



Forage Facts

Growing Forage Grasses in Maine

Bulletin #2262

Livestock production in Maine, whether dairy, beef or sheep, depends on forage crops. Some forages are grown as hay, some as silage, and others are grazed. To get the most out of the forages on your farm, you need to know which forages are present and how to manage them. This fact sheet describes management and productivity of the five forage grasses commonly grown in Maine: Kentucky bluegrass, timothy, orchardgrass, smooth brome grass and reed canarygrass.

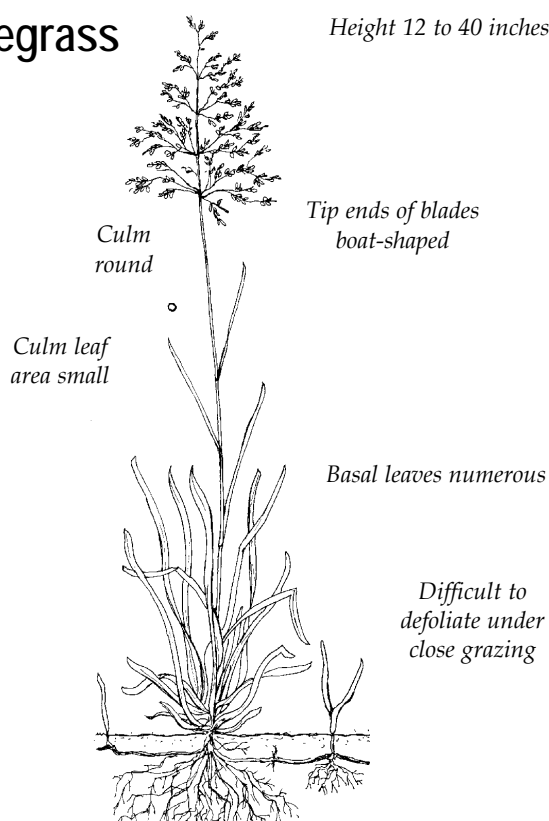
Kentucky Bluegrass

(*Poa pratensis* L.)

Growth Habit and Appearance:

Bluegrass is a short grass (six to 12 inches tall) that forms a dense sod by underground stems called rhizomes. The leaves are quite narrow, and the leaf tips are "boat-shaped." Most of the leaves are near the ground rather than high up the stem. Fine stems are produced mainly in the spring. The seedhead is an open, loose triangle.

Kentucky Bluegrass



To get the most out of the forages on your farm, you need to know *which* forages are present and *how* to manage them.

Adaptation: Kentucky bluegrass (which may also be called Junegrass) is found across New England in both pastures and lawns. In pastures, it rarely needs to be seeded and will tolerate a wide range of soil conditions. High temperatures and low soil moisture during July and August may cause growth to stop completely. Because of its low growth habit, bluegrass dominates pastures that are grazed continuously during the growing season. Bluegrass grows back easily, even with frequent cutting or grazing. This is one reason it is so popular as a turf grass.

Productivity: The yield and palatability of Kentucky bluegrass is good in the spring, but yield is

generally quite low; low enough that it is rarely worth harvesting other than by grazing. Bluegrass flowers in late May to mid-June if it is not cut or grazed, but it will keep producing leaves all summer if it is grazed continuously.

Management Recommendations:

Bluegrass does not respond well to nitrogen (N), phosphorous (P), or lime. Yields will still be low even if you fertilize it. If land or fencing costs are high, improvements on Kentucky bluegrass pastures may not be economical. In pastures where bluegrass dominates, it is usually a result of continuous, season-long grazing.

Timothy

(*Phleum pratense* L.)

Growth Habit and Appearance:

Timothy grows in clumps or bunches. It is generally two to

four feet tall at maturity. Leaves are smooth, flat and have distinct veins. The seedhead is a tight cylinder. This grass reproduces from corms or bulbs at the base of the stem, just below the soil surface. It may be confused with meadow foxtail, a weedy pasture grass.

Adaptation: Timothy is well-adapted to New England and is probably the most popular forage grass in the area, although there are more acres of bluegrass. It grows well in the moderately to imperfectly drained soils common in Maine. However, yield will be low, and the stand will die out faster on either droughty or wet soils. It prefers a soil pH range from 5.6 to nearly 7.0.

