

INDIANA SEEDING TOOL

(NOVEMBER 2009)

ESTABLISHMENT OF HERBACEOUS VEGETATION

Species Selection

Select species and rates from the tables in each appropriate practice standard or the Indiana NRCS Seeding Tool – *Indiana Seeding Calculator* to meet practice criteria (for muck, see Muck Planting Specifications on page 5). All seeding rates will be given in pounds or ounces of Pure Live Seed (PLS) per acre.

- To calculate percent PLS rates, multiply the percent purity by the percent germination.

$$\text{PLS} = \% \text{ Purity} * \% \text{ Germination}$$

- Divide the seeding rate by the % PLS to find the bulk seed needed per acre.

$$\text{Bulk pounds} = \frac{\text{PLS needed}}{\% \text{ Purity} * \% \text{ Germination}}$$

Example: 98% Purity X 60% Germination = .588 PLS, 10 pounds seed per acre/.588 PLS = 17 pounds of bulk seed per acre.

Seeding Dates

Table 1: Seeding Date Criteria

SEEDING WINDOWS for PERENNIAL VEGETATIVE COVER IN INDIANA											
<i>Plant Species</i>	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec-Feb.	
Cool Season Grasses				1						1	Dormant ²
Forage Legumes										Dormant ²	
Native warm season plants										Dormant ²	
Native Wildryes										Dormant ²	
¹ Tall Fescue and/or Perennial Ryegrass only, with a mulch cover, Primarily for Critical Areas. ² Dormant/Frost seeding from December thru February. Increase seeding rates by 25%. Not for Critical Areas or new forage establishment.				Legend <div style="display: flex; align-items: center; gap: 10px;"> <div style="width: 15px; height: 15px; background-color: #4CAF50; border: 1px solid black;"></div> Suitable seeding dates for all of Indiana <div style="width: 15px; height: 15px; background-color: #8BC34A; border: 1px solid black;"></div> Flood plains and ponded soils </div>							

Legumes can be seeded in the fall but **Ladino, Alsike, White Dutch and Red Clover** germinate best as a spring planting. **Alfalfa** does not establish well under dormant seeding.

All cool season grasses can be planted either in the fall or spring; however **Redtop**, has the best success when planted in the spring. Dormant seeding cool season grasses for forage is only used to enhance an existing stand and not for a new establishment. Dormant seeding will not be used for Critical Area-type plantings.

Warm season grasses can be seeded in the dormant or spring seeding period except **Prairie Dropseed**, which should be dormant-seeded within 6 months of its seed harvest.

SEEDING WINDOWS FOR COVER CROPS IN INDIANA

NOTE: Northern and southern Indiana seeding dates for the tables below are divided on a general line along US 36 from Illinois to Indianapolis and US 40 from Indianapolis to Ohio

Best window of opportunity and greatest benefit for various cropping scenarios

After harvest
 Aerial or interseed

After corn
 After soybean
 After seed corn
 After corn silage
 After vegetable crop
 After wheat
 After early veg. crops

Plant Species	March	April	May	June	July	August	Sept.	Oct.	Nov.	De.-Feb.
Annual Ryegrass										
Cereal Rye										
Winter Wheat							1	1		
Spring Oats										
Winter Triticale										
Hairy Vetch										
Field/Winter Peas										
Cow Peas										
Non-dormant Alfalfa										
Berseem Clover										
Crimson Clover										
Red Clover ²										Dormant ²
Brassicas (Rape, Canola, Turnips)										
Oil Seed Radish										
Sorghum Sudangrass ³										
Millet(Japanese, Pearl)										
Buckwheat										

SEEDING WINDOWS FOR SUPPLEMENTAL LIVESTOCK FORAGE IN INDIANA

Plant Species	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec-Feb.
Annual Ryegrass										
Perennial Ryegrass										
Cereal Rye										
Winter Wheat							1	1		
Spring Oats										
Winter Triticale										
Crabgrass (Forage Type)										
Field/Winter Peas										
Cow Peas										
Red Clover ²										Dormant ²
Brassicas (Rape, Swedes)							4	4		
Brassicas (Turnips, Pasja)										
Sorghum Sudangrass ³										
Millet(Japanes, Pearl)										

¹ FFD--Not to be planted prior to Fly-Free Date

² Dormant/Frost seeding from December thru February. Increase seeding rates by 25%.

³ Also Sudangrass

⁴ Depends on variety

Legend

- Suitable seeding dates for all of Indiana
- Additional suitable seeding dates for Southern IN
- Additional suitable seeding dates for Northern IN
- When adequate moisture is present for germination

Companion/Nurse Crops

A companion/nurse crop will be used when erosion control and weed suppression are needed. Companion/nurse crops include Oats, Winter Wheat (after the Hessian Fly-free dates in Table 2), Barley, Cereal Rye or Annual Ryegrass; native Wildryes (i.e. – *Elymus sp.* such as Canada, Riverbank, and Virginia Wildrye) are also effective, especially for native seedlings and tree plantings.

