United States Department of Agriculture
Natural Resources Conservation Service

Arkansas Agronomy Technical Note 1

Conservation Practice Seeding Recommendations

February 1, 2014

Introduction

This technical note may be used to develop site specific recommendations for Arkansas NRCS implementation of vegetative conservation practices. The Arkansas NRCS Practice Standards for which this Agronomy Technical Note 1 should include: Conservation Cover (327), Cover Crop (340), Critical Area Planting (342), Field Border (386), Firebreak (394) Filter Strip (393), Forage and Biomass Planting (512), Silvopasture (381), Upland Wildlife Habitat Management (645), and Wetland Wildlife Habitat Management (644), Vegetative Barrier (601). Refer to the standards in the Field Office Technical Guide for specific practice purposes and requirements.

Species Selection

The following considerations should be evaluated before a vegetative species is recommended as an alternative in the planning process: 1) Landowners objective; 2) Plant Hardiness Zone; 3) Soil Type; 4) Areas of Adaptation; 5) Drainage Adaptations; 6) Drought Tolerance; 7) Life Span; 8) Seasonal Production; 9) Management; 10) Major uses; 11) Anti-Quality Factors; and 12) Plant Characteristics.

Cultivar Recommendations

The recommendations of plant cultivars should be provided from qualified individuals who are knowledgeable of the selected species to be planted. Due to the variety of different cultivars and new cultivars made available to the public, this document will not provide specific recommendations on cultivars for plant species. Potential resources to provide cultivar recommendations include, but are not limited to: NRCS personnel, University of Arkansas Cooperative Extension Service, and Boonville Plant Materials Center.

Seeding Rates

Seeding rates are based on the minimum amount of seed necessary to provide vegetative cover in a reasonable amount of time. Several factors influence the seeding rate: 1) seed quality; 2) seedbed condition; and 3) method of seeding. The pure stand rates in this document are the minimum rates for planting a single species stand into a seedbed appropriate for the situation.

Planting Dates

The planting dates provided in this document are in broad ranges resulting from typical weather conditions in Arkansas. Soil moisture and temperature are the two most important elements when considering planting dates. However, unpredictable weather events including abnormal precipitation and unseasonable weather temperatures often result in evaluation of the planting dates for a given year and location. Any variation from this document's planting dates should be reviewed and approved by the appropriate specialist for the discipline.

Seed Information

Seed purchased on a PLS seed basis allows the buyer to know the quality of the seed and make necessary adjustments to the PLS seeding rates. Seed information should be obtained from seed tag(s).

Seed Quality

Individuals should be informed on the importance of seed quality. Two components of seed quality include percent purity and percent germination. These two components directly affect the amount of bulk seed that an individual may have to purchase and apply.

Ultimately, the amount of pure live seed should be within the acceptable seeding rates of the identified plant species. NRCS staff should inform individuals that seed should be purchased and planted on a pure live seed basis unless the practice standard states otherwise. It is recommended that seed is purchased within 9 months of seed testing. The appropriate job sheets should document the amount of pure live seed that should be purchased. Below is the formula to determine the amount of bulk seed that is needed to meet the required pure live seed rate:

$$\text{Pounds of Bulk Seed} = \frac{\text{Pounds of Pure Live Seeds}}{\%\ \text{Purity} * \%\ \text{Germination}}$$

Drainage Adaptation

This document provides the drainage adaptation characteristics for each plant species. The drainage adaptation characteristics are identified as the following: Excessive-Well, Well, Well-Poor, Poor, and Excessive-Poor. NRCS staff may view the specific sites drainage class in the web soil survey. Table 2 shows a comparison of the plant drainage adaptation that is noted in the Agronomy Technical Note 1 and the soil drainage classes that is defined in the soils survey manual:

Table 2 - Comparison of Plant Drainage Adaptation Characteristics and Soil Drainage Classes

Plant Drainage Adaptation Characteristics	Soil Drainage Classes
Excessive – Well	Excessively Drained
	Somewhat Excessively Drained
Well	Well Drained
	Moderately Well Drained
Well – Poor	Somewhat Poor Drained
Poor	Poorly Drained
Excessive - Poor	Very Poor Drained

Plant Hardiness Zones

The USDA Plant Hardiness Zone (PHZ) map provides the average annual minimum temperatures to provide a general basis of which plants are most likely to thrive at a location. Information on the plant hardiness zones is included in this document. These are general recommendations for the most suitable areas of adaptation.

