

Iowa Native Prairie Planting Guide



Native Prairie

Increasing forb diversity in native grass-dominated stands

This guide provides strategies on how to add diversity to a native plant community, based on the quality of the existing stand and the objectives of the landowner.

Establishing seedlings in an existing native tall grass-dominated perennial can be difficult. It requires:

1. Terminating or severely setting back existing native tall grasses.
2. Terminating any introduced species present.
3. Controlling plant competition for the prairie seedlings to become established.
4. Selecting the right prairie mixture to ensure long-term success.

Increase your odds for success!

For long-term prairie reconstruction projects, begin by spraying a non-selective herbicide in the fall and continue spraying through the next year. After the second fall, complete a diverse dormant seeding that limits the amount of tall grasses present. The year the ground is fallow, control weeds to deplete the weed bank - not add to it. Cropping the land for 2 years is another effective strategy in lieu of letting the land go fallow for one year.

TAKE INVENTORY

The first step in developing a plan to add diversity to a native plant community is taking an inventory of what is present. **Determine the following:**

1. Native grass species present and % of the stand. (i.e. big bluestem and Indiangrass makes up 90% of the existing stand.)
2. Number of native forbs present and % of the stand. (i.e. 8-10 forbs throughout the seeding, making up about 20% of the stand.)
3. Number of introduced species present and how much. (i.e. smooth brome grass makes up 40% of the plant composition.)
4. Invasive plants present. (i.e. Canada thistles)

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INTERSEED OPTIONS

Interseeding adds diversity to the prairie stand and takes advantage of forbs and grasses already present. However, the existing plants must be set back in order to establish the new seedlings.

Note: Do not use interseed options if introduced plants are > than 30% of the plant community. Choose a strategy that will reduce the introduced plant community.

OPTION 1 - FALL TILLAGE

- » **Advantage:** A dormant seeding can benefit the forb seed by going through cold-moist stratifications.
- » **Disadvantage:** It may stimulate thistle growth, introduced legumes and annual weeds.

Steps

1. **Mow or hay stand in late summer or fall.**
 - Mowing will make it easier for the sod to be disked but won't be as advantageous as the removal of the vegetation prior to disking. *Prescribed fire or grazing could also be completed in lieu of mowing or haying.*
2. **Complete tillage in fall.**
 - This will require a heavy disk and multiple trips (up to 6 passes).
 - * Consider placing the wings of the disk up for the first two passes.
 - * It may be beneficial to complete a couple passes and then let it dry out before completing additional trips.
 - 50% or > soil should be exposed.
 - A good seedbed is important. A person should be able to walk and drive across it.
3. **Seed in dormant season (after Nov. 15 and prior to freeze so rolling can be performed)**
 - Roll area to firm the seedbed. A footprint should not be > 1/8" deep!
 - Broadcast and roll or drill prairie seed.
4. **Mow as necessary.**
 - Mow when the average height of the tall native grass component is 12" tall and/or annual weeds reach knee high.
 - * For first mowing, set mower height at 3-4".
 - * Much of the native tall grasses will not be visible in the first mowing.
 - Increase the mower height to 6-8" after the first mowing. Mow at least three times during the first growing season.
 - In the 2nd year, the tall grasses present prior to disking will come on strong. Additional mowing in the 2nd year is critical. *Root reserves are low*



MANAGEMENT TIP 1: Use Grass Selective Herbicides (AC Case Inhibitors)

The labels have perennial grass rates. This class is overall poor at killing established perennial grasses; however, these herbicides will temporarily set the perennial grasses back if sprayed when the perennial grasses are actively growing.

Good coverage is needed. **For best results, spray in late spring for cool season grasses and early to mid-summer for warm season grasses.**

Grass selective herbicides can be used to limit mowings when interseeding into native tall grass-dominant stands.

Caution: In the first year following seeding, think of the seeded native grasses as annuals. The grass select herbicide will kill the native grass seedlings until they are fully established.

for the tall grasses coming back, so mowing at this time can be very effective.

Note: If tall grasses are beginning to compete for space, apply a grass selective herbicide when the tall native grass component is actively growing in lieu of some of the mowings.

Caution: This will kill any new grass seedlings!

OPTION 2 - PRESCRIBED BURN AND SEED

- » Recommended for small areas only (1-2 acres) and where the landowner can mow often.

2a. Burn first, then seed

Steps

1. Complete a fall or dormant prescribed burn.
2. Complete the seeding by broadcasting or drilling by Feb. 15 to give time for the forb seed to be stratified.

2b. Seed first, then burn

Steps

1. Broadcast or drill the seeding into the existing stand in the dormant season.
2. Complete a prescribed burn at the end of dormant season.

