

Prairie Grassland Habitat Management



HISTORY

The warm season grasses, such as big bluestem, little bluestem, Indiangrass and switchgrass, and flowers recommended in this publication are a part of Ohio's prairie grassland history, which began about 4,000 to 6,000 years ago. The dry climatic conditions that prevailed after the last glacial period favored the expansion of the western prairies eastward into Ohio. Later, as the climate became more humid, hardwood trees invaded from the east. The prairie, with the aid of fire, held off the advance of these trees for a period; however, by the time of pioneer settlement, western Ohio prairies were fragmented into islands surrounded by forest. When these prairie islands were discovered by pioneer farmers, they were quickly converted to cropland and pasture.

Today, less than 1 percent of Ohio's original prairie remains. In fact, there are currently fewer acres of native prairie than native wetland; it is the most endangered natural landscape in Ohio. As a result, many species of wildlife that once occurred in Ohio are now extirpated, such as that prairie chicken and woodland bison. Moreover, many grassland birds have also declined in recent years due to the lack of grassland habitat. Refer to Table 1 for information on the species of grassland birds that occur in Ohio and their specific habitat needs. These birds have adjusted to the loss of prairie by adapting to the non-native surrogate pastures and hayland planted by farmers. However, these habitats are also in short supply and those that do exist are either not large enough to accommodate most grassland bird species or are managed in a way that discourages use by most species.

Why plant prairie grass as opposed to the typical non-native cool-season grass such as bluegrass, orchard, and brome grass? First, native grassland wildlife species are better adapted to living in a mixture of native grasses and flowers. Second, those same grasses and flowers are better adapted to the soils, weather, and other biological and physical conditions found in Ohio. Third, to plant prairie is to restore a priceless part of Ohio's natural history.

Table 1. Population status and trends and habitat needs of grassland birds known to breed in Ohio.

SPECIES	POPULATION STATUS & TRENDS	AREA SIZE NEEDS*	VEGETATION HEIGHT NEEDS	GRASS:FORB RATIO NEEDS
Upland Sandpiper	Threatened	High	Short	Medium
Bobolink	Declining	High	Mid-tall	Medium
Eastern Meadowlark	Declining	Moderate	Short-mid	Medium
Dickcissel	Declining	Low	Mid-tall	Low
Savannah Sparrow	Stable	High	Short-mid	Medium
Grasshopper Sparrow	Declining	Moderate	Short-mid	Medium
Henslow's Sparrow	Special Interest 1	High	Tall	High
Vesper Sparrow	Stable	Low	Short	Medium
Sedge Wren	Stable	Moderate	Tall	High
Northern Harrier	Endangered	Extreme	Tall	High
Short-eared Owl	Declining	Extreme	Tall	High
Ring-necked Pheasant	Low	Low	Mid-tall	High
Bobwhite Quail	Low	Low	Mid-tall	High
Red-winged Blackbird	Declining	Low	Tall	Medium

* Area size: Low = 0 to 25 acres, Moderate = 25 to 50 acres, High = 50 to 100 acres, Extreme = > 100 acres

WARM SEASON GRASSES

INTRODUCTION

Two major groups of grasses occur in Ohio: cool season and warm season. Cool season grasses are nonnative grasses such as timothy, orchardgrass, and brome grass and begin growth in the cool, wet, early spring. They reach maturity by early summer if not mowed, pastured, or harvested. During the hot summer months, cool season grasses lose their vitality and decline rapidly. Any farmer who manages a pasture

knows that the forage quality of cool season grasses declines as the summer progresses and increases again in fall with the return of cooler, damper weather.

Warm season grasses begin growth much later in the spring. They do not reach full maturity until late summer or early fall. Consequently, warm season grasses can produce high quality livestock forage during the hot summer months when most cool season grasses lie dormant. Refer to *Pasture/Hayland Management for Wildlife and Livestock*, Publication 388.

Many species of cool season and warm season grasses provide excellent habitat for wildlife. Each grass type has its advantages and disadvantages. Cool season grasses such as timothy, bromegrass, and orchardgrass are much easier to plant than warm season grasses, but they need to be mowed and/or sprayed more often to stop the invasion of unwanted plants. Eventually, even with periodic maintenance, cool season grass fields have to be replanted to maintain a healthy grassland nesting habitat for wildlife.

