

PASTURE AND HAY PLANTING

Renovation of Grass Pastures/Hayfields with Legumes

Virginia Conservation Practice Job Sheet

512(e)



Definition of Practice

Establishing legumes into perennial grasses as part of a resource management conservation plan. The grass/legumes may be used for forage, hay, pasture, or wildlife habitat

Purpose

Establish legumes into existing grass stands to improve forage quality and intake for grazing animals, improve wildlife habitat, and reduce inorganic nitrogen applications. This practice may also be used to improve or maintain livestock nutrition and/or health, extend the grazing season, improve water quality, improve soil quality, and increase carbon sequestration.

Condition where Practice Applies

Any existing forage stand, pasture or hay that could be improved with introduction of legumes.

Establishment Specifications

Depending on the species and location within the state, legumes may be established in existing grass fields either in spring or fall in the Piedmont and Mountain and Valley regions of Virginia. Spring seeding of legumes in the Coastal Plain is usually not recommended due to quick onset of hot weather before good establishment. Kill any broadleaf weeds before adding legumes. Apply lime and fertilizer according to a recent soil test. Regardless of the seeding method used, care should be taken to avoid planting the seed too deep.

Select the legume based on existing grass and soil type:

- A. Tall fescue – red and/or white clover, annual lespedeza.
 - B. Orchardgrass – red and/or white clover, alfalfa.
- (Note: Only use alfalfa on fertile well-drained soils.)

Legumes used to renovate grass fields may be established either by *minimum tillage*, or *no-till methods*. *Total inversion tillage* is not an option as you do not want to kill the existing grass. The *no-till methods* result in minimal soil disturbance which reduces weed competition and the risk of soil erosion. If soil erosion is a concern during the establishment period, then it is highly recommended to use a *no-till method* of planting. This will protect the soil in the field and reduce the potential off-site effects of soil erosion. *No-till methods* of planting legumes include frost seeding and no-till drilling. Frost seeding is effective for clovers and annual lespedeza. No-till drills may be used in the spring or fall to establish legumes in pastures. Annual lespedezas must be spring seeded. *Minimum tillage methods* include light to moderate disking to disturb 40-70% of existing sod (80-90% for alfalfa) in fall or winter. Broadcast/drill clover or alfalfa seed and

then cultipack for good seed-to-soil contact. Avoid planting in wet soil since it may result in placing the seed too deep. Use only adapted, certified, and inoculated seed.

Seed inoculation

Legumes have the ability to gather available nitrogen from the air and use it for their growth. Whenever a legume is seeded, especially in soil where that legume has not been grown in the previous 2 or 3 years, commercial strains of bacteria should be included with the seed to “inoculate” the soil and the plant roots. This insures that bacteria of a productive strain are present in sufficient quantities to fix nitrogen for the plant. Refer to the Plant Establishment Guide for Virginia for the proper strain of inoculant.

Weed control before planting

Weed control is critical to ensuring a good renovation of the pasture or hayland. Control should begin prior to the seeding and seedbed operations. Either management or herbicide applications or both may be used to control weeds prior to establishment. When using pesticides, consult your local Virginia Cooperative Extension agent or the Virginia Cooperative Extension Pest Management Guides located on the web site at <http://www.ext.vt.edu/pubs/pmg/> for specific pesticide recommendations. Always follow the label instructions when using pesticides.

When frost seeding or drilling legumes into pastures, overgraze or closely mow the sod in late fall/early winter. Broadcast seed in late winter on a freeze or drill seed at appropriate depth in early spring or late summer/early fall.

When seeding by *no-till methods*, use herbicides to reduce (not kill) grass stand. Care needs to be exercised with no-till drills to ensure correct seed flow and seeding depth. Seed must be placed in firm contact with the mineral soil at a depth of $\frac{1}{8}$ - $\frac{1}{4}$ ". Depth control bands or other controls should be used to ensure proper placement of seed. ***Packer wheels are essential.***

Calibrate the drill and when planting, check the seeding depth often to avoid planting too deep. Do not pull the drill too fast. No-till seed in the spring or late summer/early fall. Note: Annual lespedeza is only spring seeded.

Use of adapted and compatible species, varieties, or cultivars is important to the success of the planting. Seed will conform to minimum state standards for purity, germination, and other features. Seed tags and other information may be requested by an NRCS representative to verify seed quality. Never compromise seed quality.

See attached establishment recommendations for your farm.

Specifications

Site-specific requirements are listed on this specification sheet. This job sheet is provided as a component of a resource conservation plan. Plan maps, location of fields to be planted, complementary conservation practices and measures, grazing schedule, other relevant information, and additional specifications may be included. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See Conservation Practice Standard, *Pasture and Hay Planting* (512).

