

## CONVERTING HAY TO NATIVE PRAIRIE OR POLLINATOR HABITAT

This guide outlines the process of planting and managing prairies and pollinator habitat in a former hayfield. Converting areas of non-native grasses to native grasses and wildflowers is difficult and requires significant effort and patience. If you have any questions regarding the planting or maintenance of habitat, please contact:

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### PURCHASING SEED

- When you are establishing a prairie or a pollinator habitat planting through a Farm Bill Program such as the Conservation Reserve Program, Conservation Stewardship Program, Environmental Quality Incentives Program, or the Agricultural Conservation Easement Program (Wetland Reserve Easements), you are required to plant a seed mix that meets the standards and specifications of the program.
- A custom seed mix that meets standards and specifications has been developed for your project. All species substitutions and seeding rate changes must be approved by your Farm Bill Biologist or NRCS District Conservationist before you purchase seed. If changes are not approved, you risk delayed or forfeited payment.
- It is recommended that you get price quotes from at least 3 native seed vendors. Prices vary greatly between vendors.
- The seed vendor list maintained by the Indiana Department of Natural Resources is attached.
- Keep all seed tags and receipts. They will need to be turned in.

### ERADICATING NON-NATIVE GRASSES

- You must plant seed into a vegetation-free, firm seedbed. This is very important.
- If the non-native grasses are not killed, the native grass and wildflower seeds you plant do not stand a chance of competing against them. Non-native, cool season grasses are very aggressive. Native grasses and wildflowers take 1-3 years to mature.
- Converting pasture to native grasses and wildflowers generally takes 2-4 herbicide applications.
- Glyphosate seems to work well. Read and follow all herbicide label instructions.
- Here is a timeline to follow.

1. **In September 2022, cut and bale the hay.**
2. **Let the vegetation reach 6-8 inches and spray the field with glyphosate.**
3. **In March or April 2023, spray the field again with glyphosate if vegetation reaches 6 – 8 inches.**
4. **In May of 2023, spray the field again with glyphosate, if needed.**
5. **Drill the seeds using a no-till native grass drill before June 15, 2023.**



## **GENERAL SITE PREPARATION NOTES**

- You must seed into a vegetation-free, firm seedbed. This is very important.
- Do not till the field if you can avoid it.
- Tillage will cause seeds to be planted too deep. The deepest native grass and wildflower seeds should ever be planted is ¼ inch. The shallower, the better. If you do till, you must use a cultipacker or roller to make the field firm prior to planting.
- Tillage will encourage a significant flush of plants that in some instances could outcompete the seeds you are going to plant. If you do till, you will need to spray the field after firming the seedbed and plants reach 6-8 inches. Read and follow herbicide label instructions.
- If you are about to plant your seeds and you feel that there is heavy plant pressure in the field, stop. Consult with your Farm Bill Biologist. You may need to spray the field or even delay planting until the next planting window. It is best to wait and plant it right the first time than to have to fix it later.

## **PLANTING DATES**

- The dormant seeding window is December 1<sup>st</sup> – February 28<sup>th</sup>. Many native plant species require getting wet and freezing to crack open and germinate. Planting in the dormant seeding window will allow many seeds to germinate the first summer they are in the ground.
- The spring seeding window is April 1<sup>st</sup> – June 15<sup>th</sup>.

## **PLANTING METHODS**

- Drill the seed with a no-till, native grass drill. Drilling is the best method for planting into areas with significant plant residue such as former pastures, lawns, and hayfields.
- Broadcast the seed with a broadcast seeder, fertilizer spreader, drop-seeder, or airflow seeder.