Productivity: Timothy is productive under two-cut hay systems or a one-cut system

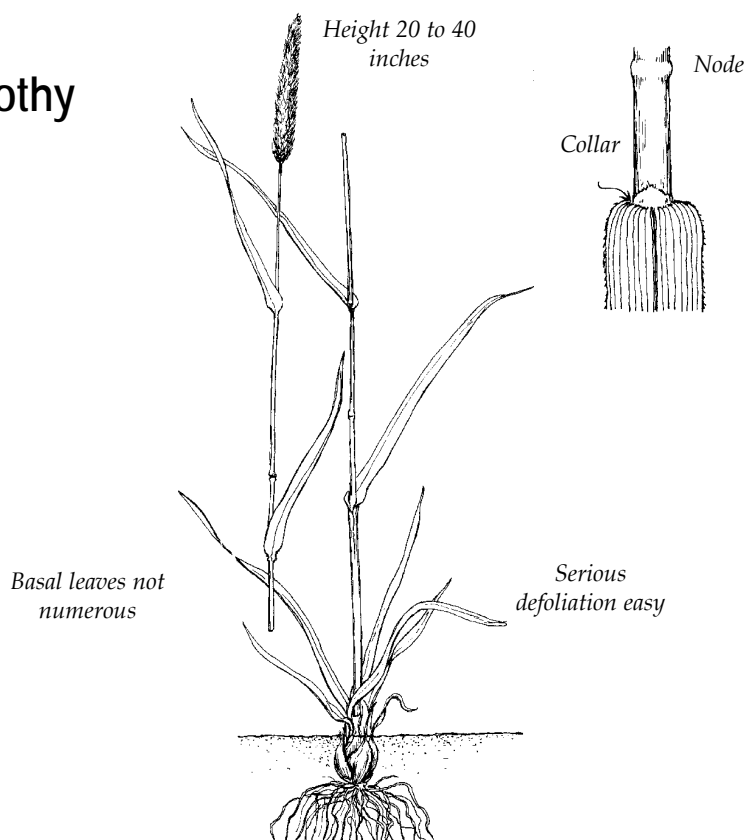
Timothy is well-adapted to New England and is probably the most popular forage grass in the area.

followed by a late summer or fall grazing. It does not survive well under more intensive harvest systems (three or more harvests per year). Hay yield is low and regrowth is slow in dry weather because of a shallow root system, and/or if fertility is poor. Like most cool-season grasses, it responds well to nitrogen, either as fertilizer or manure. Annual yield is moderate (two tons hay/acre) but can be increased if well managed.

Management Recommendations:

Timothy is well-suited for grass-legume mixtures, and is most commonly grown with clovers. In general, mixtures with alfalfa are difficult to manage because alfalfa tolerates more frequent harvests than timothy. In Maine, timothy produces seedheads from mid-June to early July. The quality of the forage is very good in late boot to early head stages, but drops after heading. When harvested early, palatability is good for all classes of livestock. Improved varieties are available depending on the management system. 'Climax' flowers later than common timothy. 'Chazy' is compatible with alfalfa in a mixture. 'Richmond' and 'Toro' flower early but have better regrowth potential.

Timothy



Orchardgrass

(*Dactylis glomerata* L.)

Growth Habit and Appearance:

