

Planning is the key to a successful native grass stand. Native grasses must be seeded differently than introduced grasses. Most native species are slow to establish and do not compete well with other establishing plants (weeds). The use of named grass cultivars is recommended for most plantings because they have been selected for better establishment and forage production characteristics. Species and cultivar selection, site preparation, seed quality, seed source, seeding date, and other factors must be considered to ensure the successful establishment of a native grass stand.

Native grass seedings can take up to 4 years to become fully established. To ensure seeding success, careful planning is essential. Technical assistance can be obtained from the local Natural Resource Conservation Service, county Research and Extension office, wildlife agencies, and commercial seed companies.

Planning for Seeding

Good planning requires an assessment of resources (including soil type and current and past cropping uses), expected problems (including existing weed problems and potential cropland herbicide carry-over), necessary changes in the farming operation, equipment available, seed sources, intended use of the seeded area, costs and returns anticipated, and suitability for wildlife habitat. The planning should result in a seeding work plan.

Soils

The first step to seeding an area begins with an inventory of the soils. It is important to know the soil type and its present condition to determine what species can best establish a permanent cover for the intended use. Previous cropping history (particularly herbicide use) is necessary to prevent seedling damage from herbicide carry-over. Seedling damage can result from long-residual herbicides, particularly those used for grass control. Short-residual herbicides are less likely to injure seedlings unless extremely dry weather limits the degradation of the herbicide. Herbicides with rotation restrictions for corn or grain sorghum are an indication of potential seedling damage.

The species and cultivar selected should be adapted to the soils. If several different soils occur in a

field, a mixture should be considered, and changes in seedbed preparation may be required.

Seedbed Preparation

A firm, weed-free seedbed is preferred. Three different types of seedbeds can be used when seeding cropland: standing cover, surface mulch, and clean-tilled. The particular seedbed preparation used will depend on climate, soils, and the intended use.

Standing cover. A standing cover crop is used to reduce weed competition, prepare a firm seedbed, and provide a standing stubble to modify the microclimate at the soil surface. It must be managed to prevent the production of viable crop or weed seed and excessive growth. Excess cover can be removed by mowing, haying, or grazing to leave a 12- to 18-inch stubble.

Grain sorghum has provided the best grass establishment over the years. Grazing of the grain sorghum stubble immediately after the combine normally improves the seedbed quality.

Forage sorghums also produce good grass stands when they have been harvested by haying or grazing and allowed to regrow in late summer. Forage sorghum may be planted in July to allow the plants to be frost-killed before they set seed. Grass is seeded into the standing stubble without additional tillage. Approved herbicides may be used if weed growth begins before seeding.

Use of wheat stubble as a standing cover has been difficult. Snow or heavy rain accompanied by high winds tend to lay the stubble flat, creating a mulch layer that slows soil warming in the spring and is an ideal cover for weed growth. Wheat stubble that is still standing in late March to early April is an acceptable cover.

Surface mulch. A seedbed may be prepared by tillage or chemical destruction of current growing vegetation, such as wheat, to provide a mulch. The growing crop must be completely killed or it will become direct competition with the establishing seedlings. The surface needs to be left free of weeds and with a mulch layer.

Clean-tilled. Clean-tilled seedbeds are usually used where precipitation is greater than 32 inches per year. Two tillage approaches can be used.

- Normal seeding date — the seedbed is tilled as needed to destroy all weeds and leave a firm, friable seedbed. Seeding should be done during the optimum seeding period. Weed control will be a major requirement to a successful stand.

- Mid-June seeding — the seedbed is tilled from March to mid-June maintaining it in a firm, weed-free condition. Seeding is done in mid-June. The use of a cultipacker or similar equipment prior to and/or after seeding can greatly improve the stand of grass, especially during seasons of low rainfall. This approach stores soil moisture but requires precipitation after seeding to ensure a good stand.

Seeding Method

Placement of the seed at the correct depth is important. Most native grass seeds cannot emerge from deeper than 1/2 to 1 inch. Special grass drills have been developed that will handle the fluffy seed of most native grass species and ensure accurate placement. These drills have special mechanisms that deliver the seed at a uniform rate. Planting depth is controlled by double disc openers with depth bands that ensure the correct planting depth. Packer wheels are desirable and necessary to cover the seed well and firm the soil around the seed.