In contrast, most warm season grasses supply high quality nesting cover without the need for costly maintenance practices such as mowing and spraying. If managed properly, an established warm season grass stand is more or less self-sustaining.

Warm season grass mixtures and forbs (wildflowers) provide excellent year round habitat for wildlife. The diversity of grasses and flowers provide grassland dependent wildlife – such as ring-necked pheasants – with nesting, brood-rearing, escape and winter cover. By establishing plants of varying heights, landowners also create structural diversity which is also very attractive to wildlife. Refer to Table 1.

Warm season grasses are more expensive than non-native cool season grass seeds and native grasses tend to germinate and develop more slowly than cool season perennial grasses. Warm season grasses may not grow much taller than 6-10 inches the first year. In most first-year stands, weeds will be more evident than grass. Generally, one plant per square foot will establish a good stand the second year. Full maturity can be expected the third year.

ESTABLISHMENT

To properly establish warm season grasses there are some key requirements. Start planning as soon as possible. In most cases, one-year advance planning will allow for the proper seedbed and correct herbicide use. Soybean stubble is the best seedbed for no-till drilling warm season grasses. Corn stubble and dead sod are also okay, but avoid wheat stubble because it prevents germination in warm-season grass seeds. Certain herbicides should not be used the previous year. Any soybean herbicides that have restrictions for corn the following year should not be used.

Because the seed is very light, hairy and fluffy, the best results are obtained by using a specialized drill

to no-till plant. These rangeland drills are available in many counties through the SWCD's or *Pheasants Forever* Chapters.

Another key requirement to establish warm season grasses is to eliminate the competing vegetation the first year. The initial herbicide burndown is critical. As the first year progresses, mowing and/or the use of herbicides is important to keep the competing vegetation in check. Most first-year competition will consist of such weeds as foxtail and ragweed.

The hardest requirement for establishing warm season grasses is patience. Since the seed does not germinate until soil temperature reaches 55°F, do not expect to see any seedlings until late June. First year growth may only be 6-10 inches. As mentioned earlier most warm season grass fields require three years to mature.

The following guidelines should be followed regardless of seeding method:

- Determine the soil fertility. A soil pH of 6.0 or greater is recommended for warm season grass. Do not apply nitrogen the first year as this will only stimulate competition from weeds and cool season grasses. Apply phosphorus and potash if required per soil test recommendation.
- Match grass species and variety to soil type, moisture gradient, and geographic region. For example, switch grass can be planted in wet soils on a flat gradient, however Indian grass should be planted on a mid-slope in well-drained soils.
- Seed November 15 – June 15.
- Seed should be planted no deeper than ¼ inch. It is better to have seed on top of the ground than to have it be ½ inch deep.
- Firebreaks of cool season grasses should be planted in strips 30-50 feet wide around the prairie and between the prairie and buildings, roads, and other fire hazards. These strips should be mowed once a year after August 1.
- When broadcast seeding, it is recommended to increase the seeding rate by 50 percent. Use a mixture of warm season grass and forb seed, and a companion crop such as oats. A commercial Air Seeder has shown good results.
- Companion crops are required on highly erodible ground. Companion crops may be:
 - A. *Canadian wild rye - 4 lb./acre
 - or B. *Oats - 1 bushel/acre
 - or C. Sorghum – 7 lb./acre

*Do not use with Plateau herbicide.

Do not use wheat or fall rye as a companion crop.

- Check your herbicide history. Certain soybean herbicides such as SCEPTER™, SQUADRON™, and TRISCEPT™ have label warnings against planting corn the following year. This applies to warm season grasses also.

- Plateau™ herbicide may harm switchgrass, and eastern gamagrass in the establishment year.

The following planting guidelines have been developed to assist landowners, depending upon if a rangeland drill is available and the current seedbed.

If a rangeland (i.e. Great Plains™, Truax™) drill is available and seedbed is a crop stubble . . .

Kill the competing vegetation. Round-up™ and 2,4-D have shown good results. This may be applied 2-4 days after planting. In addition, an application of Plateau one week after planting will ensure even better weed control. If using Plateau, be sure to use sorghum as a companion crop – especially on highly-erodible land. If Plateau is not used, then any competition should be mowed before going to mature seed, but prior to July 1. Set the mower height to just above the warm season grasses (i.e. 6-10 inches). Do not mow after July 1 unless the mower height can be set above the warm season grasses.