## **PLANTING USING A NO-TILL, NATIVE GRASS DRILL**

- Seeds may be drilled during both the dormant and the spring seeding windows.
- Do not use any random drill. You need to use a drill that was designed for planting native grasses and wildflowers. The seeding mechanisms in the boxes are made specifically for this purpose. These drills are also fitted with depth bands that do not allow the seed to be planted deeper than ¼ inch.
- Large seeds can be placed in the middle box of the drill and small seeds can be placed in the small seed box on the front of the drill or all of the seeds can be mixed with a filler such as cracked corn and placed in the large seed box on the back of the drill.
- After planting, you should see some seeds on top of the ground.
- Since prairie grass and wildflower mixes require low seeding rates and contain very small seeds, a filler should be used to allow more even distribution of the mix across the field. Mix the seed with an inert filler like cracked corn at a ratio of about 1-part seed to 5-parts cracked corn by volume. You can add more filler if needed. For more information, consult the attached Purdue Extension publication on Seed Fillers and Carriers for Planting Native Warm Season Grasses and Forbs.
- It is recommended to start with a low output and increase the seeding rate if needed.
- If time allows, divide the seed in half and go over the field twice, planting half of the seed in a North-South direction, and then planting the other half of the seed in an East-West direction. This will allow even coverage across the field and provide a failsafe if you are seeding at too high of a rate.
- Do not drill in muddy conditions.
- If you need help locating a native grass drill, contact your Farm Bill Wildlife Biologist or your local Soil and Water Conservation District office.



## **BROADCAST PLANTING**

- Seeds may be broadcast during the dormant and the spring seeding windows.
- Seeds can be broadcast using a broadcast seeder, fertilizer spreader, drop-seeder, or airflow seeder.
- Fields should be 70% - 100% bare if seed will be broadcast or dropped on the ground.
- Non-native grass residue can be eliminated by burning it, baling it, or shallow tilling it. If tillage is used to eliminate residue it is strongly recommended to wait until spring to plant to allow for a spring herbicide application to eliminate any weed seeds brought into the germination zone. If residue is burned off the field, you must have a written burn plan.
- If seeds are broadcast in the spring seeding window, the field will need to be rolled or cultipacked before and after the seeding.
- Ground should be frozen or dry enough to get equipment in field without causing ruts.
- Ideally, time seeding prior to a snow or when temperature fluctuations are going to cause the ground to freeze and thaw. The freezing and thawing of the ground will incorporate the seed into the germination zone. If seed is spread on frozen ground and there is no snow or thaw for a while, seed can blow away.
- Since prairie grass and wildflower mixes require low seeding rates and contain very small seeds, a carrier should be used to allow more even distribution of the mix across the field. Mix the seed with an inert carrier like non-clumping, non-scented cat litter or pelleted lime at a ratio of about 1-part seed to 5-parts cat litter or pelleted lime by volume. You can add more carrier if needed. For more information, consult the attached Purdue Extension publication on Seed Fillers and Carriers for Planting Native Warm Season Grasses and Forbs.
- It is recommended to calibrate the spreader with just your carrier before adding the seed mix.
- If time allows, go over the field twice, planting half of the seed in a North-South direction, and then planting the other half of the seed in an East-West direction. This will allow even coverage across the field and provide a failsafe if you are seeding at too high of a rate.
- Do not broadcast seed if the windspeed is higher than 15 mph.



## MAINTENANCE & MANAGEMENT

**Year 1:** Don't expect your planting to look great in Year 1. In fact, it is going to look terrible. During the first growing season, native wildflowers and grasses put most of their energy into root development and many will not grow more than a few inches. Some seeds will sit in the ground for a year or more before breaking dormancy and germinating. Most habitat plantings will look *weedy* during establishment. Annual weeds including ragweed and foxtail are great sources of food and cover for wildlife. These plants typically dominate sites during the first year and are almost never a problem. The weed pressure in most plantings will diminish in year 2. However, if you feel that the weeds in your planting are thick enough to shade out the new seedlings, the site can be mowed in year 1. The site should not be mowed shorter than 12 inches. If you mow the site shorter than 12 inches, you will kill some of the grasses and wildflowers you planted. I recommend consulting with your Farm Bill Wildlife Biologist before mowing.

**Year 2:** You will see many new species the second growing season. Monitor the site for invasive plants such as turfgrass, Canada thistle, reed canary grass, autumn olive, etc. Consult with your Farm Bill Wildlife Biologist if you have questions on invasive plant identification and control.