Companion crops will be clipped after jointing, but before seed head pollination unless otherwise directed (control of Wildrye species is not necessary so that they persist as part of native seedlings). A second and subsequent clipping is necessary if re-growth provides competition. Clipping height should be above developing seedlings. Where excessive growth has accumulated, the vegetation will be chopped rather than swathed.

Temporary Cover

A temporary cover crop will be established according to the IN FOTG Standard (340) Cover Crop for erosion control and weed suppression when either of the following occurs:

- (a) The normal planting period for the species has passed.
- (b) Chemical residues will not allow establishment of cover.
- (c) Other limiting situations are present.

If herbicide-carryover potential exists, select species that are compatible with the previously-used herbicide. See Purdue University *Weed Control Guide* WS-16, and refer to the manufacture's label.

Temporary cover crops will be clipped prior to seed maturity unless otherwise directed in the plan.

Lime and fertilizer

General Conservation Seedings: (Conservation Cover, Field Border, Wildlife and Restoration of Rare and Declining Habitat plantings, etc.).

Lime and fertilizer should be based on a current soil test (less than four years old). In areas with existing vegetation that shows signs of nutrient deficiencies, or if the soil test shows phosphorus (P) and potassium (K) are in the low to very low range, apply enough fertilizer (organic or inorganic) to raise N, P and K to a level needed for a 1 ton/ac yield goal. Do not apply any nitrogen (N) for warm season grasses. Use Purdue University recommendations from the *Crop Fertilizer Recommendation Calculator* <http://www.agry.purdue.edu/mmp/webcalc/fertRec.asp>, or the Indiana NRCS Seeding Tool – *Indiana Fertilizer Calculator*.

If the pH is 6.0 or less, apply enough lime per acre to bring pH to meet the tolerance range of the planned plant species. Soil amendments will be incorporated during seedbed preparation, or applied before planting if a no-till drill is used. Apply lime according to *Tri-State Fertilizer Recommendations - PU AY-9-32*, Extension Bulletin E-2567, or the Indiana NRCS Seeding Tool – *Indiana Fertilizer Calculator*.

Critical Area Sites: Where soil tests are not feasible such as Critical Area Seedings and Grassed Waterways, an application of 500 lbs. 12-12-12 or equivalent will be used.

For other plantings requiring a dense vigorous grass stand, apply Nitrogen at 50 lbs./ac. if the previous crop was corn or a cereal grain and 30 lbs./ac. if the previous crop was soybean or a legume. Lime, P, and K should be applied at establishment according to a current soil test (less than four years old).

Apply and incorporate all soil amendments during seedbed preparation, or before planting if a no-till planting is used.

Lime and fertilizer (cont.)

Production (pasture/hay) practices: Lime and fertilizer should be applied at establishment according to a current soil test (less than four years old, preferably within the last 12 months). Application rates will be based on Purdue University recommended rates, or the Indiana NRCS Seeding Tool – *Indiana Fertilizer Calculator* within $\pm 10\%$ of a realistic forage yield goal. Do not apply any nitrogen (N) for warm season grass.

Apply and incorporate all soil amendments during seedbed preparation, or before planting if a no-till drill is used.

Site Preparation

It is very important to plant the vegetation into a weed-free seedbed. Use herbicides and/or tillage to eliminate competing vegetation. Weed control efforts should begin as early as 12 months prior to planting, and may require multiple applications or operations in both the fall and spring prior to planting.

Pay particular attention to sites where noxious and potentially invasive species are likely. Many of these species are perennials that spread through seed and roots, and many have rhizomatous root systems that will persist and negatively impact the planting.

Cool season weeds (i.e. - Canada thistle, quack grass) are best controlled in the fall (mid September – Early November) with a translocation herbicide. Plants should be actively growing at the time of application. Avoid herbicide application after 3:00 pm if overnight temperatures are expected to drop below 50 degrees (Fahrenheit).

Warm season weeds (i.e. - Johnsongrass) are best controlled just prior to flower with a follow-up application prior to first frost. Plants should be actively growing at the time of application.

Contact your local Purdue University Cooperative Extension Service for specific herbicides to use.
Apply all herbicides according to the label.

Use a nurse/companion crop to further control potential weed issues and/or a temporary cover for erosion control.

Seed preparation

Inoculate legume seed before seeding with the proper rhizobia bacteria specific for the species. Re-inoculate seed if it was pre-inoculated more than 60 days prior to seeding or beyond dates specified on the seed / inoculant tag. Inoculant left in the sun, even for a short period of time can significantly reduce the viability and effectiveness.

Be aware that blending seed of varying size, shape and weight can make calibration of equipment and seeding uniformity difficult.

Some seeding mixtures contain seed that is extremely small and thus have very low seeding rates. This may make it difficult to set seeding equipment to uniformly seed these low rates of very small seed. Under these circumstances, a **carrier** may be needed to add enough volume to the mix for proper metering. The carrier should be no larger than the largest seed species and have similar shape, density and texture to the majority of the seeds in the mix. The carrier can be an inert material that does not have abrasive properties that may cause damage to the equipment or the seed. Inexpensive seed that will have no significant negative impact on the purpose of the seeding may also be used - vernal alfalfa (unimproved varieties) at 1-2 lbs./ac. is a viable option as a forb/legume carrier.