If planting into sod with a Rangeland Drill . . .

Mow grass stand during late summer (i.e. August) in the year prior to planting. Apply 1 quart/acre of Round-up™ 4 to 6 weeks after mowing and/or when the grass is 8-12 inches high. For a spring application, apply 2 quarts/acre 5-6 days prior to planting seed. A companion crop is not required. As with row plantings, Plateau herbicide or mowing is suggested to eliminate competition.

If a Rangeland (Truax Drill) is not available . . .

Kill existing vegetation with Roundup and/or 2,4-D. Disk ground 2 inches deep. Cultipack (roll) to a firm, fine seedbed. The field is ready to plant if your footprint does not go deeper than ¼ inch.

A BROADCAST SEEDING requires a 25-50 percent higher seeding rate. The seed should be mixed with a companion crop, such as oats or sorghum. An air seeder can be used for this broadcast application. Air Seeding is a fast and efficient method of seeding large fields. Air seeders blow seed on top of the soil from booms rigged on a truck. The major advantage to using air seeders is that they can handle a variety of seed sizes and do not clog. Cultipack (roll) field three times after the field is seeded to ensure good seed-to-soil contact. One week after planting, apply Plateau herbicide. If Plateau is not used, then any competition should be mowed before going to mature seed, but prior to July 1. Set the mower height to just above the warm season grasses (i.e. 6-10 inches). Do not mow after July 1 unless the mower height can be set above the warm season grasses.

DEBEARDED SEED – Another option available for landowners that cannot locate a rangeland drill is to purchase debarbed warm season grass seed. The debarbing process removes the hairs from the seed.

This process allows for planting with conventional drills. Seed depth at planting should still be no more than ¼ inch with debarbed seed.

Table 2. Prairie grassland seeding mixtures and rates for wildlife habitat (per acre).

Predominately Upland or Well-drained Soils		
SPECIES	VARIETY	LBS. PER ACRE
Big Bluestem	Rountree	2
Indiangrass	Rumsey	2
Little Bluestem	Aldous	1.5
Sideouts grama	El Reno	1
Plus forbs	Wildflowers	0.25

Predominately Wet Soils and/or Floodplains		
SPECIES	VARIETY	LBS. PER ACRE
Big Bluestem	Rountree	2
Switchgrass	Blackwell	2
Indiangrass	Rumsey	2
Little Bluestem	Blaze	1
Plus forbs	Wildflower	0.25
Eastern gamma grass	Native (plant alone)	8-10

WARM SEASON GRASS MAINTENANCE

Warm season grass fields can be enhanced in the second and third years by controlled burns. Only trained personnel should conduct these burns. The purpose of the fire is to remove the previous year’s residue, control competing vegetation, and allow the ground to heat up quicker, thus encouraging the warm season grasses.

These burns should be planned for March 15 – May 15. If woody vegetation is a problem, try to burn as late as possible or mow in January and February, followed by a spot herbicide application. Mowing should not be done on established warm season grass fields after February. You must contact the Division of Forestry and your local fire department, as well as Ohio EPA to obtain permits for burning prairie. Mowing is an alternate to burning for maintaining prairie. Mow once every three years in early spring. Do not mow more than 25% of your total grassland in any year.

Long-term maintenance should be minimal. Another controlled burn should be conducted when the grass stand becomes thick, usually in the fifth to seventh year. Again, it is very important to remember that the establishment of warm season grasses is a very slow process, often taking two or three years. Strict adherence to management guidelines is required.

Misjudging the stand and applying the wrong management can destroy it. But once established, minimal maintenance is needed to retain high quality nesting cover.

GRASSLAND BIRD MANAGEMENT PRINCIPLES

1. Bigger is Better! Most grassland birds require large unbroken blocks of undisturbed habitat, especially for nesting.
2. Create a variety of grassland successional growth stages (field edge) that provide a diversity of structural characteristics - height, density, and open ground and plants types.
3. Minimize tall (taller than 15') verticle woody edges around fields.
4. Minimize hard edges between habitats by allowing adjacent habitats to blend softly into one another. For example, allow a food plot to blend into the adjacent grass field, by not mowing between them. Predators find nests easier when fields are small and have hard edges.
5. Woody cover should comprise less than 5% of grassland. A few scattered trees less than 15' tall are beneficial as singing perches.