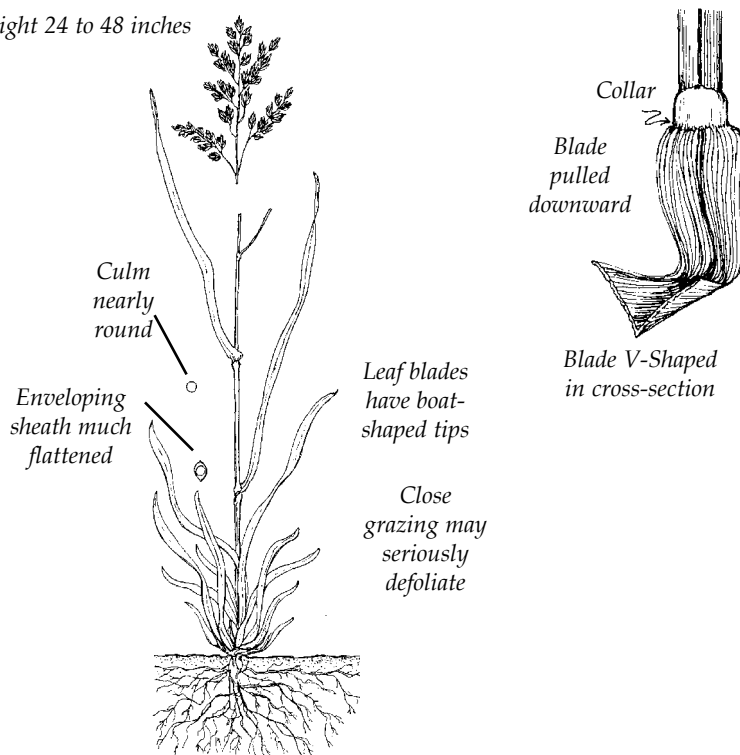
Orchardgrass is a tall, cool-season grass that grows in clumps or bunches. The leaves are folded when young and often form a V-shaped trough. The seedhead is roughly triangular, with seeds produced in bunches. Before flowering, the base of the shoot is very flat.

Adaptation:

Orchardgrass requires well-drained, fertile soils for high yields. It also requires good surface drainage because it doesn't tolerate winter icing. There have been many reports of winterkill in Maine on soils that are poorly or somewhat poorly drained. It is less winterhardy than timothy, so expect stands to be shorter lived. Optimum soil pH range is from 5.8 to 6.8.

Productivity: Orchardgrass is a leafy, fast-growing grass with high yield potential. It flowers earlier than timothy (early to

Height 24 to 48 inches



Orchardgrass

mid-June), but regrowth and summer growth is better. It also responds well to nitrogen fertilizer if pH or other nutrients do not limit growth.

Management Recommendations:

Orchardgrass can be seeded alone

or with a legume. Alfalfa is the preferred legume because both orchardgrass and alfalfa require good drainage, grow upright, are equally competitive when fertility is good, and regrow at a similar rate. Other legumes are not able to compete with orchardgrass. To get high yields, make sure that soil phosphorous (P) and potassium (K) are suitable for both alfalfa and orchardgrass. Soil pH should be 6.2 or higher. If orchardgrass is grown alone, nitrogen should be applied to early spring growth and will probably be needed after each harvest. This grass grows well when harvested for hay or silage, and in a rotational grazing system. Stands will die out if it is grazed continuously.

Orchardgrass flowers in late May to early June. The quality drops quickly after flowering.

Table 1. Rates for seeding grasses alone and in mixtures

Grass species	Seeding rate, 1b/acre	
	Seeded alone	Seeded in mixture
Kentucky Bluegrass*	5-10	5-10
Timothy	8	4-6**
Orchardgrass	10-12	2-3**
Smooth Bromegrass	15	4-6**
Reed Canarygrass	8-10	5***

* Seeding of bluegrass is not usually required.

** Use low rate for seeding with slow-growing legume like birdsfoot trefoil, high rate for seeding with competitive legume like alfalfa.

*** Reed canarygrass is usually grown alone, rather than in mixture with legumes.

Thus, it should be used in hay fields or pastures where early harvest (late boot to early head stage) is possible. Improved varieties like 'Pennlate' and 'Rancho' flower later than common orchardgrass and should definitely be used in new seedings.

Smooth Bromegrass

(*Bromus inermis* Leyss.)

Growth Habit and Appearance:

Smooth bromegrass is a tall, sod-forming perennial grass that spreads by short rhizomes. Leaves typically attach to the stem at a sharp, upright angle and the leaf sheath (the part that wraps around the stem) is closed or continuous. The leaves have a tightened section shaped like the letter "M" about two-thirds of the way to the leaf tip.

Adaptation: This grass is well-adapted to the climate of the northern United States, from Washington to Maine. It is more winterhardy than orchardgrass across this range. Smooth bromegrass will tolerate extremes in temperature and periods of drought, during which it simply stops growing. It is commonly grown as hay or silage with a legume like alfalfa or red clover, where it spreads out as the legume dies. It can also be grown alone if nitrogen fertility is maintained. It is not widely grown in Maine because it requires well-drained, deep soils similar to those required by alfalfa.