Note: The seed needs time to be worked down through the plant material and duff layer by the snow and rain before completing the prescribed burn. Seed on the soil surface is < exposed to the prairie fire. A way to demonstrate this is to place toothpicks and/or marshmallows on the soil surface before completing the prescribed fire. In many cases, the toothpicks will be lying there uncharred and the marshmallows unmelted.

2c. Hay/Graze, then seed (no burn)

Steps

1. In the fall, hay or graze to reduce the duff layer.
2. Broadcast seed if 50% of the soil is exposed, otherwise complete the seeding using a drill in the dormant season.

For all three scenarios above:

3. Mow
 - Mow 1st at 3-4" in height when the average height of the tall native grass component is 12" tall.
 - Continue mowing as the tall grass reaches 12-15". Increase the mower height to 5-6" after the 1st mowing.
 - For seedlings to survive, mow 5 to 6 times.
 - Mow a minimum of 2 to 3 times during the second year.

Note: Apply a grass selective herbicide when the tall native grass component is actively growing, in lieu of some of the mowings. Caution: This will kill any new grass seedlings!



Removing the duff layer with prescribed burning.

MANAGEMENT TIP 2: Reduce the Duff Layer

Duff layers (litter), which provide the fuel for prairie burns, can impede the seed-to-soil contact necessary for successful seedings. Typically, a prairie burn is only done once a year; it takes that amount of time to build up the needed duff layer before a fire can be carried out.

Prescribed fire, haying, and grazing are all effective at reducing the duff layer. Some duff layer can be beneficial to keep the soil surface

from drying out and seed desiccation. The goal is to have 50% or > of the soil surface exposed when broadcasting for a prairie seeding. Drilling can tolerate a duff layer better than broadcasting.

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TERMINATE & RESEED OPTIONS



Note: Options listed below require a full seed mix. The NRCS Conservation Practice 327 standard requires 40 seeds/ft².

OPTION 1 - FALL AND SPRING GLYPHOSATE HERBICIDE APPLICATION

- » Consider when the introduced plant community is > than 50% of the plant composition.
- » Refer to Iowa Native Prairie Planting Guide - Planting Native Prairie into Cool Season Sod.

OPTION 2 - FALL HERBICIDE ONLY

Note: Consider this option when the introduced plant community is < than 50% of the plant composition.

Steps

1. **Late July – Early August: Mow or hay the native grass stand.**
 - Mowing at 6–8” of height will help to ensure the regrowth needed before spraying.
 - * Mowing at 3” can be advantageous if you are not following up with a prescribed burn to reduce the duff; but you risk not getting the needed regrowth when conditions are dry. Mow 3-4” when introduced grasses are the primary concern.
 - * For CRP, you can't mow until Aug. 2.
2. **Aug. 25 – Sept. 15: Spray glyphosate**
 - Warm season grasses will go dormant in early fall. Wait for 6–8” of new regrowth before spraying.
 - 2 quarts/acre when the active ingredient is 41%. (Follow label instructions.)

- If the site is not mowed, the native grasses will become dormant sooner. Spray by Sept. 10. *It is difficult to get herbicide coverage without mowing first.*
- If Canada thistle, perennial introduced legumes, or other hard to terminate exotic species are present, increase the application rate based on label instructions.
- If introduced species are an issue, spray closer to the Sept. 15 date.

Steps

3a. Burn first, then seed

1. Complete a fall or dormant prescribed burn.
2. Complete the seeding by broadcasting or drilling by Feb. 15 to give time for the forb seed to be stratified.

3b. Seed first, then burn

1. Broadcast or drill the seeding into the existing stand in the dormant season.
2. Complete a prescribed burn at the end of dormant season.

Note: The seed needs time to be worked down through the plant material and duff layer by the snow and rain before completing the prescribed burn. Seed on the soil surface is < exposed to the prairie fire. A way to demonstrate this is to place toothpicks and/or marshmallows on the soil surface before completing the prescribed fire. In many cases the toothpicks will be lying there uncharred and the marshmallows unmelted.

3c. Hay/Graze, then seed (no burn)

1. In the fall, hay or graze to reduce the duff layer.
2. Broadcast seed if 50% of the soil is exposed otherwise complete the seeding using a drill in the dormant season.

MANAGEMENT TIP 3: Apply the Right Amount of Tall Native Grass Seed

Iowa tall native grasses (i.e. Big bluestem, Indiangrass, & switchgrass) are an important component to our tallgrass prairie. They should always be present, but limit the amount in our seedings to ensure the forb component can become established.

Tall grasses establish quickly and can take over space before the forbs take hold. Once forbs are established, they will compete in the stand with good management.

