



Cool Season Grass Establishment



What is a grassland? Simply stated, a grassland is land on which grasses and/or legumes are the dominant vegetation. There are two types of grasslands, warm season grasslands, which actively grow from June-August and cool season grasslands, which are actively growing in the spring and fall. Grasslands, warm season and cool season, are highly valued as nesting cover for many species. In addition, grasslands also provide food in the form of seeds, vegetation and insects. This fact sheet will provide you some insight on how to establish and manage your cool season grassland.

Cool season grasses can be an important component to your wildlife habitat. Unfortunately, in Indiana, all too often a cool season grass planting is a pure stand of tall fescue. Fescue provides very poor habitat and is quite often detrimental to wildlife. There are several other cool season grass species that are better suited for wildlife, especially when planted in mixes and in conjunction with warm season grass plantings (*see HMFS Warm Season Grass Establishment*). “Wildlife friendly” cool season grasses include, Orchardgrass, Kentucky Bluegrass, Timothy and Redtop. Recently, two native species, Canada Wildrye (on upland sites) and Virginia Wildrye (on bottomland sites) have been utilized in cool season grass plantings. Table 1 below lists some characteristics of the preferred cool season grass species.

Table 1. Characteristics of Preferred Cool Season Grasses						
Species	Growth Habit	Flood Tolerance	Drought Tolerance	Soil pH	Soil Type	Sunlight
Timothy	2-4' tall sod forming	Fair	Poor	5.0 – 7.5	Sandy - Clay	Full sun
Redtop	2-3' tall sod forming	Good	Good	4.5 – 8.0	Clay-Loamy-Sandy	Full Sun to Partial Shade
Orchardgrass*	2-4' tall intermediate*	Fair	Fair	5.5 – 8.2	Loamy-Clay	Full Sun to partial shade
Kentucky Bluegrass	1-2' tall sod forming	Fair	Good	6.0-7.5	Sandy Loam to Clay	Full Sun
Virginia Wildrye **	3-6' tall bunchgrass	Good	Fair	5.5-7.5	Sandy-Clay	Partial Sun to Partial Shade
Canada Wildrye**	3-4' tall bunchgrass	Fair	Fair	5.5-7.0	Sandy-Sandy Loam	Full Sun to Partial Shade

* Orchardgrass shows characteristics of both a sod forming grass and a bunchgrass, but over time it will tend to be more sod-like.

** Native species

Cool season grasses actively grow in spring and fall, when the soil temperature is between 32 and 65 degrees Fahrenheit. This “early and late” growth means cool season grasses can provide food and cover when warm season species have not yet started or have already ended their growth. Most cool season grasses are short (2-4 feet tall). They are well suited to a variety of site conditions and are somewhat shade tolerant. The more “wildlife friendly” species tend to grow in clumps or bunches. Since these species grow in clumps, there is usually enough bare ground between clumps to allow small mammals and chicks to move freely in search of food while the grass clumps provide escape cover. When planted as a mixture with legumes, cool season grasses become an integral part of your wildlife habitat. Table 2 below lists some characteristics of some selected legumes.

Table 2. Characteristics of Selected Legumes						
Species	Growth Habit	Flood Tolerance	Drought Tolerance	Soil pH	Soil Type	Sunlight
White Dutch Clover *	<10” tall Winter hardy	Fair	Poor	6.0-6.5	Loam, Clay, Muck	Full Sun
Ladino Clover *	<10” tall Winter hardy	Fair	Fair	6.0-6.5	Sandy Loam- Clay Loam	Full Sun
Alsike Clover	2-4' tall winter hardy	Good	Poor	5.0-6.5	Loam - Muck	Full Sun
Medium Red Clover	2-4' tall winter hardy	Poor	Fair	> 6.0	Sandy-Loam	Full Sun
Birdsfoot Trefoil *	1-2' tall	Good	Fair	5.0-8.0	Loamy - Clay	Full Sun
Alfalfa	1-3' tall winter hardy	Poor	Good	>6.5	Sandy-Loamy	Full Sun to Partial Shade
Annual Lespedezas	1-3' tall	Fair	Fair	6.5-8.0	Sand, Loam, Clay	Full Sun

* Less frequent reseeding required due to their greater persistence

Site Preparation

If you are converting an existing fescue field it is imperative that the fescue first be removed (see *HMFS Fescue Eradication*). If you will be converting from row crops, you will need to mow the stubble as low as possible prior to planting. There is one note of caution if you are converting from row crops. Be aware of potential residual effects of chemicals used on the crop field in previous years. Your cool season grass planting may be killed or suppressed by some chemicals. Consult product label or local herbicide dealer for more information.

Before planting, be sure to have a soil test conducted to determine what the fertilizer and lime requirements are. If lime is required, it is best to apply the lime several months prior to planting. If more than 3 tons of lime is required, it is best to split the application in half and apply half in the fall and half in the spring. This will allow time for the lime to incorporate itself into the soil. Fertilizer applications can be made at planting.