Productivity: During spring growth, smooth bromegrass yield is equal to or greater than that of orchardgrass, providing high-quality forage as pasture, hay or

Smooth bromegrass will tolerate extremes in temperature and periods of drought, during which it simply stops growing.

silage. If grown in pure stands, nitrogen fertilizer or manure applications will prevent it from becoming sod-bound. Regrowth after harvest is much slower than orchardgrass or reed canarygrass; this is considered a major disadvantage of smooth bromegrass (see Management Recommendations section). Like other grasses, the quality of smooth bromegrass drops quickly after seedheads are formed.

Management Recommendations:

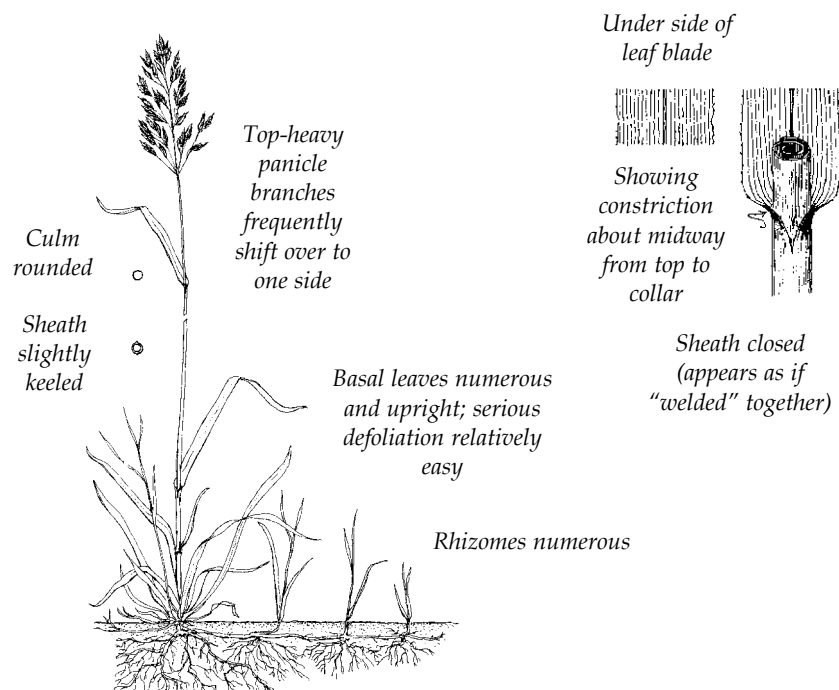
Harvest management of smooth bromegrass is important because of its slow regrowth potential. Harvest, by grazing or machine, removes most of the growing points, and new tillers or stems must be started from buds on the crown.

Before the seedhead is formed, the plant is using carbohydrate reserves ("fuel") for growth; if it is cut during this time, reserves available to start regrowth are low, and there is a greater chance that the plant will not survive. This is especially true for the first harvest of the year. For these reasons, **early harvest or early grazing should be avoided if possible to maintain the stand.**

Like timothy, the variety of smooth bromegrass you choose depends on how you will use this

Smooth Bromegrass

Height 20 to 40 inches



grass. Some varieties, like 'Saratoga,' have been developed for better regrowth. Smooth brome-grass-alfalfa mixtures are widely used, with 'York' smooth brome-grass being well-adapted for this use. However, remember that alfalfa regrows faster than brome-grass, and the grass will do poorly if harvested three or more times per year.

Reed Canarygrass

(*Phalaris arundinacea* L.)