Recommendations: Use 0.1 lbs. (1.6 oz. or 0.4 seeds/ft²) to 0.25lbs. (4 oz. or 1.0 seeds/ft²) each for each of the tall grasses. Spring seedings favor the tall grasses, whereas a dormant seeding favors forbs. Drilling favors the tall grasses, while broadcasting on the surface to a 1/8” depth favors forbs.

When broadcasting in the dormant season, seed .25 lbs. (4 oz.)/ac or 1.0 seeds/ft² of each.

For all three scenarios:

4. Mow
 - Mow 1st at 3-4" in height when the average height of the tall native grass component is 12" tall.
 - Continue mowing as the tall grass reaches 12-15". Increase the mower height to 5-6" after the 1st mowing.
 - Mow a minimum of 2 to 3 times during the second year.

Note: Apply a grass selective herbicide when the tall native grass component is actively growing, in lieu of some of the mowings. Caution: This will kill any new grass seedlings!

OPTION 3 - SPRING HERBICIDE ONLY

- » This is an option when prairie forbs are present and the introduced plant community is < 30% of the plant composition.
- » The prairie plants present are expected to return with this option, but full seeding is still recommended.

Steps

1. Remove duff layer by fall mowing, or hay/graze or prescribed burn to existing stand.
 - Do not mow in the spring. It will create a thick duff layer.
2. Spray in late Spring
 - Wait for 6-8" of new growth on the native tall warm season grasses, then spray glyphosate (2 quarts/acre when the active ingredient is 41%), during the 3rd week of May or later.
3. Drill prairie mix
4. Mow
 - Mow 1st at 3-4" in height when the average height of the tall native grass component is 12" tall and/or annual weeds reach knee high.
 - Increase the mower height to 5-6" after the first

mowing.

- Additional mowings during the 2nd year will aide in seedling establishment.

ORGANIC TRANSITION OPTIONS

Steps

1. Plow introduced plant community, August-October.
2. Use Disk/Soil finisher twice in early spring.
 - Complete necessary tillage to create a good seedbed. It should be relatively smooth to drive over.
3. Seed 3 bushels of oats/acre.
4. Evaluate the seeding area in September.
 - Check if the introduced plant community is coming back or if thistles and other potential problem weeds are present.
5. Complete tillage before seeding.
6. Roll area to make a firm seedbed; a footprint should not be < than 1/8" deep.
7. Complete a dormant seeding.
8. If a spring seeding is completed, add a bushel of oats to the seed mix for soil erosion control.
9. Mow
 - Mow 1st at 3-4" in height when annual weeds reach knee high.
 - Increase the mower height to 5-6" after the first mowing.
 - Additional mowings in the 2nd year will aide in the establishment of the seedlings.

Note: A spring seeding could be completed after the spring disking if seedbed conditions are good.

MANAGEMENT TIP 4: Cold-Moist Seed Stratification Technique for Spring Seedlings

Most prairie forbs (flowers) show improved germination with cold-moist stratification. By planting in the dormant season (Nov. 15 - April 1), Mother Nature completes the process for us. It is best to have the dormant season planting completed by March 1, if possible, but no later than April 1.

With a spring planting, it is possible to replicate what Mother Nature does. In a seal-able plastic bag, mix the prairie seed with equal parts of moist

(not wet) sand and refrigerate at 34-38 degrees (do not freeze). Most flowering species will need 3-4 weeks of treatment.

Keep the treated seed moist to survive. Therefore, time the seeding when spring rains are forecast and temperatures cool to keep the soil from drying out. It may be advantageous to do this to half of the seed to increase overall odds of success.

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SEED MIX CONSIDERATIONS



WHEN INTERSEEDING:

MINIMUM REQUIREMENTS

- » Less than full seeding is required. The NRCS 327 Conservation Cover Practice Standard calls for a minimum of 25% of a pure stand.
- » A minimum of 20–30 forb seeds/ft² is recommended.
- » For CRP, refer to the seed plan to make sure the requirements are met for the practice.

OTHER SEED CONSIDERATIONS

- Inventory the existing stand. Know what species are present in the stand to determine additional species to seed to increase the overall diversity.
- Consider adding native grass species (cool and warm season) and sedge species not present in the stand (i.e. little bluestem, side oats grama, Canada wildrye, prairie Junegrass, dropseed species).
- Do not add any tall grass species already present in the stand, as they will return (i.e. big bluestem, Indiangrass, and switchgrass).
- Spring Seedings - Half of the forb component should be species which require little to no cold-moist stratification. These include the native legumes (i.e. Illinois bundle flower, white and purple prairie clover, lead plant, partridge pea, milk vetch, indigo species, showy and Illinois tick trefoil), aster species, black-eyed susan, wild bergamot, mint species, fragrant cone flower (i.e. sweet brown-eyed susan).

