

How to Establish and Maintain Introduced Grasses and Legumes Wisconsin Job Sheet 134

Landowner: _____ Tract: _____

Purpose

This job sheet describes methods to establish and maintain introduced grasses and legumes and applies to the following practice:

- Conservation Cover (327)
- Critical Area Planting (342)
- Forage and Biomass Planting (512)

Introduced grasses and legumes can be used to accomplish one or more of the following:

- Stabilize areas with existing or expected high rates of soil erosion.
- Enhance pollinator and wildlife habitat.
- Improve forage production and livestock health.
- Improve soil, water, and air quality.

For additional recommendations, refer to Wisconsin NRCS Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes, located at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wi/technical/?cid=nrcs142p2_020841



Species Selection and Seed Quality

Species and cultivars must be selected based upon the adaptation to site conditions, including appropriate moisture regime or forage suitability group, climatic conditions, soil conditions, and landscape position.

1. Select species based on growth characteristics, fertility requirements, disease resistance, compatibility with other species, and the intended use of the seeding.
2. Mixtures must meet all requirements of the Wisconsin weed laws. Species identified as restricted or prohibited by law shall not be planted.
3. Seed must be of high quality and meet the requirements of the Wisconsin seed laws for certification. If you plan to use untested seed, prior approval must be granted from NRCS before planting. If certified seed is not available, non-certified seed may be used as long as the seed is tested for purity and germination by a testing laboratory following Association of Official Seed Analysts (AOSA) procedures.
4. If more than 20 percent of the legume seed is hard seed, increase the seeding rate for legumes by the percent of hard seed.
5. Legume seeds must be inoculated prior to planting.

Seeding Periods and Rates

Seeding rates and species are provided on the attached seeding plan. Rates are based upon Pure Live Seed (PLS). In order to determine PLS, the seed must be tested for purity and germination. If you are receiving financial assistance for this practice, any changes to the species or rates listed in the seeding plan must be approved before seed is purchased.

- Permanent, perennial vegetative cover will be established within the recommended seeding dates as shown on the attached seeding plan. When it is

not possible to seed during the recommended seeding dates, a temporary cover will be required to reduce erosion until the seeding can be completed.

- **Frost Seeding.** The frost seeding period in Wisconsin typically ranges from February to mid-March but may vary from year to year depending on the weather. Frost seeding is allowed only during the active freezing and thawing cycle and can be completed on fields where good seed-to-soil contact can be obtained. Do not frost seed on fields with solid ice or snow cover greater than 2 inches. Seeding rates must be increased by 15 percent. Refer to your seeding plan to determine if frost seeding is allowed for your situation.
- **Dormant Seeding.** Dormant seeding occurs late in the fall when the soil temperature is cool enough to prevent germination until the following spring. This type of seeding provides greater risk of failure due to variability in weather and often has reduced yields. Seeding rates must be increased by 15 percent when seeding during this time period. Refer to your seeding plan to determine if dormant seeding is allowed for your situation.

Fertilizer and Lime Requirements

Forage and Biomass Planting (512)

If you are planting hayland or pasture, soil tests no older than 4 years must be taken according to UW Extension Publication A2100, Sampling Soils for Testing. You will need at least one sample for every 5 acres or less, and the samples must be analyzed at a Wisconsin certified soil testing laboratory. Any recommendations for fertilizer or lime will be applied based on UW Extension Publication A2809, Nutrient Application Guidelines for Field, Vegetable and Fruit Crops.

Conservation Cover (327) or Critical Area Planting (342)

When following either of these standards, you can choose to take a soil test using the procedure listed above or follow a general recommendation. If you choose not to obtain a soil test, a general recommendation of 150 pounds per acre of a 20-10-10 fertilizer and a minimum of 2 tons per acre of 80-89 lime may be used. Under certain conditions, fertilizer and/or lime requirements may be waived.

Seeding Methods

Conventional Seeding

Conventional seeding includes preparing a firm seedbed by using tillage and packing equipment. The seed is broadcasted on the soil surface and incorporated by secondary tillage or packing equipment.

