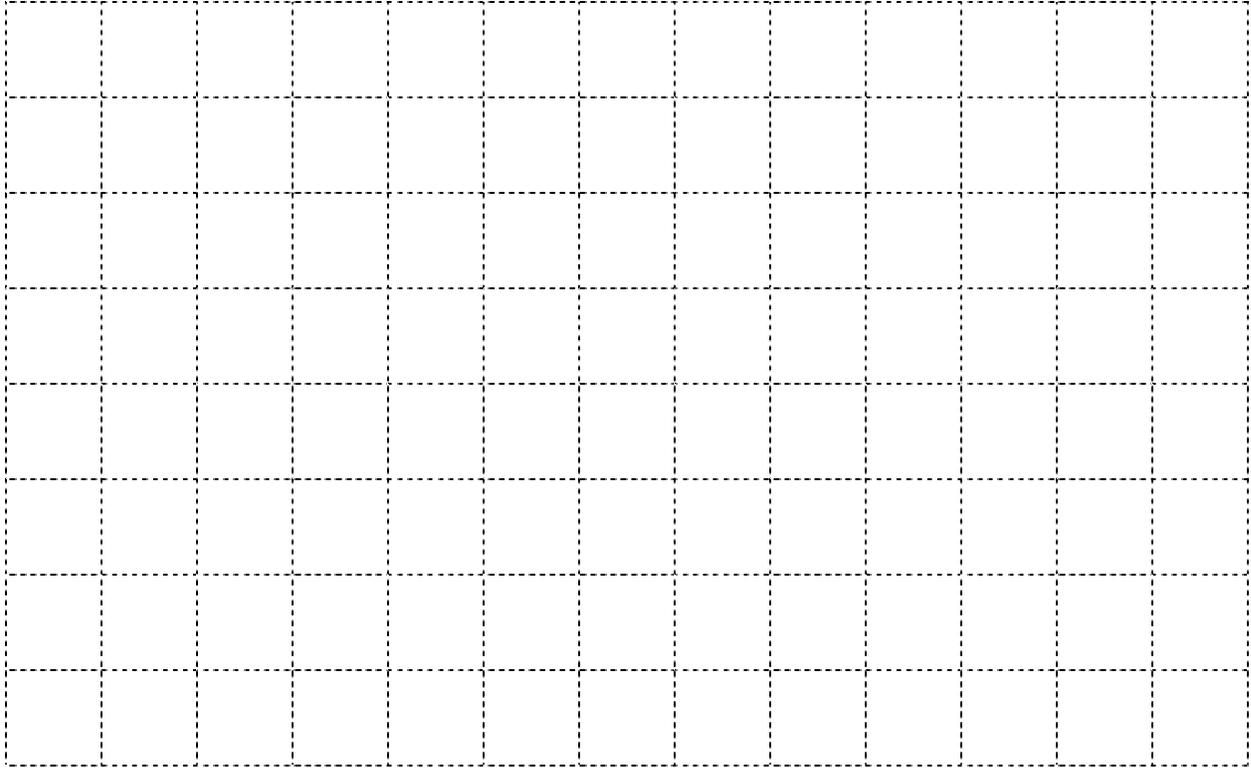
Planting Methods
Drill grass and legume seed _____ inches deep uniformly over area. Establish vegetation according to the specified seeding rate. If necessary, mulch newly seeded area with _____ tons per acre of mulch material. A small grain crop may be needed as a companion crop at the rate of _____ pounds per acre (clip or harvest before it heads out). Additional requirements:

Operation and Maintenance
Maintain original width and length of the filter strip. Harvest, mow, reseed, and fertilize as necessary to maintain plant density and vigorous plant growth. Inspect after major storms, remove trapped sediment, and repair eroding areas. Shut off pesticide sprayers when turning on a filter strip. Additional requirements:

Filter Strip – Job Sheet

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1"= _____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



Additional Specifications and Notes:

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To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250 or call 1-800-245-6340 (voice) or (202)720-1127 (TDD). USDA is an equal employment opportunity employer.

Landowner _____

**WHAT IS PEST MANAGEMENT**

Pest management is utilizing environmentally sensitive prevention, avoidance, monitoring, and suppression strategies, to manage weeds, insects, diseases, animals and other organisms that directly or indirectly cause damage or annoyance.

PURPOSE

Pest management is applied as part of a resource management system to:

- Enhance the quantity and quality of agricultural commodities.
- Minimize the negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans.