**Years 3+:** You should be able to find most, if not all the plants that you seeded. Once the vegetation is well-established, you should start managing with rotational disturbance. Prescribed burning is the best management option. Please seek professional assistance prior to burning. Typical burn windows are March 1 to April 1 & August 1 to November 1. Other management options include tillage and herbicide applications. Management should be performed on a 2 to 3-year rotation and limited to 1/2 (2-year rotation) or 1/3 (3-year rotation) of the total area in any given year.



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# SEED FILLERS AND CARRIERS FOR PLANTING NATIVE WARM-SEASON GRASSES AND FORBS



Seeding rates for native warm-season grass and forb mixtures (NWSG) have changed drastically over time. In the past, native grasses were planted without forbs at rates exceeding 10 lbs/ac. This may be ideal from a forage production standpoint, but this created dense stands of native grass with little to no forb component and lacked benefits to most wildlife.

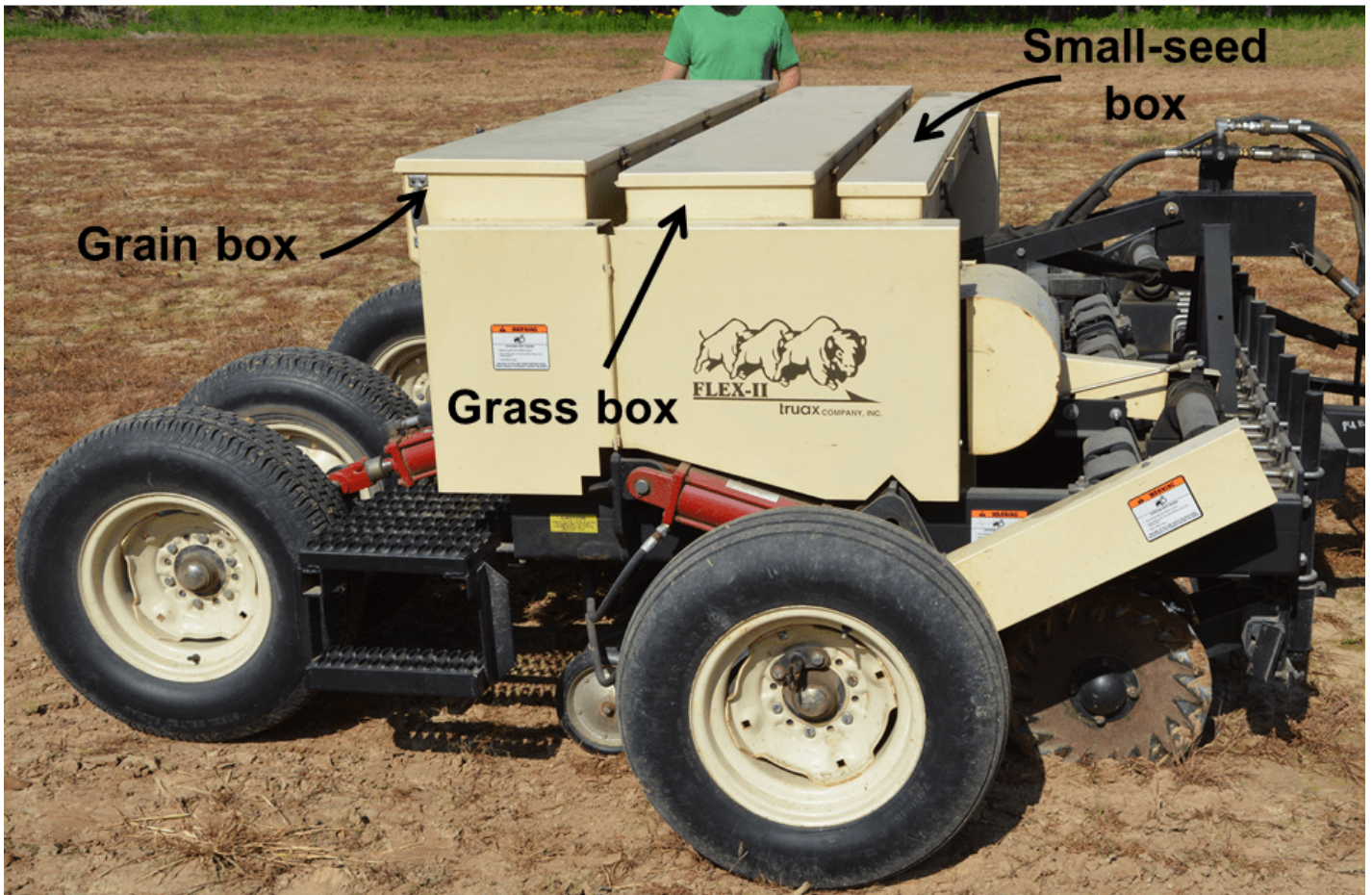
Mixtures have shifted from heavy planting rates of tallgrass species with few forbs to reduced rates of mid-stature grasses with an abundance of forbs. Recommended seeding rates of some current mixtures may be lower than what no-till drills are capable of planting. In this case, **fillers** may be needed to increase the bulk weight of the seed to allow the equipment to plant at the correct rate.