When using a drill, seed should be sorted according to size and shape and placed in the appropriate seed boxes to ensure uniform distribution across the field. Seed can also be broadcast by using air seeders, fertilizer spreaders, or other types of rotary or drop seeder implements. When a small amount of seed is being applied over a large area, a carrier should be mixed with the seed. Carriers such as pelletized lime, fertilizer, cracked corn, saw dust, vermiculite, etc., may be used.

The seedbed should contain enough fine soil particles to provide uniform shallow coverage of the seed as well as contact with moisture and nutrients. It is important to have a firm seedbed. As a minimum, cultipack or roll before and after seeding. When walking on a properly prepared seedbed, the depth of your footprints should not exceed $\frac{1}{4}$ inch. Do not use heavy, no-till type drills to seed on conventionally prepared seedbeds. Heavy drills tend to sink into the soil and seeding depth will be difficult to control. Do not plant seed deeper than $\frac{1}{4}$ inch.

No-Till Seeding

No-till planting is the planting of grasses and/or legumes in the absence of tillage. No-till can be used to establish new seedings on land previously in row crops or existing sod. As with conventional seeding, seed placement should be no deeper than $\frac{1}{4}$ inch. A drill equipped for no-till planting must be used to obtain proper seeding depth unless the ground is soft enough to allow consistent penetration of disk openers of a conventional drill. Herbicides are often necessary when using no-till methods of establishment. When using herbicides, be sure to read and follow all label directions.

No-Till Planting Into Crop Residue

Residue should be uniformly distributed over the field

from the previous year's harvest. It is often preferred to plant new seedlings into soybean stubble when using a no-till drill. No-tilling into large amounts of non-fragile residue such as corn stalks and small grain residue may reduce germination and seedling vigor. For spring weed control, use a nonselective herbicide to kill weeds prior to planting. Be careful not to select a herbicide that will have carryover or residual effects on your new seeding.

No-Till Planting Into Existing Sod

No-till planting can be used to completely renovate existing sod. In order to prepare a good seedbed for no-tilling into existing sod, plant litter and existing growth must be removed or altered prior to applying nonselective herbicides. Options to remove or reduce existing cover include mowing, burning, haying, or grazing.

- **Mowing:** Mow the site using a rotary mower or flail chopper to a height of 3 inches. Mowing equipment should uniformly distribute the mowed plant material over the field surface.
- **Burning:** Conduct a prescribed burn according to the requirements outlined in the burn plan. The burn plan must address safety concerns and document the appropriate timing for the burn.
- **Haying:** Mechanically harvest vegetation from the site the year before the planned seeding. The timing of the hay harvest should be planned to minimize the amount of re-growth that will occur prior to herbicide application.
- **Grazing:** Timing and duration of grazing must be intensive enough to significantly reduce the existing vegetative cover. If possible, begin the grazing at a time of the year when the standing vegetation is green and growing to increase the palatability and feed value of the forage which will result in a more uniform removal of the vegetation.

After the existing plant litter is altered or removed, allow plants to actively re-grow before applying a nonselective herbicide. Be aware of herbicides that may have carryover or residual effects. Timing of herbicide applications usually occurs in the spring before plants flower or early fall to actively-growing plants. Herbicide applications in the fall often have greater efficacy, but air temperature should be above 50° F to improve plant uptake.

Inter-Seeding

Inter-seeding includes any stand modification that maintains some vegetative component of the original stand. Inter-seeding is a good way to improve existing stands that lack plant diversity or have low-yielding forage species. Existing plant growth and litter will need to be reduced, and the same options used for no-tilling into existing sod can be used. In addition, limited tillage can be used to suppress the existing cover.

- **Limited Tillage:** Limited tillage may also be used to suppress the existing stand. Fields can be tilled to a depth of 3 to 5 inches and should expose at least 50 percent of the soil surface. Careful consideration should be used when using limited tillage due to potential erosion concerns or the potential to encourage additional weed growth due to soil disturbance.

After reducing plant growth, herbicides can be used to suppress, not eliminate, vegetation prior to interseeding. One must consider the current types of plants in the field (grasses vs. broadleaves) and which species you want to suppress. In addition, current field conditions and timing of application must be considered before selecting a herbicide.