Plant Classification

This document provides the plant classifications into the following categories: 1) Introduced Annual Cool Season Grass, 2) Introduced Annual Cool Season Legumes, 3) Introduced Perennial Cool Season Grass, 4) Introduced Perennial Cool Season Legume, 5) Introduced Annual Warm Season Grass, 6) Introduced Annual Warm Season Legume, 7) Introduced Perennial Warm Season Grass, 8) Introduced Perennial Warm Season Legume, 9) Native Perennial Warm Season Grass, 10) Native Perennial Cool Season Grass, 11) Native Annual Warm Season Legume, 12) Native Perennial Warm Season Legume and 13) Native Forbs.

Conservation Practice Supplements

The following conservation practices have additional technical guidance to be followed:

Native grass plantings and/or mixtures should be completed according to 1) Practice Standards and Specifications, 2) Arkansas NRCS Agronomy Technical Note 1, and 3) Arkansas NRCS Native Grass Fact Sheet.

Cover Crop (340) should be completed according to the Cover Crop technical note.

Legume Inoculation

Use pre-inoculated legume seed or inoculate legume seed with the proper inoculant before seeding, unless the desired legume is already present in stand. Use *R. meliloti* for alfalfa; *R. trifolii* for alsike, arrowleaf, ball, berseem, crimson, red rose, subterranean and white clover; *B. japonicum spp*. for alyce clover, cowpea, lespedeza and soybean; *R. leguminosarum* for vetch and winter pea; and *R. loti* for bridsfoot trefoil.

Wildlife Specific Recommendations

Options for firebreaks:

1) Pure clover planting where wildlife is the primary concern. Clover mixes are preferable. Mixes of both perennial grasses and clovers are the best alternative.
2) In North Arkansas, orchardgrass and clover are a viable wildlife alternative.
3) Fescue clover mixes should only be used where soil erosion is a major concern.

Introduced Annual Cool Season Grass

Species	Solid Stand Seeding Rate		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Barley	80-125	50-100	09/01-12/01	1 to 2	Well	X	X	X	X
Oats	110-140	80-110	09/01-12/01, 02/01-04/01	1 to 2	Well	X	X	X	X
Rye	90-160	60-120	09/01-12/01	1 to 2	Well-Poor	X	X	X	X
Ryegrass	20-30	15-20	03/01-04/15, 09/01-11/01	0 to 1/2	Well-Poor	X	X	X	X
Triticale	60-110	50-90	09/01-12/01	1 to 2	Well-Poor	X	X	X	X
Wheat	75-150	60-120	10/01-11/15	1 to 2	Well	X	X	X	X

Introduced Annual Cool Season Legumes

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Clover, Arrowleaf	8-10	5-7	09/15-10/15	0 to 1/2	Well	X	X	X	X
Clover, Ball	3-4	2-3	09/15-10/15	0 to 1/4	Excessive-Poor				X
Clover, Berseem	15-25	12-15	09/01-10/01	1/4	Well-Poor				X
Clover, Crimson	20–30	15 – 20	09/01-10/15	1/4	Well	X	X	X	X
Clover, Rose	12-20	10-12	09/01-11/01	1/4	Excessive-Well	X	X	X	X
Clover, Subterranean	15 – 20	12 – 15	09/15-11/01	1/4	Well				X
Sweetclover	15 – 20	5 - 15	09/01-10/01	1/4	Excessive-Well	X	X	X	X
Vetch, Common	20 – 25	15 – 20	09/01-11/01	1/2 to 3/4	Well	X	X	X	X
Vetch, Hairy	20 – 25	15 – 20	09/01-11/01	1 to 2	Well	X	X	X	X

Introduced Perennial Cool Season Grass

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Bluegrass, Kentucky	10-15	8-10	02/01-04/01, 09/01-11/01	1/8 to 1/4	Well	X	X		
Bromegrass, Smooth	15-20	10-15	02/01-4/01, 09/01-11/01	1/4 to 1/2	Well	X	X		
Canarygrass, Reed	8-10	5-8	09/01-10/01	1/4 to 1/2	Excessive-Poor	X			
Fescue, Tall	20-25	15-20	03/01-04/01, 09/01-11/01	1/4 to 1/2	Excessive-Poor	X	X	X	
Orchardgrass	12-15	10-12	03/01-04/01, 09/01-11/01	1/4 to 1/2	Well	X	X		
Timothy	10-12	6-10	09/01-11/01	1/4 to 1/2	Well-Poor	X			