Seed mixtures are also more commonly being established by broadcasting seed during late winter (frost seeding) using cyclone fertilizer spreaders. Broadcasting native warm-season grass and forb seed usually requires the use of a **carrier** to ensure the mixture flows correctly through the spreader and the seed is distributed evenly across the field.

## **Using fillers when no-till drilling native warm-season grass and forb mixtures**

Planting native grass and forb mixtures with a no-till drill is the most common establishment method for NWSG plantings. It may be difficult to achieve the correct seeding rate with a no-till drill because of the combination of reduced bulk weight of dechaffed seed and reduced seeding rates of common mixtures. Fillers can be used to increase the bulk weight of native grass and forb seed if a drill cannot achieve the recommended seeding rate. Traditionally, native grass and forbs have been planted separately using the grass or fluffy-seed box for the native grass seed and the small-seed box for the forbs. However, if the seed has been cleaned and dechaffed it is common for seed companies to mix the seed and recommend it be planted together using the fluffy or grain box on a no-till drill. Fillers can be used when planting native grasses and forbs separately or when planting native grass and forb mixtures. Refer to the chart below for recommended fillers for the different seed boxes of a no-till drill.





**No-till drill planting box**

**Small-seed box**, when planting switchgrass, clovers, or small-seeded native forbs.

**Grass or fluffy-seed box**: when planting big bluestem, little bluestem, indiagrass, or native grass/forb mixtures.

**Grain or large-seed box**: when planting native warm-season grass/forb mixtures

**Recommended fillers**

Cat litter, clay absorbent

Vermiculite

Cracked corn

**Example:**

We are planting a 10-acre field to a native warm-season grass and forb mixture using a no-till drill. The recommended seeding rate is 6 lbs/acre. The seed will be planted with the grain box of the drill, but the drill will only plant a minimum of 10 lbs/acre of our seed mixture.

10 acre field \* 6 lbs/acre bulk seeding rate = 60 lbs of the seed mixture  
 Minimum seeding rate for the no-till drill is 10 lbs/acre = 10 lbs/acre \* 10 acres = 100 lbs

We need to add a filler to increase the bulk weight of the seed mixture to be able to plant at the correct seeding rate. We added a 1:1 ratio (by weight) of cracked corn to our seed mixture:

60 lbs of seed + 60 lbs of cracked corn = 120 lbs of bulk weight for 10 acres

We now need to adjust our bulk seeding rate to account for the added crack corn.

120 lbs of bulk weight for 10 acres = 12 lbs/acre

We need to calibrate our drill to plant 12 lbs/acre in order to plant 6 lbs/ac of our initial seed mixture.