An alternative method that can be used if a grass drill is not available is to use a cultipacker to roll the seedbed, then broadcast the seed immediately and roll again. The cultipacker will “plant” the seed at approximately the correct depth and ensure that a firm covering has been provided. Historically, this has been the least effective seeding method unless timely precipitation occurs.

Origin and Quality of Seed

Best results are obtained by using named cultivars of adapted native species. Contact NRCS for areas and site adaptations for named cultivars.

The law requires knowing seed quality to determine the correct amount of seed to plant. Native grass seed quality is measured on a pure-live-seed (PLS) basis. Germination and purity tests are available from state and private laboratories. To obtain percent PLS, use equation 1. To determine the amount of bulk seed to be planted, divide percent PLS into the seeding rate per acre in PLS pounds (equation 2).

$$\% \text{ PLS} = (\text{germination} \times \text{purity}) \div 100 \quad (1)$$

$$\text{bulk PLS pounds} = \frac{\text{seeding rate in PLS pounds}}{\% \text{ PLS}} \times 100 \quad (2)$$

Some examples. A switchgrass seed lot has a test of 92 percent germination, 5 percent firm or hard seeds, and a purity of 98 percent. The PLS for the seed is 95 percent $[(92 + 5) \times 98 \div 100]$. If the switchgrass seeding rate is 3 PLS pounds per acre, the bulk seed to be planted per acre is 3.16 or 3.2 bulk pounds per acre $(3.0 \div 95 \times 100)$.

A big bluestem seed lot has a germination of 85 percent with no hard seed and a purity of 60 percent with a seeding rate of 6 PLS pounds per acre. The bulk seeding rate would be 11.76 pounds per acre $[6 \div (85 \times 60 \div 100) \times 100]$. The results are in table 1.

Seeding Rates

Seeding rates vary by soil, precipitation, and intended use of the seeding. For help on seedling rates and mixtures, consult the county Natural Resource Conservation Service Office, county Research and Extension agent, wildlife agencies, or seed dealers.

Seeding Dates

Recommended planting dates are based on research and experience. For a warm-season grass, the optimum seeding date is about 2 weeks before the average last frost date and at least 6 weeks prior to hot, dry summer weather (figure 1). The acceptable period for seeding should be from one month before to 3 weeks after the average last frost date. This allows the seedling 6 to 8 weeks to establish the permanent root system before the onset of hot, dry summer weather.

Fertilizing

In the drier climates of Kansas and Nebraska, fertilizer and lime normally are not required nor recommended on native species at seeding time. Lime is suggested if the pH is below 6.0 by soil test. Consult NRCS or county Research and Extension personnel for local needs. Fertilizing will stimulate weed competition.

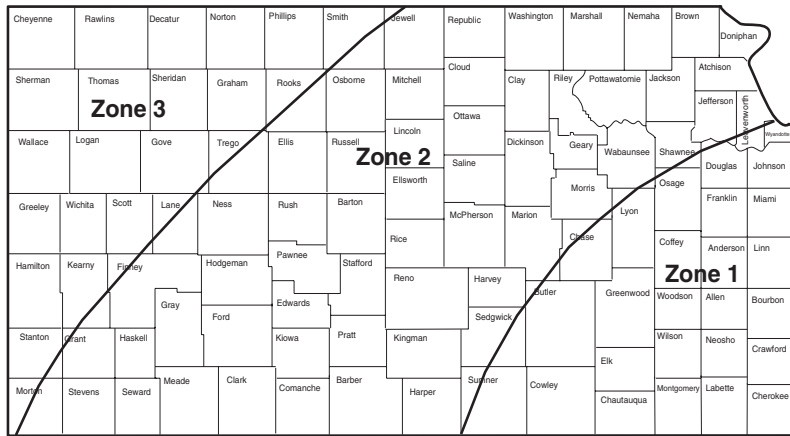
Management During Establishment

The main management consideration during establishment is to control weeds and grazing.

Table 1.