HOW IT HELPS THE LAND

Pest management systems need to include all methods of control for the pest and:

- Incorporate the use of Integrated Pest Management (IPM) systems.
- Any environmental risks associated with pest management.
- Mitigation alternatives to minimize environmental risks.

WHERE THE PRACTICE APPLIES

Pest management systems can be used in conjunction with other conservation practices such as a buffer strips, conservation crop rotations, irrigation water management and/or nutrient management on a site specific basis to address natural resource concerns. These practices can also be used to mitigate potential environmental risks associated with pest management activities.

APPLYING THE PRACTICE

Owners/operators are responsible for the proper implementation of pest management activities including the operation and maintenance of equipment.

- Review and update the pest management plan periodically in order to incorporate new IPM technology, respond to new cropping systems or pest changes, and avoid the development of pest resistance.
- Maintain mitigation techniques or practices identified in the pest management plan in order to ensure continued effectiveness.
- Develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers for individuals exposed to chemicals and the telephone number for the nearest poison control center.

The Oklahoma Poison Control Center telephone number is: 1-800-222-1222

The Oklahoma Poison Control Center's website also contains information for non-emergency uses: <http://www.oklahomapoison.org/>

The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon for non-emergency information is: 1-800-858-7384

Monday - Friday

6:30 a.m. to 4:30 p.m. Pacific Time

- All uncontained emergency spills in Oklahoma of more than ten (10) gallons liquid or twenty-five (25) pounds dry weight of pesticide concentrate or fifty (50) gallons of an application mixture (tank mix) shall be reported by a commercial applicator within 24 hours by telephone and by written notice within three (3) days to:

(405-702-5100)

Waste Management

Oklahoma Department of Environmental Quality

P.O. Box 1677

Oklahoma City, Oklahoma 73101-1677

and

(405-203-5180)

Pest Management Section

Oklahoma Department of Agriculture, Food and Forestry

2800 N. Lincoln Blvd.

Oklahoma City, Oklahoma 73152

The national 24-hour CHEMTREC telephone number for emergency spills is: 1-800-424-9300

- Follow label requirements for mixing/loading and setbacks from wells, intermittent streams, rivers, natural or impounded ponds, lakes, or reservoirs.
- Post signs according to label directions around sites that have been treated. Follow restricted entry intervals.
- Dispose of pesticides and pesticide containers in accordance with label directions and adhere to Federal, State, and local regulations. **Oklahoma Pesticide Laws and Rules for disposing of pesticides can be obtained on the following website:**

<http://www.oda.state.ok.us/laws-home.htm>

- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS).
- Calibrate application equipment according to the OSU Extension Agent's Handbook and/or the manufacturer recommendations before each seasonal use and with each major chemical change.
- Use regularly scheduled maintenance on equipment and replace worn nozzle tips, cracked hoses, and faulty gauges.
- Maintain records of pest management for at least two years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Record Keeping Program.
- Certified applicators in Oklahoma must keep the following records:

1. Time of application.
2. Place of each application.
3. Name and address of the applicator.
4. Name and address of person for whom applied.
5. Legal description of the land where applied:
 - May be a street address when properly marked.
 - Shall not be a Post Office Box address.
6. Date of application.
7. Pesticide tank mix concentration.
8. Dilution rate for mixing.
9. Total quantity of pesticide used:
 - Total amount of pesticide concentrate used.
 - Total amount of pesticide tank mix used.
10. Complete trade name of pesticide product used.
11. EPA registration number of pesticide product used.
12. EPA establishment number of pesticide product used.
13. Any lot or batch number appearing on the pesticide product used.
14. Target pest for the application.
15. Site where the pesticide was applied.
16. Restricted Entry Interval as stated on the product label.
17. A copy of the pesticide product label as it appears on the container.
18. Copies of any contracts issued.
19. Other information as required by the Board.