Seed Mixtures

To best benefit wildlife, cool season grasses should always be planted in a mixture that consists of 1 or 2 species of grass and 1 or 2 species of legumes. Pure stands of 1 species are much less beneficial to wildlife. It should also be noted that over time, the grasses will replace the legumes in your stand. Table 3 below lists some seeding rates and mixtures for various site conditions (wet, dry, and intermediate):

Table 3. Suggested Seeding Mixtures (lbs./acre) for Selected Conditions			
Wet Site Conditions			
Mixture 1		Mixture 2	
Redtop	1	Redtop	1
Orchardgrass	3	Virginia Wildrye	1
Alsike Clover	1	White Dutch Clover	1
Birdsfoot Trefoil	2	Birdsfoot Trefoil	2
Dry Site Conditions			
Mixture 1		Mixture 2	
Timothy	1	Timothy	1
Kentucky Bluegrass	1	Canada Wildrye	2
Red Clover	1	Ladino Clover	1/2
Alfalfa	3	Annual Lespedeza	2
Intermediate Site Conditions			
Mixture 1		Mixture 2	
Redtop	1	Timothy	1
Orchardgrass	2	Redtop	1
Ladino Clover	1	Red or Ladino Clover	1
Alfalfa	2	Annual Lespedeza	2

Establishment

There are three basic methods used to plant cool season grasses: broadcast onto a prepared seedbed, drill into a prepared seedbed and no-till drill into a herbicide treated stand of grass. The method you choose to employ will depend largely on site conditions, and equipment availability. Cool season grasses can be planted in spring (February–May), but the preferred planting time is in the fall (August–September). Spring plantings of cool season grass have a higher chance of failure because the root system may not develop enough to withstand the hot and dry conditions of summer.

No-Till Drill

This method is usually the quickest and simplest method. It is well suited to erosive sites. No-till sites tend to have fewer competing weeds than the sites planted by other methods. In addition, no-till sites can be planted when it is too wet for conventional planting. Probably the biggest advantage of using no-till grass drills, is that these drills give you the capability to efficiently and simultaneously plant seeds of varying size. These drills are available for rent at many SWCD districts throughout the state. Contact your local district biologist or NRCS office for availability and rental rates. Possible disadvantages of no-till include good seed to soil contact can be hindered by the residual vegetation and drill availability may be limited during peak planting times. No-till drilling is usually the recommended planting method for cool season grasses.

Step 1. Remove excess vegetation by burning, mowing, haying or grazing. If planting into an existing fescue stand, see *HMFS Fescue Eradication*

Step 2. 1-2 weeks prior to planting when vegetation has re-grown 8-10", apply a glyphosate herbicide at the rate of 1-2 qts/acre. (*This step may not be required if converting from row crops*)

Step 3. Plant seed $\frac{1}{4}$ " – $\frac{1}{2}$ " deep at the recommended rate.

Drill Into a Prepared Seedbed (conventional tillage)

This method generally results in better seed to soil contact and better seed germination. No "special" equipment is required. However, soil erosion can be a problem with conventional methods. Also, this method requires much greater field preparation (disc, harrow etc.). As a result of the greater soil disturbance, there is the potential for greater weed competition, which, in turn could lead to added herbicide applications. If soil erosion is a possibility, a cover crop of wheat (30 lbs/acre) in the fall or oats (30lbs/acre) in the spring should be planted.

Step 1. Prepare a seedbed that is firm level and free of weeds. This is best done with a disc. The initial discing should be done in the fall prior to spring planting. This will help expose roots for a better winter-kill.

Step 2. Just before spring planting, additional passes with a disc or harrow will be required to adequately prepare the seedbed. Do not disc too deeply. The deeper you disc, the greater the likelihood of bringing weed seeds up into the germination zone.

Step 3. Plant seed $\frac{1}{4}$ " – $\frac{1}{2}$ " deep at the recommended rate.

Broadcast Into a Prepared Seedbed

Broadcast seeding can be done in two different ways (each described below). Broadcast seeding requires extensive field preparation and the field is more susceptible to erosion and weed competition. A cover crop of wheat in the fall and oats in the spring should be considered if erosion is a possibility. In addition, you will need to add 25% more seed to the recommended mixture. This planting method of cool season grass establishment is generally the least preferred of the three methods.

Frost Seeding (ideal for sites that are too wet for spring planting)

Step 1. In September or October, prepare a firm, level seedbed that is free of weeds. This is best done with a disc and may take several passes.

Step 2. In January or February, broadcast the seed onto the seedbed. To ensure adequate coverage, two passes over the field will be required. The passes should be at right angles to each other ("criss-cross" the field). The subsequent freezing and thawing of the ground will ensure good seed to soil contact.

Spring or Fall Broadcasting

Step 1. Prepare a firm level seedbed just prior to planting. This may take several passes with a disc or harrow.

Step 2. Roll/cultipack the field after discing and just before planting.

Step 3. Broadcast the seed in two passes at right angles to each other.

Step 4. Run a cultipacker or roller over the field to ensure good seed to soil contact. If you lack a roller or packer, a section of chain link fence weighted with concrete blocks can be used. Discing the seed in is not recommended since it would be very easy to cover the seed too deep.



Cool season grass stands often take a year or two to become solidly established. Mowing to control unwanted weeds, will be very important during the first year. In heavily infested fields, mowing two or three times the first year may be necessary. The frequent mowing the first year will result in a loss of nesting cover for that year, but will help ensure high quality nesting cover in subsequent years. THESE FREQUENT MOWINGS SHOULD ONLY BE DONE AS NEEDED DURING THE FIRST YEAR WHEN THE STAND IS BECOMING ESTABLISHED.

Maintenance

The goal of maintaining your grassland is to control weeds and woody vegetation while keeping nest and brood destruction to a minimum. This can be a very fine line. There are several maintenance techniques that you can utilize to keep a healthy and diverse grassland. These maintenance techniques include: Inter-seeding, Strip Discing, Strip Spraying and Prescribed Burning. For more information on each technique, refer to the appropriate Habitat Management Fact Sheet.

Related *Habitat Management Fact Sheets*:

Warm Season Grass Establishment
Warm Season Grass Management
Strip Disking

Strip Spraying
Prescribed Burning
Legume Interseeding

Prepared by the Indiana Department of Natural Resources, Division of Fish and Wildlife. For up-to-date information concerning the Indiana Division of Fish and Wildlife, or for information on the location of your District Wildlife Biologist, visit our website at www.wildlife.IN.gov

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