WHEN STARTING OVER:

MINIMUM REQUIREMENTS

- » Seed a minimum of 40 seeds/ft² mix. (NRCS 327 Conservation Cover rate). *This assumes the native grass stand is eradicated.*
- » Recommend 20-30 forb seeds/ft².

- » For CRP, refer to the seed plan to be sure the requirements are met for the practice.

OTHER SEED CONSIDERATIONS

- » Keep the native tall grasses in the seedings. Use 0.1 lbs. (1.6 oz. or 0.4 seeds/ft²) to 0.25lbs. (4 oz. or 1.0 seeds/ft²) each for Big Bluestem, Indiangrass, and Switch Grass to ensure they won't dominate the stand.
- » For Option 3 - Spring herbicide only
 - Do not add tall grass species already present in the stand, as they will likely return (i.e. big bluestem, Indian grass, switchgrass).



Photo by Stacy Wickman

MANAGEMENT TIP 5: Preparing the Site Through Grazing

Grazing is an excellent option when available! Overgrazing the native stand in late summer and fall will set back the existing plant community; thus, giving the added prairie seeds the best chance of becoming established.

Complete the seeding in the dormant season. You will see annual weeds come into the stand the following season. That is OK. Then you will know you have set back the native tall grasses. Mow as needed to make sure light is reaching the new seedlings. Tall grasses will come back in full force in the 2nd season.

PRAIRIE SEEDING METHODS

DORMANT (Nov. 15 to April 1) vs. SPRING SEEDINGS (April 1 to July 1)

Dormant seedings favor the forb component. Most native prairie forbs benefit from going through freeze and thaw cycles that will scarify the seed coat, allowing them to germinate.

The amount of cold stratification varies with species. For example, Prairie cordgrass requires 120 days of cold stratification. Other prairie grasses, native legumes, asters, and black-eye susan, on the other hand, do not require it.

While species requirements differ, planting by Feb. 15 will be sufficient for most forbs. Seedings are often successful in the spring or early summer, but this may be due, in part, to some of the forb species not germinating until the 2nd season. When adding diversity to an existing stand, you may not have the luxury of waiting until the 2nd season before germination. It becomes difficult to keep the existing stand setback for the new seedlings to take hold.

DRILLING vs. BROADCASTING

Place forbs near the surface to a 1/8" depth. Drill native grasses to 1/8" to 1/4" deep. Drilling reduces seed predation.

When broadcasting seed, it is best to have 50% of the soil surface showing. Drilling creates a cut in the residue, so it can tolerate a heavier duff layer.

Removing every other hose off the forb box is recommended when using a prairie drill. This will allow the forb seed to drop on the ground on half the rows. Stay shallow when drilling!

MANAGEMENT TIP 6: Glyphosate on Perennials

Glyphosate is not as effective at killing perennials in the spring as it is in fall. It is also less effective at killing perennial forbs compared to perennial grasses, overall. This works in your favor! It will set back the native grass component harder than the native forbs when spring-applied.

MANAGEMENT TIP 7: Dormant Prescribed Fire

Prescribed fire can be advantageous in late fall and during the dormant season, but late fall fires can come with greater risk and can be difficult to complete.

Do not complete fall burns when unharvested crops are in the area. Dormant burns happen at a time when herbaceous plants are brown. Cool season firebreaks will not be as effective at slowing the fire. Often, during dormant burns, nighttime temperatures can be below freezing, which means all tanks, pumps, etc. must be housed in a heated facility or drained.

When completing prescribed fires in early spring, the ground will often be soft which can be challenging for driving trucks and water tanks. When completing any prescribed burn, complete a Prescribed Burn Plan.

The NRCS 338 Prescribed Burning Job Sheet is a good resource for developing a prescribed burn plan.

FINAL THOUGHTS: SUCCESSION

“*Prairie plant succession is a continuous process. I often hear one of two different scenarios. The first is, ‘I really liked the gray-headed coneflower stage, what happened to it?’ Or, we ‘have too much rigid goldenrod, how do we get rid of it?’ Monocultures give us what we have planted. Prairies give us endless variations depending on age, species diversity, soil type, and weather conditions. That’s what makes prairie so magical.*”

— Carl Kurtz, Writer, Teacher, Naturalist, Photographer of the Tallgrass Prairie



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Establishing and Managing Native Prairie
Planting Native Prairie into Cool Season Sod
Planting Native Prairie Into Corn or Soybean Stubble