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**WOODLAND JOB SHEETS
INDEX**

<u>NO.</u>	<u>NAME</u>	<u>DATE</u>
4-31867	Protecting Shade Trees During Construction	07/72
4-R-28310	Forest Crops are Farm Crops	7/69
WOOD-OK-2	Screening with Trees and Shrubs	8/74
WOOD-OK-4	Woodland Proper Grazing Use	11/90
WOOD-OK-9	Operating Your Drip Watering System	6/82
WOOD-OK-10	Windbreak Planting Tips	6/80
JS 342 01	Critical Area Planting Planting Trees and Shrubs	3/98
JS 666 01	Forest Stand Improvement--Forest Stand Improvement	3/98
JS 612 01	Tree/Shrub Establishment-- Tree/Shrub Planting	3/98
JS 612 02	Tree/Shrub Establishment-- Checking Soil Moisture Available to Trees	3/98
JS 660 01	Tree/Shrub Pruning--Pruning Trees and Shrubs	3/98
JS 380 01	Windbreaks/Shelterbelts--Windbreaks for Livestock	5/04
JS 380 02	Windbreaks/Shelterbelts-- Farmstead Windbreaks	3/98
JS 380 03	Windbreaks/Shelterbelts-- Field Windbreaks	3/98
391	Riparian Forest Buffer	1/98

Landowner _____

Windbreaks for Livestock



WHAT ARE WINDBREAKS FOR LIVESTOCK?

Windbreaks for livestock are plantings of single and/or multiple rows of trees and shrubs designed to benefit livestock. A well designed and maintained windbreak protects livestock from the cold winter wind and hot summer sun and provides economic benefits to the landowner over the long term. Properly placed windbreaks can provide benefits to feedlots, pastures, and calving areas.

WHAT ARE THE BENEFITS TO LIVESTOCK?

All classes of livestock must maintain their body temperature within a relative narrow range or comfort zone. A properly designed windbreak can protect livestock from cold winter winds and still reduce heat

stress to animals in the summer by providing shade and allowing wind circulation. These benefits will minimize the energy livestock must expend to maintain their body temperature. Livestock producers will accrue significant benefits through reduced feed requirements, increased weight gains, improved birthing rates, and improved animal health.

WHERE THE PRACTICE APPLIES:

Windbreaks apply to any area where livestock concentrate such as feedlot, feeding and watering facilities, and birthing (calving) areas.

WHERE TO GET HELP

For assistance in planning and establishing windbreaks for livestock, contact your local Natural Resources Conservation Service (NRCS) and Conservation District.

REQUIREMENTS OF WINDBREAKS FOR LIVESTOCK

In Oklahoma, Northerly winds are predominant during the winter and early spring. Windbreaks should be designed to be located on the north and west sides of livestock operations. This provides a protected area for livestock on the south and east sides of the windbreak. Windbreaks on the south should be avoided as they can block summer breezes, increasing health stress.

The windbreak design shall meet the planned objectives within a 20 year period. It should provide protection from at least two or possibly three directions.

Windbreaks reduce wind speeds to the downwind side 10 times the height of the tallest windbreak row. The amount of wind reduction depends on the density of the windbreak. The inclusion of one or more rows of coniferous (evergreen) trees and also the addition of shrub rows will increase density thus reducing wind speed.

The windbreaks should be of such size and design that livestock will comfortably fit into the protected area. Listed are some estimated space requirements for cattle:

Type of Animal		Minimum Square Feet per Head
Beef	Feeders	250
	Cows	300
	Calves	200
Dairy	Cows	400
	Calves	200

For windbreak plan and design, see Oklahoma Job Sheets 380 02 and 380 03.

APPLYING THE PRACTICE

The practice is considered applied when the windbreak is established according to the above recommendations and the objectives are met.

OTHER CONSIDERATIONS

Below are some things to consider when planting a windbreak:

- Avoid planting windbreaks where they will interfere with structures or utilities.
- The planting will need to be protected from adverse impacts such as livestock damage and fire.
- Windbreaks will be located so that snow deposition will not adversely impact the area to be protected.
- Wildlife needs should be considered when selecting tree and shrub species.
- Use of windbreaks as screens (visual, noise, smell, dust, etc.)
- Aesthetics
- Spacing of rows to accommodate width of equipment needed for maintenance.

MAINTAINING THE PRACTICE

Refer to Oklahoma job sheet JS 660 01 Tree/Shrub Pruning for individual tree maintenance. Replace trees that die so the function of the windbreak will be maintained. Livestock must be excluded for the life of the windbreak.

Table 1. Critical temperatures for beef cattle are determined in part by the condition of the coat. Below the critical temperature, livestock must expend more energy in order to keep warm.

Coat Description	Critical Temperature
Summer coat or wet	59°F
Fall coat	45°F
Winter coat	32°F
Heavy winter coat	18°F

Adapted from D.R. Ames, Kansas State University

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