

Conservation Cover

Warm Season Grass Establishment for Wildlife

WV Conservation Practice Job Sheet

Code 327



DEFINITION

Establish warm season grasses, legumes, and forb species to provide wildlife habitat for wildlife that depend on grassland communities. This practice applies on cropland, pasture, hayland, and other lands where warm season grasses are needed for wildlife habitat.

PURPOSE

This job sheet should be used to establish native warm season grass (WSG) stands and mixed stands of grass and compatible legumes or forbs as part of a conservation plan for wildlife. The benefits to wildlife depend on the plant species used and the management practiced.

Although WSG have a shorter growing season, they make more efficient use of water and nutrients than do other grasses. Most are deep rooted, long-lived perennials with considerable tolerance to low pH, low fertility, and drought. However they grow best on deep, well drained soils with a few species tolerating poorly drained soils. WSG provide excellent wildlife habitat. Fields of these grasses can provide food and shelter for migrating warblers, thrushes, sparrows and larks in autumn. They may also provide habitat and nesting sites for native pollinators.

Most WSG grasses grow in clumps or “bunches”. The open areas between bunches permit small animals to

move freely as they search for insects and seeds. The clumps allow nests to be built under the tufts of leaves and permit adult birds to enter without detection by predators. WSG are essential to management of pheasants and bobwhite quail in West Virginia since these grasses form a more attractive habitat than do other grasses. The growth of various broadleaf plants and the presence of many kinds of insects make ideal growing conditions for young quail, turkey and songbirds that are just leaving the nests in search of food. In winter months, these grasses are taller which allow them to bend and fold under the weight of snows. This forms openings and provides winter cover for a variety of animals. Deer and groundhogs find food and shelter in all fields but they prefer other forage to WSG when available.

ESTABLISHMENT

The use of warm season grasses requires special attention to the details of establishment and management (seedbed preparation, planting and weed control). **Full establishment may take as long as three years.** The extra effort required to establish these grasses is offset by longevity of the stand and the wildlife benefits it provides.

1. Species Selection

Selection of the species to plant should be based on the objectives, habitat desired and species of wildlife targeted.

All seed should conform to the minimum state standards for purity, germination or other specifications.

Table 1 lists the recommended species and cultivars that are suitable for establishment in West Virginia. These species are adapted to most areas of the state and provide benefits to wildlife in the form of food or cover. Other legumes or forbs may be planted in conjunction with these species to provide additional benefits.

SPECIES	CULTIVARS	PRIMARY USE
Switchgrass (<i>Panicum virgatum</i>)	'Cave-in-Rock'	Forage
	'Shelter'	Wildlife
	'Blackwell'	Reclamation
Big Bluestem (<i>Andropogon gerardii</i>)	'Niagara'	Wildlife
	'Roundtree'	General
Indiangrass (<i>Sorghastrum nutans</i>)	'Rumsey'	General
	'NE-54'	General
Little Bluestem (<i>Schizachyrium scoparium</i>)	'Aldous'	Wildlife
	'Cimarron'	General
	'Camper'	General

Table 1. Recommended species and cultivars that are suitable for establishment in West Virginia.

2. Planting Dates

Warm season grasses grow best when the weather is hot and other species' growth are declining. They begin growing when the soil temperature is above 50° F and continue to grow until the soil temperature reaches nearly 90° F (usually May - September). If soil temperatures are colder than 50° F, or moisture is not adequate, the seeds will remain dormant until conditions are favorable.

WSG seed requires a cool, moist period prior to germination. This process is known as a stratification period. Most seed may be purchased already stratified. Check with the supplier to determine if any seed will require stratification or specific storage methods prior to planting.

Stratified WSG seed and forbs should be planted between April 1 – May 15. Legumes can also be over-seeded during the fall or spring after a warm season grass planting. (Annual legumes should only be seeded during the spring.)

Unstratified seed may be planted in the fall (November 15 – March 1). However, this method is not recommended due to the low success rates, low germination and additional length of time required to establish the stand.

Warm season grasses are measured and usually sold in lbs/acre of Pure Live Seed (PLS). WSG usually have a

lower germination rate than cool season species; therefore, it is essential when purchasing and planting WSG that the quantities of seed be based on PLS.

3. Seedbed and Site Preparation

Stands may be established either by conventional (disking and broadcasting) or no-till methods. No-till establishment is the preferred method since there is minimum soil disturbance, thus reducing weed competition and soil erosion. Conventional seeding may be used for establishment on areas that have been recently cropped or where weedy competition will be minimal and the risk of erosion is limited.