Introduced Perennial Cool Season Legume

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Alfalfa	18-25	15-20	03/01-04/01, 09/01-10/01	1/4	Well	X	X	X	X
Clover, Alsike	8-12	4-10	09/01-11/01	1/4	Well-Poor	X	X		
Clover, Red	12-15	10-12	03/01-04/01, 09/01-10/01	1/4 to 1/2	Well	X	X	X	X
Clover, White	2-4	2-3	2/15-03/15, 09/15-10/15	0 to 1/4	Well-Poor	X	X	X	X
Trefoil, Birdsfoot	4-6	4-5	09/15-10/15	0 to 1/4	Excessive-Poor	X			

Introduced Annual Warm Season Grass

Species	Solid Stand Seeding Rate		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Crabgrass	4-6	2-4	03/01-05/01	1/8 to 1/4	Excessive-Well	X	X	X	X
Millet, Browntop	20-30	15-20	04/01-08/15	1/2 to 1	Excessive-Well	X	X	X	X
Millet, German	20-30	15-20	04/01-08/15	1/4 to1/2	Well	X	X	X	X
Millet, Japanese	20-30	10-15	04/01-08/15	1/4 to 1/2	Well-Poor	X	X	X	X
Millet, Pearl	30-40	20-30	05/01-07/15	1/2 to 1	Excessive-Well	X	X	X	X
Sorghum	25-30	15	05/01-07/15	1 to 2	Excessive-Well	X	X	X	X
Sorghum-Sudangrass	30-40	20-35	05/01-07/15	1 to 1-1/2	Excessive-Well	X	X	X	X
Sudangrass	30-40	20-35	04/01-08/15	1 to 1-1/2	Excessive-Well	X	X	X	X

Introduced Annual Warm Season Legumes

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Alyce clover	15-20	10-15	05/01-06/15	1/4 to 1/2	Well			X	X
Cowpea	45-60	25-30	05/01-07/01	1 to 1-1/2	Well	X	X	X	X
Lespedeza, Striate	20-25	15-20	03/01-04/15	1/4 to 1/2	Excessive-Well	X	X	X	X
Lespedeza, Korean	20-25	15-20	03/01-04/15	1/4 to 1/2	Excessive-Well	X	X	X	X
Soybean	60-120	60-90	04/01-06/01	1 to 1-1/2	Well	X	X	X	X

Introduced Perennial Warm Season Grass

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Bahiagrass	15-18	12-15	11/01-06/01	1/4	Excessive-Well				X
Bermudagrass Seed	6-8	4-6	04/01-06/01	1/4	Excessive-Well	X	X	X	X
Bermudagrass Sprigs	Sprigged at 16-24 Bu					X	X	X	X
Bluestem, Old World	3-5	2-3	04/01-06/01	1/4	Excessive-Well	X	X		
Dallisgrass	15-18	12-15	05/01-06/15	1/4	Excessive-Well			X	X
Lovegrass, Weeping	3-5	2-3	03/01-05/01	1/4	Excessive-Well	X	X	X	X

Introduced Perennial Warm Season Legumes

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Lespedeza, Bicolor	9	7	04/15-06/01	1/2 to 1	Well	X	X	X	X
Lespedeza, Sericea	30	20	03/30-06/01	1/4	Well	X	X	X	X

Native Perennial Warm Season Grass

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Bluestem, Big	8	5	12/15-05/01	1/4	Well	X	X	X	X
Bluestem, Little	8	5	12/15-05/01	1/4	Well	X	X	X	X
Gamagrass, Eastern	15	10	12/15-05/01	1/4	Well-Poor	X	X	X	X
Indiangrass	8	5	12/15-05/01	1/4	Well	X	X	X	X
Switchgrass	8	5	12/15-05/01	1/4	Well	X	X	X	X

Native Perennial Cool Season Grass

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Wildrye, Virginia	12	8	10/15-04/01	1/2 to 3/4	Excessive-Well	X	X	X	X