Generally, you should use a 1:1 ratio (by weight) of filler-to-seed, but in some cases you may need to use a higher ratio (e.g., 2:1, 3:1, or 4:1 filler-to-ratio) to achieve the correct seeding rate.

**Using carriers when broadcasting native warm-season grass and forb mixtures**

Broadcasting native warm-season grass and forbs mixtures is most commonly accomplished with a cyclone fertilizer spreader. These spreaders may have issues broadcasting the native grass and forb seed. The 2 main issues are: (1) the seed is not heavy enough to flow through the spreader and (2) the seeds of various size will settle and will not be spread evenly across the field. Carriers will add more bulk weight to the native grass seed and will help ensure the seed stays mixed across the field. Common carriers that are used with native grasses are cracked corn, pelletized lime, wheat, or oats. The recommended rates of common carriers are in the table below:

Carrier	Recommended rate
Pelletized lime	200 lbs/acre
Wheat	40 lbs/acre
Oats	32 lbs/acre
Cracked corn	1:1 ratio of seed-to-cracked corn by weight

Table adapted from the publication *Warm season grass establishment*, Indiana Department of Natural Resources, 2006.



Pelletized lime mixed with native grass and forb seed prior to broadcasting.

#### Example:

We plan to broadcast a native grass and forb mixture on a 10-acre field. The recommended bulk seeding rate is 6 lbs/acre.

$10 \text{ acre field} * 6 \text{ lbs/acre bulk seeding rate} = 60 \text{ lbs of the seed mixture}$

We need to add a carrier to the mixture to increase the bulk weight of the seed mixture. We plan to add 200 lbs of pelletized lime per acre:

$200 \text{ lbs/ac of lime} * 10 \text{ acres} = 2000 \text{ lbs of lime}$

$60 \text{ lbs of seed} + 2000 \text{ lbs of pelletized lime} = 2060 \text{ lbs of bulk weight for 10 acres}$

We now need to adjust our bulk seeding rate to account for the added pelletized lime.

$2060 \text{ lbs of bulk weight for 10 acres} = 206 \text{ lbs/acre}$

We need to calibrate the spreader to broadcast 206 lbs/acre in order to plant 6 lbs/acre of our seed mixture.

#### Conclusions

Planting native warm-season grass and forb mixtures at the correct rate is a critical step in ensuring a successful planting. Using fillers and carriers when establishing native warm-season grasses and forbs can help ensure the mixtures are planted at the proper rates, flow correctly through the seeding equipment, and ensure the seed is spread evenly across the field.

#### Other Resources:

[Pure Live Seed: Calculations and Considerations for Wildlife Food Plots](#), Detailed Resource, Purdue Extension-FNR  
[Calibrating a No-Till Drill for Conservation Plantings and Wildlife Food Plots](#)-video, The Education Store, Purdue Extension  
[Renovating Native Warm-Season Grass Stands for Wildlife: A Land Manager's Guide](#), The Education Store

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**IN DNR - Division of Fish & Wildlife Compiled Native Seed Supplier List - Effective 2-24-2020**

This list is not intended to be all inclusive. Inclusion on this list does not constitute a recommendation or endorsement by the Department of Natural Resources or the Division of Fish & Wildlife. Requests to be added to this list may be directed to [zvoyles@dnr.IN.gov](mailto:zvoyles@dnr.IN.gov) or (812) 352-8486.