Planting:

No-Till seeding: Use a no-till drill with 7” or less row spacing. Ensure the drill is designed to handle the type of seed being planted (especially important for native grasses). Set the no-till drill to provide good seed-to-soil contact and a planting depth preferred for the desired species to be planted. Generally this does not exceed 1/4 inch. Seeding native grasses deeper than 1/4 inch will lead to potential failure. Soils that are too wet or too dry can also cause improper seed placement.

Conventional Seeding: Prepare a fine firm seedbed to a depth of 3 to 4 inches. Incorporate lime and fertilizer during seedbed preparation. Use a drill with 7” or less row spacing or a culti-packer seeder designed for the seed to be planted. Grass seed should be drilled uniformly at a proper seeding depth of 1/8 to 1/2 inch.

Broadcast Seeding: Seed may be broadcast if completed in a uniform manner. Pre-mix the seed with 200 lbs. per acre of pelletized lime if using an airflow applicator. Seedbeds should be worked to a minimum depth of 3 inches and firmed before seeding. The seedbed should be culti-packed before and after seeding. It is acceptable to see up to 1/3 of the seed on the soil surface. Wind speed should be 15 m.p.h. or less when broadcasting.

Interseeding:

1. **Legumes/Forbs (frost seeding):** No-till drill or broadcast as above into existing vegetation or residues. Broadcasting relies on freeze/thaw cycles, rain and/or snow to incorporate the seed. Interseeding does not include a seedbed preparation. This is most commonly used during the dormant seeding period in existing grass stands.
2. **Cover Crops:** No-till drill or broadcast as above into existing vegetation or residues. Broadcasting relies on freeze/thaw cycles, rain and/or snow to incorporate the seed. Interseeding does not include a seedbed preparation. This method can be used to establish combination mixes into relatively light (such as soybean) and weed free crop residues or to establish vegetation into a cover crop or standing crops.
3. **Grasses:** No-till drill into existing covers only if prior-treated with herbicides or tillage, or if existing cover is diminishing (i.e. – older alfalfa plantings).

Weed Control During Establishment Period:

Mow, burn, or apply herbicides as needed to control unwanted vegetation for up to 3 years after planting. Mow when competing weeds are taller than the planted vegetation, and at a height above the planted vegetation. Use selective herbicides and/or spot spraying to protect the desired species.

Special Muck Plantings Specifications (Applicable to Indiana Standards 327, 342, 386, 390, 393, & 645)

1. Seeding Specifications for:
 - a. Muck without artificial drainage planted into existing row crops
 - i. Seed the following during the Dormant Season (12/1 – 4/1):
 1. Big Bluestem (Great Lakes Genotype) = 2 PLS pound/acre
 2. Switchgrass (Great Lakes Genotype) = 4 PLS pound/acre
 3. Virginia Wildrye (Great Lakes Genotype) = 5 PLS pound/acre
 4. Riverbank Wildrye (Great Lakes Genotype) = 2 PLS pound/acre
 5. Fox Sedge (*Carex vulpinoidea*) = 0.1 PLS pound/acre (or alternatives)

+

 - 6. Nurse Crop = Oat (@ 30 PLS lb/ac) or Annual Ryegrass (@ 10 PLS lb/ac)
 - b. Muck with artificial drainage planted into existing row crops
 - i. Treat (herbicide) existing weeds and undesirable vegetation in fall
 - ii. Seed a mix with the species from the Indiana Seeding Calculator at the highest rate.

- c. Muck with or without artificial drainage planted into existing un-suitable cover¹
 - i. Treat (herbicide) existing vegetation in spring (mow re-growth in summer)
 - ii. Treat (herbicide) existing vegetation in fall
 - iii. Seed the mix above in Section 1-a during the Dormant Season (12/1 – 4/1)

¹Sites dominated by Reed Canarygrass and/or noxious weeds.

Operation and Maintenance

Noxious weeds and any plant species whose presence or overpopulation may jeopardize the practice, or have detrimental effects to the surrounding land, will be controlled.

If prescribed burning is used to manage and maintain the planting, an approved burn plan must be developed.

Inspect the vegetation annually and after storm events and repair any gullies that have formed, remove unevenly deposited sediment and/or crop residues that will disrupt the function or kill desired vegetation, and reseed high mortality and disturbed areas.

Apply supplemental nutrients as needed to maintain the desired species composition and stand density.

If grazing is used to harvest vegetation, the grazing plan must insure that the integrity and function of the practice is not adversely affected.

Native grasses will not be mowed or grazed lower than 8", and non-native grasses lower than 4".

Limited use of the vegetated area as an access or crossing area, or as part of the planting, cultivating, scouting or harvesting of a crop is acceptable as long as the vegetation or function are not jeopardized.

Follow additional Operation and Maintenance requirements in each appropriate FOTG Standard.

Table 2. Indiana Fly Free Seeding Dates for Winter Wheat