Any existing cover must be eliminated by herbicide application or tillage. That decision must be made early, as both methods will be the most successful if started in the fall. This is especially important when a site has a dense sod cover or there is a potential for weed competition. Consult the West Virginia University Extension Service to determine the best herbicide combination and apply it at the appropriate time in the fall. Consider using a cover crop if conventional tillage is used in the fall to prepare the site.

Since WSG seedlings are slow to establish, competition control is critical to success. Conventional seedbed preparation, herbicide application or both may be needed to control competition prior to planting. It is important to allow adequate time to complete this process.

a. No-Till

No-till establishment of WSG requires the use of herbicides. Herbicides shall be applied according to the directions, precautions and restrictions indicated on the label. Recommendations and information regarding the use of herbicides may be obtained by contacting the West Virginia University Extension Service.

Several steps are required to get successful competition control. The first step is to mow (or graze) the area to a very low height in late summer followed immediately by a fall herbicide application. If possible, after mowing and prior to herbicide application, remove any plant matter on the surface to provide a better seedbed and allow for more herbicide contact with the vegetation.

Usually, a second herbicide application should be planned; this should always occur where dense fescue or orchardgrass stands exist. This application should occur just prior to planting and after any surviving vegetation has regrown to a height of 4 to 6 inches. All herbicide applications should be performed when vegetation is actively growing.

*The **Southeast Quail Study Group** recommends the following for replacement of tall fescue or orchardgrass with wildlife plantings:

1. Mow or graze very low in late winter for a spring treatment or late summer for a fall treatment.
2. Allow the fescue to green-up to a height of at least six inches.
3. Spray the field with one or two quarts per acre of glyphosate (RoundUp™) or 3 WSP (water soluble packets) of Plateau™, 6-7 ounces of surfactant, and ten gallons of water per acre. Always check the product label to ensure that the mixture used is adequate for the situation in which this herbicide will be used. For spring treatments, wait two weeks after the initial spraying. If there is still green fescue, spot spray the problem areas. For fall treatments, spray during fall green-up then wait until the next spring and spot spray if needed.
4. After a good kill is achieved, establish wildlife-friendly vegetation.

Switchgrass and some forbs/wildflowers are not compatible with Plateau™ herbicide. If used, check the label to determine which forbs or wildflowers are compatible.

*NRCS does not recommend or require any specific herbicides by trade name. The active ingredient in Roundup is glyphosate. The active ingredient in Plateau is imazameth. Other brands of herbicide containing these ingredients may be substituted; however, application rates, timing, and results may vary. Always read and follow instructions on the label.

b. Conventional

If using conventional methods, the seedbed should be prepared by disking and/or plowing to a depth of 3 inches. After disking, make at least one trip over the field using a cultipacker to firm the seedbed. It is imperative that the seedbed be dry and firm to ensure proper planting depth. Saturated soils should not be cultipacked or planted to avoid getting seed too deep.

Another effective method for competition control is to establish WSG plantings immediately following an annual row crop such as corn. Residual corn herbicides will reduce competition yet not adversely affect the WSG planting.

3. Planting Methods and Rates

If planting only one specie, the seeding rates for Indiangrass, switchgrass, big and little bluestem is 7-10 lbs/acre PLS. These rates should be doubled if using a broadcast method.

Table 2 contains general wildlife mixtures and rates suitable for most areas of West Virginia. The seeding rates listed are for drilled stands. The rates should be doubled for other methods. Other mixtures or species may be acceptable depending on the objectives. Contact the local NRCS field office for information regarding the suitability of other species and mixtures.

Adapted forbs may be included in the mixes listed at the given rates. Forbs may include species such as: black-eyed susan, goldenrod, sunflower, coreopsis, coneflower, wild bergamot, butterfly weed or various

legumes. Commercially available native wildflower mixes may also be utilized at labeled rates. Other mixtures and species may be suitable for wildlife.

Regardless of the planting method used, seeding depth should never exceed ¼ inch. **Plantings deeper than ¼ inch will almost always fail.**

a. No-Till Seeding

Smooth seeded species like switchgrass may be planted using a conventional drill.