Client:	Farm #:	A no-till drill is available from the SWCD office: <input type="checkbox"/> YES <input type="checkbox"/> NO Phone: (____) _____
Field(s):	Tract #:	
Prepared By:	Date:	

Purpose (check all that apply)	
<input type="checkbox"/> Provide a source of nitrogen.	<input type="checkbox"/> Balance forage supply and demand during periods of low forage production.
<input type="checkbox"/> Improve or maintain livestock nutrition and/or health.	<input type="checkbox"/> Improve the quality of the forage.
<input type="checkbox"/> Extend the length of the grazing season.	<input type="checkbox"/> Improve soil quality and increase carbon sequestration.
<input type="checkbox"/> Improve water quality.	<input type="checkbox"/>

Specifications	Field _____	Field _____	Field _____
Existing Pasture Grass			
Legume Species to be seeded			
Inoculant used (if recommended)			
Lime (tons/acre)			
Fertilizer (tons/acre)			
Planting Method ¹			
Site Preparation Method ²			
Site Preparation Treatment Date			
Herbicide (if known & applicable)			
Herbicide Application Dates			
Planting Date(s)			
Total Area Planted (acres)			

¹ Identify how the field is to be established: **No-Till Drilled** or **Conventional** (disked and drilled or broadcast), **Frost Seeded**.

² List the site preparation method to be used: **Grazing, Herbicide, Mechanical**, 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

- Graze heavy or mow as low as possible to remove as much of the existing vegetation as possible. **Additional requirements:**
- The site will be prepared by grazing followed by an application of broadleaf herbicide as recommended by the Virginia Cooperative Extension Service 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. *All Herbicide applications should be performed when vegetation is actively growing.* **Additional requirements:**
-

B. Site Preparation for Minimal Tillage Method

- The site will be prepared by grazing followed by a light disking to expose soil. 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:**

Planting Method (select method)

- No-Till Drill** - Establish vegetation according to the specified seeding rate of _____ lbs/acre. Seed must be placed in firm contact with the mineral soil at a depth of ¼ to ½ inches. *Packer wheels are essential.* Check depth of seed frequently during planting. Depth control bands or other controls should be used to ensure proper placement of seed. **Additional requirements:**
- Minimum tillage** - Drill or broadcast seed in a uniform manner. A roller or cultipacker should be used to ensure good seed-to-soil contact. No more than ⅓ of the seed should be visible on the soil surface. Seeding depth should never exceed recommendations in Table 1. If planting with a drill, check depth of seed frequently during planting. **Additional requirements:**
- Frost Seeding** - Broadcast seed during the winter when freezing and thawing of the ground is producing frost action with ice crystals coming out of the ground. This is usually between late January and late February when the snow is off the ground. If there is not sufficient frost action after applying the seed, allow your cattle to walk the pastures to tread the seed into the soil surface. Only do this when the soil is firm so that the cattle will not punch the soil and push the seed too deep into the soil. **Additional requirements:**

Operation and Maintenance

After planting, competition control remains an important part of establishing legumes in existing grass. To control competition and prevent weed seed formation, the established stands may benefit from top clipping as needed from May through July or rotate animals through the field(s) (graze to 3-4" in 3 to 5 days).

Allow enough time for establishment prior to harvest or grazing of the stand.

If possible, livestock shall be excluded until the plants are well established. If not, move animals out when they begin to eat the legume seedlings especially during the establishment period.

Flash graze grass when it begins to overshadow legume seedlings to reduce competition.

Apply needed fertilizer (not nitrogen) and lime per soil test recommendations.

Post emergent herbicides may also be used during the establishment period as recommended by your local extension agent.

Maintain soil fertility.

Growth of seedlings shall be monitored for water stress. Water stress may require reducing weeds, irrigating when possible, or replanting failed stands, depending on the severity of drought.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management by manipulating livestock type, stocking rates, density, and duration of grazing period.

Insects and diseases shall be controlled when an infestation threatens stand survival.

Evaluate forage stands each season or as needed to determine management inputs needed to achieve the desired purpose(s).

Inspect and calibrate all equipment.

Additional requirements:

If needed, an aerial view may be provided. Other relevant information, complementary practices and measures, and additional specifications may be included. See Conservation Plan for field and practice locations.

Additional Notes, Specifications, Requirements, etc.

For more information concerning this practice contact:

_____ at _____

Legume Seeding for Renovation

			Recommended Seeding Dates ¹				
Legume	Seeding Rate (pure Live Seed)		Coastal Plain	Southern Piedmont	Mountain/Valley Northern Piedmont	Desired pH	Seeding Depth
White clover	*Frost 2	Drill 1	9/1-10/15	2/15-4/1 8/15-10/1	3/1-4/15 8/1-9/15	5.8-6.2	1/8"-1/4"
Red clover	10	6	9/1-10/15	2/15-4/1 8/15-10/1	3/1-4/15 8/1-9/15	5.8-6.2	1/8"-1/4" 1/8"-1/4"
White clover and Red clover	2 6	1 4	9/1-10/15	2/15-4/1 8/15-10/1	3/1-4/15 8/1-9/15	5.8-6.2 5.8-6.2	1/8"-1/4" 1/8"-1/4"
Annual lespedeza	15	10	2/1-3/15	2/15-4/15	3/1-4/15	5.5-6.2	1/4"-1/2"
Alfalfa	n/a	6	Fall 30-60 days < 1 st killing frost	Spring – 30 days before last killing frost Fall – 30-60 days before first killing frost			

¹ clovers and annual lespedeza may be frost seeded on a freeze in late winter.

* frost = frost seeding where the seed is broadcast on top of the soil in late winter during a freeze.