



Prairie Grass

Prairie grass (*Bromus willdenowii* Kunth.) is a tall-growing perennial grass that is suited to well-drained soils with medium to high fertility levels and a pH of 6.0 or greater. Prairie grass is a type of brome grass, but unlike smooth brome grass it does not have rhizomes and produces seed heads each growth period, especially during the summer. Herbage and immature seed heads of prairie grass are highly palatable.

Prairie grass is more drought resistant than most cool-season forage grasses (Table 1) and continues to grow later in the fall. Fall harvesting improves its winter persistence. Prairie grass persists for 4 to 6 years in Pennsylvania if properly managed and matures about the same time or a little later in spring than orchardgrass. Forage quality compares well with that of other cool-season grasses, but prairie grass is more palatable. It is excellent for providing forage during droughts and for extending the grazing season in Pennsylvania well into the fall.

Prairie grass is occasionally referred to as rescue grass (*Bromus catharticus* Vahl). The two grasses are related, but they are not the same. Rescue grass is less persistent in Pennsylvania's climate.

ADAPTED VARIETIES

'Matua' is the only prairie grass cultivar currently sold in the United States. It was developed in New Zealand under grazing conditions and has been very productive in Pennsylvania. Other prairie grass varieties are being evaluated by the USDA Pasture Research Laboratory and Penn State for persistence and productivity, but none are marketed in Pennsylvania at present.

ESTABLISHMENT

Prairie grass is slower to emerge after seeding than either tall fescue or smooth brome grass. However, prairie grass has greater growth and development after emergence than either of these grasses. A moist, firm seedbed is required for prairie grass or prairie grass-legume mixtures. Spring or summer seeding of prairie grass is recommended in Pennsylvania, but summer seedings should be completed by early August in the northern half of the state and by mid-August in the lower half. Later seedings generally do not become adequately established to survive Pennsylvania winters.

Seed may be either drilled or broadcast, but drilling is preferred because it provides a more uniform depth of

Table 1. Characteristics of perennial cool-season grasses in Pennsylvania.

Grass	Seedling vigor	Tolerance to soil limitations			Winter survival	Tolerance to frequent harvest	Relative maturity ^b
		Droughty	Wet	Low pH ^a			
Kentucky bluegrass	M ^c	L	M	M	H	H	Early
Prairie grass	H	H	L	M	L	M	Early-medium
Orchardgrass	H	M	M	M	M	H	Early-medium
Perennial ryegrass	H	L	M	M	L	H	Early-medium
Reed canarygrass	L	H	H	H	H	H	Medium-late
Smooth brome grass	H	H	M	M	H	L	Medium-late
Tall fescue	H	M	M	H	M	H	Medium-late
Timothy	M	L	L	M	H	L	Late

^a pH below 6.0

^b Maturity characteristic refers to relative time of seed head appearance in spring. This depends not only on species, but also on variety.

^c L = low, M = moderate, H = high

planting. Plant seeds 1/4 inch deep. Although in general the awn has been removed from prairie grass seed sold in the United States, the long fluffy seeds often bridge in conventional seed drills and make planting difficult. One of the following alternate seeding methods can help reduce this problem: (1) mix prairie grass seed with a small amount of triple superphosphate and sow through the fertilizer attachment of the grain drill, or (2) mix prairie grass seed with a small amount of oats and sow through the small grain attachment of your grain drill (spring seeding only).

Most hopper-type fertilizer spreaders can be calibrated to broadcast prairie grass seed. If broadcasting, however, be sure to lightly cover the seed with soil. This can be done by light disking or by following with a drag or harrow. Unlike many other cool-season grasses, prairie grass should not be cultipacked after seeding because this increases the difficulty of seedling emergence and the risk of stand failure.

Seeding rates for prairie grass vary with seedbed condition, method of seeding, and quality of seed. Generally, for seeding prairie grass alone, a rate of 30 to 35 pounds per acre is sufficient. For seeding prairie grass in mixtures with a legume, 20 to 30 pounds per acre is recommended (Table 2). Germination of stored seed can decline rapidly, so seed should be used promptly and not stored from year to year.

Table 2. Seeding rates for prairie grass and a single legume in mixture.

Species	lb/A
Prairie grass	20-30
with any one of these legumes:	
Alfalfa	8-10
Red clover	8-10
White clover	2-4

Weed control during seeding and establishment is extremely important for prairie grass because of its slow emergence and upright growth habit. The latter allows weeds emerging below the prairie grass to receive enough sunlight to continue growing. If weeds have previously been a problem in a field to be seeded to prairie grass, use of a preplant or preemergence herbicide is recommended. Refer to the most recent edition of the *Penn State Agronomy Guide* for efficacy and use restrictions of herbicides labeled for use during and after forage grass establishment.