Growth Habit and Appearance:

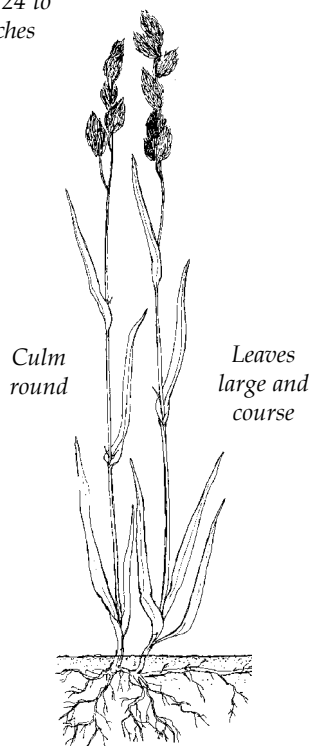
Reed canarygrass is a tall, coarse grass that occurs naturally in wet areas in Maine. It spreads by rhizomes and can form very dense sod. The leaves are wide and flat, and the stem is large and thick when the plant is mature.

Adaptation: Reed canarygrass tolerates a wide range of soil conditions. It will tolerate flooding for several weeks. It is also more drought tolerant than other cool-season grasses. It will tolerate soil pH from 5 to 7, but yield is higher if pH is above 6. It is also an excellent conservation grass because it forms a dense sod; in the past, it has been used mostly for this purpose.

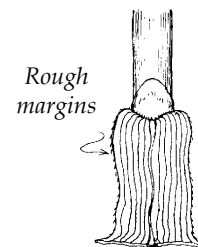
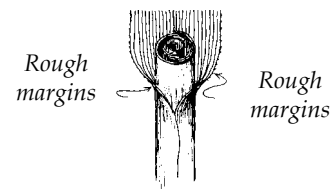
Reed canarygrass tolerates a wide range of soil conditions.

Productivity: Yield of reed canarygrass is among the highest of our perennial forage crops. Although it tolerates poor drainage and fertility, yield is

Height 24 to
72 inches



Leaves
rolled in
bud shoot



Reed Canarygrass

highest when drainage and fertility is good. The high yield potential of this grass also requires frequent application of nitrogen and other nutrients.

Management Recommendations:

Successful management of reed canarygrass for forage production requires some special attention. First, reed canarygrass seedlings must include improved varieties like 'Palaton,' 'Venture,' or 'Rival.' Common reed canarygrass can contain high levels of alkaloids, chemicals that cause livestock health problems and reduce palatability. The improved varieties were developed for reduced alkaloid content.

Second, reed canarygrass seedlings (four to six weeks after seeding) are not very competitive, so competition with weeds or

other forage crops must be kept low. It can be used in mixtures with alfalfa, but the use of companion crops like oats or barley is discouraged.

Third, reed canarygrass flowers very early (early June) and quality drops very rapidly after the seedhead appears. To get high quality forage, this grass must be harvested at or before seedhead emergence. Another reason to use improved varieties is that they flower later than common reed canarygrass, giving you more time in the spring to get onto the field.

Reed canarygrass can be used for hay, silage or under intensive rotational grazing. It will tolerate three or four harvests per year if the season is long enough. Optimum management would include nitrogen applications in early spring (when grass is four

Table 2. Forage grasses at a glance.

	Kentucky Bluegrass	Timothy	Orchardgrass	Smooth Bromegrass	Reed Canarygrass
Drainage	Poor to well drained	Moderate to imperfect; avoid droughty soils	Moderate to imperfect; good surface drainage	Well drained	Poor to well drained
Winterhardiness	Good	Good	Fair, variable	Fair to good	Good
Nitrogen Response	Fair	Fair to good	Good	Good	Good
Cuttings/Year	—	1 to 2	2 to 3	2	2 to 4
Summer Growth	Fair; poor during hot weather	Fair	Good	Variable	Good
Suitability for:					
Continuous Grazing	Good	Fair to poor	Poor	Poor	Poor
Moderate Rotations	Poor	Fair	Fair	Good	Fair to good
Intensive Rotations	Poor	Poor	Good	Fair to poor	Good

to six inches tall) and after each harvest or grazing cycle.

The five grasses listed in this fact sheet are the most commonly used forage grasses in Maine. Under specific situations, several other grasses (like tall fescue or perennial ryegrass) may be used, but their adaptation to Maine conditions is uncertain. When you select grasses for hay or

pasture, your choice is based on many factors, like soil fertility and harvest management. Grass production over a period of years also requires that you pay attention to these factors after seeding these grasses.

For more information on forage crops, contact your county Extension office.

Acknowledgement

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