Species such as little bluestem, big bluestem and Indiangrass will require a specialized no-till drill or a modified conventional drill that contains a fluff box. Specialized drills have seed boxes with dividers, agitators and oversized drop tubes and may be adjusted for shallow planting depths.



b. Conventional Seeding

Seed may be broadcast if accomplished in a uniform manner and **should always be cultipacked** after seeding. Pre-mixing the seed with 200 lbs/acre of pelletized lime and utilizing an airflow applicator is an effective method. No more than ⅓ of the seed should be visible on the soil surface. Wind speed should be minimal when using this method.

Broadcast fluffy seed (big and little bluestem and Indiangrass) with a drop or cyclone type spreader. A carrier may be used to help distribute the seed. The following carriers may be used: lime at 200 lbs/acre; wheat at 40 lbs/acre; or oats at 32 lbs/acre. Since fluffy seed will only broadcast as far as the carrier, make sure your passes overlap to ensure even coverage.

MIXTURE	SPECIES	PLS (lbs/ac)	CONDITIONS	OPTIONAL
#1	big bluestem	1	Dry Sites/Well Drained Soils	adapted forbs or wildflower mix @ 0.5 lbs/ac
	little bluestem	3		
	Indiangrass	3		
#2	switchgrass	4	Well Drained - Somewhat Poorly Drained Sites	adapted forbs or wildflower mix @ 0.5 lbs/ac
	big bluestem	2		
	Indiangrass	2		
#3	little bluestem	1	General Conservation Mix (suitable for most sites)	adapted forbs or wildflower mix @ 0.5 lbs/ac
	big bluestem	1		
	Indiangrass	1		
	switchgrass	3		
	sideoats grama	1		

Table 2. Warm season grass mixes suitable for establishment in WV. Other mixtures from acceptable sources may be used.

If wheat or oats are used as a carrier, mow them prior to seed head formation.

OPERATION AND MAINTENANCE

Always allow enough time for establishment prior to harvest or disturbance of the stand, which may take as long as three years. Exclude livestock, maintain weed control and monitor stand density for the intended purpose for the life of the stand.

Weed Control During the Establishment Period

Weed control during the establishment period may be accomplished by mechanical (mowing or disking) or by chemical methods.

Competition control remains an important part of WSG establishment for up to three years after planting. To control competition and prevent weed seed formation, WSG stands may be top clipped; or post-emergent herbicides may be applied to control competition during the establishment period.

Never apply nitrogen during the planting year. This encourages cool season grass and weed competition. Lime may be applied at recommended levels. Fertilization of WSG often results in stands becoming too dense for wildlife to utilize. Consider the need and use of fertilizers carefully.

Planting Year

Mow the planting as needed to control weeds. As a general rule, never allow weeds to exceed 18 inches or form seed heads. Mow at a height of 4 to 6 inches or just above seedling height. If feasible, a “wickbar” or similar device may be used to selectively apply herbicides.

Selective or post-emergent herbicides may be sprayed over the planting to control specific weeds. Herbicides are most effective when weeds are young and actively

growing. Many WSG and wildflowers are not post-emergent herbicide tolerant (e.g. switchgrass).

Second and Third Year after Planting

Plantings should be inspected in the early spring. If cool season grasses or weeds comprise more than 25 percent of the stand, either treat with an appropriate post-emergent herbicide; or keep the area mowed very short until the WSG start to green up.

Throughout the growing season mow as needed above the seedling height to prevent weeds from overtaking the stand.

Apply lime, phosphorus, and potassium only if soil tests indicate that they are needed (i.e. pH is less than 5.5, or P and K test results are in the "low" range).

Where feasible, delay any management activities of the area until after the primary nesting season (March 15 – July 15).

Fourth Year after Planting

By the fourth year, the stand should be well established. Established stands do not require frequent attention, but periodic disturbance is necessary to stimulate growth of desirable vegetation and to eliminate encroachment of woody vegetation.

The type and frequency of management will depend on the purpose of the planting. For optimum wildlife habitat, all management practices should be conducted outside of the primary nesting season (March 15 - July 15). Management and maintenance activities may include, mowing or haying, weed control, grazing, light disking and in some instances prescribed burning to rejuvenate the stand.

Phosphorus and/or potassium may be applied moderately where desired or needed. Careful consideration should be given to the application of nitrogen. If nitrogen is required, apply 40 to 80 pounds

of nitrogen per acre split in two applications: one as growth of the WSG begins and the second in mid-summer.