HARVEST MANAGEMENT

Following spring seeding, prairie grass can be grazed after 50 to 70 days or harvested for hay after 80 to 110 days, depending on climatic conditions. Grazing the initial harvest after spring seeding stimulates the formation and development of new shoots. Although prairie grass roots develop faster than smooth brome-

grass or tall fescue roots, you will need to make sure grazing animals do not pull the young plants out of the ground.

If prairie grass seedlings are harvested for silage or hay, fewer new shoots will develop and the stand will have reduced ground cover and a bunch-type appearance. Prairie grass yield from the first harvest after seeding is similar to that of smooth brome grass, but less than that of tall fescue. Grazing during the fall after a summer seeding is not recommended.

In established prairie grass stands, delaying the first spring harvest reduces the recovery rate and lowers the yield potential of the next cutting. Under normal weather conditions, about 25 to 30 days of regrowth is sufficient between harvests. This period provides a good balance of prairie grass yield and quality. Generally, by this time, new shoots have developed at the base of the plant, and harvesting or grazing will allow more light to reach the shoots and stimulate their growth. A growth period of approximately 50 days in mid-summer allows prairie grass seed heads to mature and drop seed during August. This will thicken the stand the following year.

The ability of prairie grass to grow at cool temperatures makes it ideal for late fall or early spring grazing. Fall yields of nearly 3.5 tons per acre are possible. Prairie grass persists best when managed so that monthly harvests are made during the fall. In addition, spring yield and shoot density increase when multiple harvests are made in fall. Research completed by the USDA Pasture Research Laboratory has shown that harvesting only once in the fall (November) caused 98 percent of the basal shoots (source for growth the following spring) to winter kill. However, when prairie grass was harvested or grazed three times during the fall, only 35 percent of the basal shoots winter killed. Compromise is needed when fall harvesting because late fall grazing slightly reduces prairie grass vigor the following spring and restricts its use as an early spring grazing source.

Prairie grass should not be cut or grazed below a 3-inch stubble, since energy reserves and buds for plant regrowth are contained in this region. Cutting or grazing below this height weakens the plant and delays regrowth. Yields of nearly 7 tons per acre have been achieved for prairie grass harvested for silage.

Prairie grass is ideal for grazing systems because of its potential for early spring and fall growth. Spring growth offers the opportunity for earlier spring grazing, and fall growth can extend the grazing season by as much as two months longer than that of traditional cool-season grass species. In addition, since seed heads are palatable, it is not necessary to mow off seed heads that remain after grazing.

Prairie grass persists better under rotational grazing than continuous grazing management. It does not withstand overgrazing, especially under excessively wet or dry conditions.

The quality of prairie grass is not as strongly af-

ected as other cool-season grasses by time of harvest. Digestible dry matter intake (DDMI) is greater for 'Matua' prairie grass than orchardgrass. When harvested on May 21, 'Matua' had 25 percent greater DDMI than orchardgrass. This difference increased to 35 percent when 'Matua' was harvested one week later. Prairie grass may contain lower levels of trace elements than other grasses. Including a legume in the prairie grass mixture, or providing trace elements to animals consuming primarily prairie grass, will eliminate potential problems.

FERTILITY

Fertility needs at seeding should be determined by soil test. A soil pH between 6.0 and 7.0 is best for prairie grass, but it is adapted to slightly alkaline or acid soils. In the absence of a soil test, assuming a medium-fertility soil, plow down 0-45-135 pound per acre and apply 20-20-20 pound per acre at seeding (banded if possible). If prairie grass is seeded with a legume, reduce or eliminate nitrogen application at seeding.

Prairie grass requires a high level of fertility for maximum production. It also is very responsive to nitrogen fertilization. If prairie grass is planted with alfalfa or another legume, restrict annual nitrogen applications to 40 or 50 pounds per acre to limit nitrogen's effect on reducing nitrogen fixation of the legume. If prairie grass is grown without a legume, apply 100 to 200 pounds of nitrogen per acre in split applications of 50 pounds per acre in early spring when the grass becomes green and 50 pounds per acre after each harvest and in early fall. Adequate nitrogen fertilization is essential for maximizing prairie grass growth during the fall.

SUMMARY

Prairie grass is a deeply rooted grass that grows best in fertile, well-drained soils. It provides early spring growth and excellent fall growth to extend the grazing season. 'Matua,' the only variety of prairie grass currently sold in Pennsylvania, is a good cool-season grass for Pennsylvania conditions. However, proper management is essential for obtaining adequate yields and persistence.



Prepared by Marvin H. Hall, assistant professor of agronomy, and Jerry Jung, adjunct professor of agronomy

Where trade names appear, no discrimination is intended, and no endorsement by Cooperative Extension is implied.

Issued in furtherance of Cooperative Extension Work, Acts of Congress May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture and the Pennsylvania Legislature. L. F. Hood, Director of Cooperative Extension, The Pennsylvania State University.

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. The Pennsylvania State University does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Direct all affirmative action inquiries to the Affirmative Action Office, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801.

5M693ps61