A drill equipped for no-till planting must be used to obtain proper seeding depth unless limited tillage is used to prepare the seedbed. In this case, seed may be broadcast or drilled. Use a cultipacker or roll the seedbed before and after seeding when tillage is used

Temporary Cover and Companion Crops

Temporary Cover

Temporary cover is required when seed or planting stock is not available, the normal planting period has passed, or where herbicide carryover is likely. A temporary cover will typically not be necessary on those areas where at least 50 percent of the ground is covered with either crop residue or vegetative cover. Temporary cover crops must be clipped or terminated prior to seedhead emergence or before planting permanent cover.

Temporary Cover			
Species	Triazine Herbicide Carryover Likely		Seeding Dates
	Forage Sorghum	½ bu.	
Sorghum-Sudangrass Hybrid	1 bu.		5/15 to 7/15
Sudangrass	1 bu.		
Winter Wheat	120 (2 bu.)	Not recommended	8/1 to 10/15
Winter Cereal Rye	112 (2 bu.)	Not recommended	
Oats	64 (2 bu.)	Not recommended	4/1 to 9/1
Annual Ryegrass	20 lbs.	Not recommended	4/1 to 9/1

Companion Crops

Companion crops can be used to reduce the amount of erosion on critical sites, suppress weeds, and provide added protection for permanent perennial vegetation seeded during the first year of planting. If the seeding is not used for hayland purposes, the companion crop must be mowed before seedhead emergence. Second and subsequent mowings may be necessary when re-growth provides competition to new plantings. Mowing should only remove the growth above the developing seedlings. Companion crops seeded late summer in most cases will not require clippings prior to the first killing frost unless the growing season is prolonged. Refer to your seeding plan to determine if companion crops are recommended for your situation.

Mulching

Mulch materials shall consist of natural and/or artificial materials such as plant residue, wood bark or chips, plastic, or fabric. Mulching is generally performed after grading, soil surface preparation, and seeding and plantings are complete. Mulch material shall be evenly applied and anchored to the soil. Review your engineering or seeding plan or consult

your conservation planner to determine if mulching is required.

Operation and Maintenance

Weed control during establishment is critical to ensure survival of the new stand. Mowing, herbicide application, or grazing may be used alone or in combination to control weeds before they go to seed. Graze or mow the existing stand at a height of 4 to 6 inches before weeds go to seed. If grazing the stand, be cautious of selective grazing where animals do not uniformly graze the stand. Be careful not to mow or graze when the soil is wet to avoid damage to seedlings. If residue will be left on the field, do not allow the vegetation to grow too high prior to mowing; otherwise, excessive residue may accumulate and smother seedlings. Additional treatment may be needed every 3 to 4 weeks throughout the growing season until the stand becomes established. If using herbicides, be sure to follow all label directions.

Once the permanent vegetation is established, control noxious weeds or invading woody vegetation by spot mowing, spraying with herbicides, grazing, burning, or other methods appropriate for the site. To maximize wildlife benefits, mow before May 15 or after August 1 to protect nesting birds and provide cover.

Please note: If you are receiving financial assistance for this seeding, certain methods and timing of maintenance may not be allowed. Refer to your contract agreement for specific guidance.

Conservation Reserve Program Requirements

CRP rules allow the cover to be managed throughout the year to control weeds or woody vegetation UNTIL the cover is determined to be established (typically within the first 3 years of the contract).

Once the cover is established, no disturbance is allowed during the primary nesting season recorded in the CRP contract (May 15 through August 1). Spot clipping or spot spraying may be done during the primary nesting season with prior approval from the local Farm Service Agency (FSA) County Committee.

Any haying or grazing of CRP must be approved by the Farm Service Agency in advance.

Example Pure Live Seed (PLS) Rate

Calculations:

- Step 1 – Determine the seeding rate of each of specie. For example: 80 PLS pounds per acre of Spring Barley is planned.
- Step 2 – Multiply the percent purity by the percent germination of each specie based on seed tag information. For example: 98% purity x 60% germination equates to 0.588% PLS.
- Step 3 – Divide the planned seeding rate by the percent PLS to find the bulk seed needed per acre. For example: 80 lbs. of Spring Barley per acre / 0.588% PLS = 136 lbs/acre.

The adjusted pure live seeding rate of 136 pounds of Spring Barley per acre is required to meet the seeding criteria for his example.