Seed type	Seed analysis			% PLS	Seeding rate (PLS lbs)	Bulk pounds
	Germination	Hard seed	Purity			
Switchgrass	92	5	98	95.1	3.0	3.16
Big bluestem	85	0	60	51.0	6.0	11.76

Figure 1. Optimum and Acceptable Seeding Dates for Native Grass Species



Zone	Optimum	Acceptable
1	March 25–April 10	Feb. 15–May 1
2	April 1–April 20	March 1–May 15
3	April 10–April 30	March 1–May 15

Grazing should be deferred during the first and possibly the second growing season depending on stand establishment. Short periods of grazing (flash grazing) for weed control early in the first growing season are encouraged in most cases. An example would be to graze one day with enough animals to harvest the weeds without damaging the grass seedlings. Grazing stimulates tillering in the grass seedlings. Consult local NRCS or a county Research and Extension agent for further information.

Haying the year of seeding can be beneficial if there is enough forage produced. Cut the hay at a 4-inch height to ensure the plants can readily regrow. As a general rule, hay most native species by mid-July. This will allow time for the plants to develop tiller buds for the following year and to build food reserves for early growth.

Weed Control

Weed control is necessary in new seedings to reduce competition for moisture, nutrients, and sunlight. Low-growing, dense shade like that created by annual grasses is of greatest concern. The annual grasses most commonly encountered are downy brome, Japanese brome, crabgrass, and foxtail. Tall, open stands of annual broadleaf weeds such as sunflower or marestail can aid in grass establishment by providing shade and lowering soil temperatures. When weed control is necessary, grazing, mowing, and herbicides are the main methods. Weed control is most beneficial during May and June with little benefit from August control.

Preplant or pre-emerge herbicides are labeled for some species and situations. These should be used according to label instructions to minimize the weed

control needs. Consult current herbicide recommendations for products, rates, and timing.

Grazing to control weeds should be closely managed to permit the control of weeds without significant use of seeded grasses. Graze weeds when they are small and palatable to the animals.

Mowing, while expensive, can be effective for annual weed control when done at the right time. Mowing must be done before the weedy plants produce seed. Generally, broadleaf weeds should be mowed before they are 8 inches tall. Annual grasses should be mowed to prevent seed production.

Herbicides may be used to reduce annual or perennial broadleafed weeds after the grass plants have become established. Consult the label for application restrictions and instructions.

Chemicals must be federally and state registered and applied in accordance with authorized registered uses, directions, and cautions on the label and all other federal and state policies and requirements.

Management After Establishment

After establishment, seeded areas should be managed to promote tillering and spread of the plants. Increasing basal density and canopy cover will reduce erosion, provide more forage, and improve wildlife habitat.

Grazing new stands must be done with sound management principles and practices. These include proper stocking rates, good grazing distribution, and proper season of use. Good management of a seeded grass stand is a must with the investment of time, money, and labor involved in establishing good grass cover.

Haying should be done in early July to harvest the highest combination of dry matter and nutrient value. A minimum cutting height of 4 inches is recommended to ensure the plants have adequate opportunity for regrowth and building food reserves for the following season.

Prescribed burning should be done in the late spring just as the seeded grasses are starting growth (less than 1½ inches). Burning at this stage stimulates tillering, reduces excess mulch, and increases forage quality. Prescribed burning can be done as early as one growing season after seeding.

Related Publications

- *Managing Kansas Grazinglands for Water Quality* (MF-2086)
- *Range Grasses of Kansas* (C-567)
- *Prescribed Burning: Safety* (L-565)
- *Prescribed Burns: Planning and Conducting* (L-664)
- *Prescribed Burning: A Management Tool* (L-815)
- *Prescribed Burning: Equipment* (L-876)
- *Grazing Distribution* (MF-515)
- *Stocking Rate and Grazing Management* (MF-1118)
- *Managing Conservation Reserve Program Grass Stands* (L-798)

Paul D. Ohlenbusch
Grazingland Management Specialist

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Publications from Kansas State University are available on the World Wide Web at: <http://www.oznet.ksu.edu>

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Paul D. Ohlenbusch, *Establishing Native Grasses*, Kansas State University, October 1997.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2291

October 1997

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Marc A. Johnson, Director.