Native Annual Warm Season Legume

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Pea, Partridge	15	10	03/01-05/01	1/4 to 3/4	Excessive-Well	X	X	X	X

Native Perennial Warm Season Legume

Species	Solid Stand Seeding Rate (PLS)		Seeding Dates	Seeding Depth (inches)	Drainage Adaptation	Area of Adaptation Plant Hardiness Zone			
	Broadcast	Drilled				6b	7a	7b	8a
Bundleflower, Ill	15	13	12/01-05/31	1/4 to 3/4	Excessive-Well	X	X	X	X

Native Forbs

Species	Annual/ Perennial	Solid Stand Seeding Rate Drilled (#/ac)	Height (feet)	Bloom Months	Drainage Adaptation
Aster, New England	Perennial	2	2 – 6	8 – 10	Well-Poor
Blackeyed Susan	Perennial	2	1 – 2	5 – 8	Excessive-Well
Bundleflower, Illinois	Perennial	10	3 – 4	7 – 9	Excessive-Well
Cardinal Flower	Perennial	1	2 – 4	7 – 9	Poor
Chickory, Common	Perennial	4	1 – 6	5 – 11	Excessive-Well
Coneflower, Pale Purple	Perennial	12	2 – 3	7 – 8	Excessive-Well
Coneflower, Purple	Perennial	10	1 – 2	6 – 8	Excessive-Well
Coneflower, upright	Perennial	1 – 2	2 – 4	6 – 9	Excessive-Well
Coreopsis, lanceleaf	Perennial	10	2 – 3	5 – 7	Excessive-Well
Coreopsis, Plains	Annual	2	1 – 3	6 - 8	Excessive-Well
Gayfeather	Perennial	12	2 – 4	7 – 10	Excessive-Well
Goldenrod	Perennial	2	1 – 3	7 – 10	Excessive-Well
Indian Blanket	Annual	10	1 – 2	6 – 8	Excessive-Well
Lemon Mint	Perennial	3	1 – 3	7 – 9	Excessive-Well
Milkweed, Butterfly	Perennial	10	1 – 3	6 – 8	Excessive-Well
Pea, Partridge	Annual	10	1 – 2	6 – 8	Excessive-Well
Phlox	Annual	8 – 10	1 – 2	4 – 6	Well-Poor
Prairie Clover, Purple	Perennial	8	1 – 2	6 – 8	Excessive-Well
Primrose, Missouri	Perennial	5	1	5 – 9	Excessive-Well
Primrose, Showy	Perennial	5	1	5 – 9	Excessive-Well
Sunflower, Maximillian	Perennial	8	5 – 8	8 – 11	Excessive-Well


USDA Plant Hardiness Zone Map
Arkansas
Bentonville
Benton
Carroll
Boone
Baxter
Fulton
Randolph
Clay
Marion
Sharp
Fayetteville
Washington
Madison
Newton
Searcy
Stone
Independence
Lawrence
Greene
Jonesboro
Craighead
Crawford
Franklin
Johnson
Van Buren
Cleburne
Jackson
Poinsett
Van Buren
Pope
Conway
Searcy
Cross
Crittenden
Logan
Faulkner
Yell
Perry
Saint Francis
Scott
Lonoke
LITTLE ROCK
Pulaski
Saline
Prairie
Lee
Polk
Montgomery
Garland
Benton
Hot Springs
Stuttgart
Helena
Monroe
Phillips
Howard
Pike
Grant
Jefferson
Arkansas
Pine Bluff
Arkadelphia
Clark
Dallas
Desha
Lincoln
Little River
Sevier
Nevada
Ouachita
Calhoun
Drew
Camden
Miller
Magnolia
Columbia
El Dorado
Union
Bradley
Ashley
Chicot
Lafayette
Red
Mississippi
Average Annual Extreme Minimum Temperature 1976-2005
Temp (F) Zone Temp (C)
-5 to 0 6b -20.6 to -17.8
0 to 5 7a -17.8 to -15
5 to 10 7b -15 to -12.2
10 to 15 8a -12.2 to -9.4
Agricultural Research Service
OSU Oregon State University
Mapping by the PRISM Climate Group Oregon State University
0 15 30 60
Miles
Kilometers
0 25 50 100