Prescribed Burning

Historically WSG have existed with, and adapted to fire. Wildlife managers continue to use fire to manage WSG in some areas of the country. **In West Virginia it is extremely dangerous and difficult to manage warm season grasses with fire due to burning regulations, extreme slope and large amounts of woodland to which fire may escape.** However, this method is the best way to remove thatch or residue from prior growth, reduce invasion of woody species and stimulate forb growth. Untrained individuals should never attempt this method of management.

Prescribed burning requires a permit from the West Virginia Division of Forestry and may not be allowed during certain times of the year. Contact the West Virginia Division of Forestry for current information concerning permits and burning laws. Where possible, a WSG stand should be burned once every three to four years between January 1 and March 1.



Mowing and Haying

When burning is not an option, mowing or haying can be used to control woody growth and remove plant matter (residue). However, simply cutting these grasses and leaving the residue is not effective. If left on the surface, it will eventually smother the new growth. Cutting the stand for hay is the best method to remove residue.

On sites where soils are too wet in the spring to mow, harvest may be performed in the fall after the grasses are dormant. In order to allow a sufficient recovery period before winter dormancy, grasses should be

allowed to reach a minimum height of 10 inches before the first killing frost.

To maximize wildlife benefits, mow on a 2 to 3 year rotation to control woody growth. Where feasible, mow only $\frac{1}{3}$ to $\frac{1}{2}$ of the stand each year. The remaining areas will provide year-round wildlife food and cover.

Light Disking

Light disking may temporarily reduce the density of the WSG plants and provide openings in the planting for movement of quail, pheasants, and other wildlife. It may also encourage the germination of wild herbaceous plants.

Disking should occur on a 3 to 4 year rotation. Where feasible, disk only $\frac{1}{3}$ to $\frac{1}{2}$ of the stand each year. Refer to the WV Conservation Practice Standard (647) Early Successional Habitat Dev/Mgmt and/or job sheet entitled Strip Disking for Wildlife for more information.

Prescribed Flash Grazing

Livestock may be utilized to manipulate stand density and remove residue. In some instances this method may provide the most benefits with the least amount of impacts on wildlife. However, this technique should only be performed in accordance with a grazing plan with wildlife as the primary objective.

The rate of removal of WSG forage is determined by how many head of livestock are placed on the stand and how long they are allowed to graze the stand.

When grazing WSG as a management tool, rotational grazing should always be used. Grasses should only be grazed to a minimum height of 12 inches; or livestock should not graze more than $\frac{1}{2}$ of the above ground height. A minimum of 10 inches growth should occur in the fall in order for plants to build root reserves for wintering and initiating spring growth. As a general rule, WSG should not be grazed 30 days prior to the first killing frost to provide this reserve. This residual growth is excellent winter roosting cover and nesting the following spring.

If livestock density is very high, as in some rotational grazing systems, there must be sufficient time for nesting activities before livestock return to the WSG stand. This requires a minimum of 35 days, corresponding closely with the optimum rest period for WSG of 42 to 49 days.

Specifications

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Site-specific requirements are listed on the specification sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide and the Conservation Cover practice standard (327). Information on this job sheet is considered to be part of the conservation plan.

Client:	Farm #:	A no-till drill is available from this Conservation District office: ☐ YES ☐ NO Phone: (____)_____
Field(s):	Tract #:	
Designed By:	Date:	

Purpose (check all that apply)	
<input type="checkbox"/> Provide habitat for grassland songbirds and general wildlife	<input type="checkbox"/> Provide habitat for bobwhite quail
<input type="checkbox"/> Provide habitat for wild turkey	<input type="checkbox"/> Component of a wildlife management plan developed using the (645) Upland Wildlife Habitat Management standard
<input type="checkbox"/> Provide habitat for ring-necked pheasant	<input type="checkbox"/> Provide habitat for other wildlife: _____

Supplemental Information	
<input type="checkbox"/> Strip Disking - (Refer to 647 - Early Successional Habitat Dev./Mgmt. Strip Disking for Wildlife)	<input type="checkbox"/> Installed as a component of a permanent food plot (Refer to 647 - Early Successional Habitat Dev./Mgmt. Forest Openings)
<input type="checkbox"/> Enhancement practice for CSP program (Refer to specific program requirements and guidelines)	<input type="checkbox"/> Installed as a component of a field border (Refer to 386 - Field Borders for Wildlife)