SEED SUPPLIERS	Address	City	State*	ZIP	Phone	website
All Native Seed	PO Box 20	Wabash	IN	46992	888-224-2004	<a href="http://www.allnativeseed.com">www.allnativeseed.com</a>
Applegate's Seed House	76 E County Rd 700 S	Brook	IN	47922	219-275-3664	<a href="http://www.applegateseedhouse.net">www.applegateseedhouse.net</a>
BEL Hay Farm Seed Sales	6125 W 550 N	Winamac	IN	46996	574-242-0663	belhay3@hotmail.com
Cardno	128 Sunset Dr	Walkerton	IN	46574	574-586-2412	<a href="http://www.cardnonativeplantnursery.com">www.cardnonativeplantnursery.com</a>
Country Road Greenhouses, LLC	19561 E Twombly Rd	Rochelle	IL	61068	815-384-3311	<a href="http://www.prairieplugs.com">www.prairieplugs.com</a>
Ernst Conservation Seeds	8884 Mercer Pike	Meadville	PA	16335	800-873-3321	<a href="http://www.ernstseed.com">www.ernstseed.com</a>
FDC Enterprises, Inc.	2948 Brookdown Dr	Columbus	OH	43235	866-270-4833	<a href="http://www.fdcenterprises.com">www.fdcenterprises.com</a>
Genesis Nursery, Inc.	23200 Hurd Rd	Tampico	IL	61283	877-817-5325	<a href="http://www.genesisnurseryinc.com">www.genesisnurseryinc.com</a>
Grazing System Supply	1131b Westridge Pkwy	Greensburg	IN	47240	812-663-8588	<a href="http://www.grazingsystemsny.com">www.grazingsystemsny.com</a>
Hamilton Native Outpost	16786 Brown Rd	Elk Creek	MO	65464	888-967-2190	<a href="http://www.hamiltonnativeoutpost.com">www.hamiltonnativeoutpost.com</a>
Heartland Restoration Services	14921 Hand Rd	Fort Wayne	IN	46818	260-489-8511	<a href="http://www.earthsourceinc.net">www.earthsourceinc.net</a>
Lacrosse Seed	PO Box 445	Elwood	IN	46036	800-356-7333	<a href="http://www.lacrosseseed.com">www.lacrosseseed.com</a>
Langdon Bros. Seed	3590 S 100 E	Hartford City	IN	47348	800-526-4366	<a href="http://www.langdonbrosseed.com">www.langdonbrosseed.com</a>
Martin Seed Co.	10045 W 2nd St	Williamsport	IN	47993	765-986-2030	<a href="http://www.martinseed.com">www.martinseed.com</a>
Millborn Seeds	2132 32nd Ave	Brookings	SD	57006	888-498-7333	<a href="http://www.millbornseeds.com">www.millbornseeds.com</a>
Missouri Wildflowers Nursery	9814 Pleasant Hill Rd	Jefferson City	MO	65109	573-496-3492	<a href="http://www.mowildflowers.net">www.mowildflowers.net</a>
Mongo Seed	8385 E 300 N	Howe	IN	46746	260-705-9025	philbieberich@gmail.com
Pheasants Forever/Quail Forever					866-914-7373	<a href="http://www.pfhabitatstore.com">www.pfhabitatstore.com</a>
Prairie Nursery	PO Box 306	Westfield	WI	53964	800-476-9453	<a href="http://www.prairienursery.com">www.prairienursery.com</a>
Quail & Upland Game Alliance	1157 600th Ave	Middletown	IL	62666	812-536-2272	<a href="http://www.quga.org">www.quga.org</a>
Riverview Native Nursery	5635 County Rd 72	Spencerville	IN	46788	260-704-5092	<a href="http://www.riverviewnativenursery.com">www.riverviewnativenursery.com</a>
Roundstone Native Seed, LLC	9764 Raider Hollow Rd	Upton	KY	42784	888-531-2353	<a href="http://www.roundstoneseed.com">www.roundstoneseed.com</a>
Shooting Star Native Seeds	20740 County Rd 33	Spring Grove	MN	55974	888-983-3670	<a href="http://www.shootingstarnativeseed.com">www.shootingstarnativeseed.com</a>
Spence Restoration Nursery	2220 E Fuson Rd	Muncie	IN	47302	765-286-7154	<a href="http://www.spencenursery.com">www.spencenursery.com</a>

\*Out-of-state vendors on this list are limited to those most likely to offer seed suitable for Indiana's climate. Suitability is defined as seed grown within USDA Plant Hardiness Zone 5 or Zone 6 and receiving annual precipitation comparable to Indiana. A vendor's location is not necessarily indicative of seed production source. Checking with all vendors to ensure suitable seed source(s) is highly recommended.