NATIVE PRAIRIE GRASS MIXTURE

Little Bluestem

(3 ft - 4 ft.) was originally the most abundant of all native grasses. It grows well on deep, shallow, sandy, fine textured or rocky soils in either upland or lowlands. It is a favored reclamation and landscaping plant. This grass ranks high as pheasant and quail nesting cover, but like Big Bluestem, it flattens under heavy snows and makes poor winter cover.



Sideoats Grama

(18 in. - 3 ft.) A good seed producer, Sideoats Grama can be found on well-drained soils and even in rocky areas. It is considered excellent for conservation use and grows well due to vigorous seedling production. Perennial, but on less than favorable sites it will not persist.



Indiangrass

(5 ft. - 7 ft.) Because of an exceptionally deep root system, Indiangrass does well even in drought conditions. It is suited to most soils, but does best on well-drained soils. It is widely used in roadside revegetation, reclamation. It has value for grazing and wildlife



habitat, but until recently has not been used much for grazing; information is still needed. Like Switchgrass, it stands up very well to heavy snows, so it is also valuable as a winter cover.

Big Bluestem

(5 ft. - 7 ft.) is recognized for its rapid growth, especially in mid to late summer. It is winter hardy and suited to almost all soil types. Big Bluestem is a favored grass for reclamation on even the poorest of sites. It provides highly palatable and nutritious forage for cattle and excellent wildlife nesting cover.



Many observers feel that songbirds prefer this to all other warm season grasses. However, Big Bluestem tends to flatten down under heavy snows, so it has minimal value as winter cover

Canada Wild Rye

(3 ft - 5 ft.) Sometimes called Nodding Wild Rye, this is a native, cool-season perennial prairie grass that is best adapted to lowland soils, but grows on most all types of soils and moisture gradients. It is best used in a prairie mixture as a cover crop, especially on highly erodible sites. Canada Wild Rye is very palatable, nutritious and is readily eaten by livestock and wildlife.



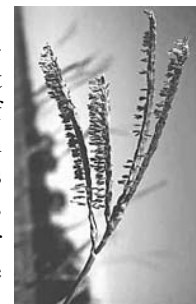
Switchgrass

(4 ft. - 5 ft.) is widely used for soil conservation, pastures and hay production. It is best adapted to lower areas of moist soils, but is also drought resistant and winter hardy. Several new varieties have been developed which are rust resistant. It's the earliest maturing of the native warm-season grasses. Its high yield capability is well documented; many instances of switchgrass yielding four (4) tons per acre of forage in one cutting with high amounts of regrowth before frost, are common. This grass stands up well to winter snows, thus furnishing good winter cover for pheasants, songbirds and small mammals.



Eastern Gamagrass

(3 ft. - 9 ft) Deep, wet and non-alkaline soils favor its development and it tolerates extended periods of flooding. Clump grass that can reach 1 to 4 feet in diameter. Provides nesting and winter cover. Begins spring growth earlier than the other warm-season grasses. Seeds are large, which requires a grain drill for planting



Blue-joint Grass

(2 ft. - 5 ft.) occurs primarily in heavy clay soils and on wet moisture gradients. It is usually found alone in large patches or mixed with stands of prairie cordgrass. Blue-joint grass is an excellent nesting cover for waterfowl, and should be planted along the edge of wetlands. Plant plugs for best results.



Prairie Cordgrass

(6 ft - 10 ft.) is a native, sod-forming perennial that grows in the wettest part of the prairie. In fact, prairie cordgrass will grow where water stands a few inches deep in the Spring. It is often used to control soil erosion in waterways and along shorelines. Prairie cordgrass provides nesting cover for waterfowl and wetland songbirds such as the sedge wren and red-winged blackbird. Plant plugs for best results.



All Purpose Prairie Wildflower Mix

The following mixture of prairie wildflowers is fairly adapted (hardy) to a variety of soil types and moisture conditions.

Purple coneflower, prairie coneflower, prairie dock, black-eyed Susan, partridge pea, round-headed bush clover, rosinweed, stiff goldenrod, sawtooth sunflower, tall coreopsis, prairie blazing star, stiff tickseed, New England aster, heath aster.



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