Layout	Field _____	Field _____	Field _____
Species (or Mixture # from Table 2) ¹ lbs/acre PLS			
Species (or Mixture # from Table 2) lbs/acre PLS			
Species (or Mixture # from Table 2) lbs/acre PLS			
Other Species Seeding Rate (forbs, legumes, etc.) lbs/ac			
Total Area Planted (acres)			
Method of Establishment ²			
Site Preparation Method ³			
Fall Site Preparation Treatment Date			
Spring Site Preparation Treatment Date			
Herbicide (if known & applicable)			
Herbicide Application Dates			
Planting Date(s)			
Planting Date(s) (Forbs, legumes, row crop, etc)			
Supplemental Nutrients for Establishment (lbs/acre)			
Lime (tons/acre)			

¹ List the species to be planted. If desired, simply list the mixture number found in the left column of Table 2 of this job sheet. Other mixtures are suitable. Contact the local NRCS field office for acceptable mixtures. Use additional sheets or the "Additional Notes" section to list these species or mixtures.

² Identify how the field is to be established: **No-Till Drilled** or **Conventional** (disked and broadcast).

³ List the site preparation method to be used: **Grazing, Herbicide, Mechanical, Annual Row Crop** or any appropriate combination. Refer to the "Site Preparation" section of this job sheet for instructions.

Site Preparation (select method)

A. Site Preparation for No-Till Method

- Dense sod requires removal prior to establishment. Follow the guidance listed in this job sheet provided by the Southeast Quail Study Group for removal. **Additional requirements:**

- Graze or mow as low as possible to remove as much of the existing vegetation as possible. Apply an approved herbicide to kill existing vegetation at the rate recommended by the West Virginia University Extension Service in the fall on or by _____ (date). Apply a second application on remaining vegetation after spring green-up once vegetation has reached 4-6 inches on or by _____ (date). Follow all label precautions and directions. Wait a minimum of two weeks or as directed by the product label and plant. **Additional requirements:**

B. Site Preparation for Conventional Method

- The seedbed should be prepared by disking and/or plowing to a depth of 3 inches. After disking, make **at least one** trip over the field using a cultipacker to firm the seedbed. Ensure that the seedbed is dry and firm to obtain the proper planting depth. Wet soils should not be cultipacked or planted. **Additional requirements:**

- The site will be prepared by establishing an annual crop of _____ (refer to other conservation practices for specific guidance). Residual herbicides will reduce competition yet not adversely affect the planting. Once the crop has been removed, make **at least one** trip over the field using a cultipacker to firm the seedbed. Ensure that the seedbed is dry and firm to obtain the proper planting depth. Wet soils should not be cultipacked or planted. **Additional requirements:**

Planting Method (select method)

- No-Till Drill** Establish vegetation according to the specified seeding rate of _____ lbs/acre PLS. Seed should be drilled ¼ inch deep uniformly over the area. Smooth seeded species like switchgrass may be planted using a conventional drill. Other species may require a modified or specialized drill. Check depth of seed frequently during planting. **Additional requirements:**

- Seed should be **broadcast** at a rate of _____ lbs/ac PLS. Fluffy seed (Indiangrass, big and little bluestem) should be broadcast with a drop spreader. If using a cyclone type spreader, a carrier should be used to help distribute the seed. The following carriers may be used: pelletized lime at a 200 lbs/acre rate; wheat at a 40 lbs/acre rate; or oats at 32 lbs/acre rate. Since fluffy seed will only broadcast as far as the carrier, make sure your passes overlap to ensure even coverage. If wheat or oats are used as a carrier, mow them prior to seed head formation. **Additional requirements:**

Operation and Maintenance (select all that apply)

Follow the procedures and methods for Operation and Maintenance as outlined in this job sheet. Livestock will be excluded from the stand until well established (up to three years). Periodic disturbance of the stand may be required after establishment. Refer to other job sheets or conservation practices as indicated for more information. During the establishment period a post emergent herbicide or mowing above the seedlings may be necessary to control weeds. Contact WVU Extension Service for information regarding herbicide use. Fertilization may be required after the stand is established. No nitrogen should be applied during the establishment year. The recommended method(s) of disturbance are:

- Mowing/Hay
- Light Disking
- Prescribed Flash Grazing
- Prescribed Burning (requires permit – Contact WV Division of Forestry)

Additional requirements:

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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.

Additional Notes, Specifications, Requirements, etc.

For more information concerning this practice contact:

_____ at _____

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