



Pasture Production with Selected Forage Species

Carl Majewski, Extension Field Specialist, Food & Agriculture

Many species of grasses and legumes serve as forages. However, not all forage species are suited to New Hampshire’s climate and growing season, nor are all species adapted to grazing by animals. To be productive in a pasture system, a plant needs to be able to withstand frequent defoliation, provide regrowth quickly throughout the growing season, and provide sufficient yields of high-quality forage.

Most of the suitable pasture species in New Hampshire can be grouped into cool-season perennials, warm season grasses, and cool season annuals. None of the species listed is any better than the others. Rather, species differ in their ability to perform under certain conditions and management practices. When choosing a forage species for new seedings, consider the conditions of your property and the intended use for the forage stand. Combining two or three species of grasses and legumes adapted to your site provides a variety of forage that’s more likely to fill all the niches in your pastures.

Cool Season Perennials

These species form the backbone of most pastures in the state. As their name implies, they are most productive during the cool, moist weather conditions we have in spring and early fall. Cool season perennials include both grasses and legumes.

Kentucky bluegrass is a sod-forming grass, and its low growth habit enables it to withstand heavy grazing pressure. This makes it ideal for continuous grazing or areas with heavy traffic. However, Kentucky bluegrass goes dormant under dry conditions and makes management during mid-summer a challenge. Also, it yields less dry matter per acre compared to other grass species.

UNH Cooperative Extension Programs

	Community and Economic Development
	Food and Agriculture ✓
	Natural Resources
	Youth and Family



Most pastures in the Northeast are a mix of cool-season grasses and legumes.

“When choosing a forage species for new seedings, consider the conditions of your property and the intended use for the forage stand.”

Orchardgrass is a highly productive bunched grass on sites where it is well adapted. It does best on well- drained soils, and it is tolerant of droughty conditions. Winterkill is occasionally an issue in far northern locations or areas prone to winter ice sheeting. With its upright growth habit, orchardgrass performs best when grazed down to a height of 3-4 inches. It grows rapidly after grazing, allowing you rotate animals back into a paddock in 10-14 days during spring. In fact, its growth is so rapid that keeping up with grass growth can be challenging; most producers harvest surplus grass for supplementing summer pastures or winter feed.

Reed canarygrass is another highly productive grass. It is adapted to a wide range of soil conditions, tolerant of poorly-drained and droughty soils alike. Though it is weak in the seedling stage, it is a vigorous, sod-forming grass once established. Reed canarygrass generally matures one or two weeks after orchardgrass. High concentrations of alkaloids in the forage can limit palatability, but there are now a number of low-alkaloid varieties that avoid this issue. Leaving a stubble of 3-4 inches and providing an adequate rest period helps to ensure persistence of the stand.

Timothy is a bunched grass that is often included in pasture seed mixes. While it is easy to establish and performs well on moderately well-drained soil, it is not an ideal species for pastures. Droughty soils or dry conditions in mid-summer cause it to go dormant for prolonged periods of time. In addition, timothy does not tolerate heavy grazing pressure. To help it persist, allow a rest period of three or four weeks between rotations.

Perennial ryegrass, tall fescue, and meadow fescue are other grasses sometimes used in pastures. Perennial ryegrass offers better forage quality than any other grass species, but many varieties are not winter hardy enough to persist for more than two or three growing seasons. While it is not recommended, some producers have had limited success using short rotations or seeding perennial ryegrass varieties with high winter hardiness ratings. Tall fescue is a hardy, productive grass sometimes used in pastures. Forage quality is low compared to other grasses (mainly due to poor palatability), but it retains its quality after going dormant for the winter. Some producers will save fall growth and use it for early winter grazing—a practice called ‘stockpiling’. However, tall fescue is infected with an endophyte, a fungus that has a symbiotic relationship with the grass. While the endophyte helps the grass survive, it also can cause some health problems in livestock. Use low-endophyte or ‘friendly’ endophyte varieties for new seedings. Meadow fescue has been in use as a forage species for more than 100 years, though it’s receiving more attention these days. While it yields lower than tall fescue, its quality is significantly higher.

White/Ladino clover is an ideal legume for pastures. It can withstand frequent defoliation and close grazing to a height of 1-2 inches. When sown with a tall grass like orchardgrass, however, graze the sward to a height of 2-3 inches to prevent either the grass or clover from crowding out the other. Common, or Dutch white clover is a particularly low-growing variety that yields relatively little forage. Ladino clover is an improved variety that offers higher dry matter yields.

Birdsfoot trefoil is a legume that offers many advantages. It performs well under a range of soil conditions and provides very high quality forage. Unlike most other forage legumes, birdsfoot trefoil doesn't cause animals to bloat, even with the lush growth that occurs in spring. However, it is slow-growing and weak as a seedling and therefore difficult to establish in pastures. Once established, it persists well in pastures. Prostrate 'Empire' varieties will tolerate grazing pressure better than more upright 'European' types.

Warm Season Grasses

While the species mentioned above perform best in cool, moist conditions, they do not produce well in the hot, dry weather of July and August. In an effort to provide forage during this 'summer slump,' some producers rely on grasses that prefer warm weather.

Sudangrass/sorghum hybrids are annual species that can provide high yields of quality forage, especially the brown midrib (BMR) varieties. Planting in early or mid-June will provide feed by mid July. Young sudan/ sorghum hybrid plants contain high concentrations of prussic acid, a compound highly toxic to livestock. To avoid any problems, let the stand grow to a height of at least 36 inches before allowing animals to graze, and do not allow animals to graze after a frost. Strip grazing the stand will minimize wasted feed from animals trampling stalks.

Millet, including Japanese, German, Hungarian, and common millets, is another annual grass. It yields less than sudan/sorghum hybrids, but it is sometimes used to provide emergency forage during droughty conditions. Plant in late June or early July for best results, and graze when the stand is between six and 12 inches tall.

Switchgrass and *big bluestem* are perennial grasses native to the prairies of the Midwest, but some growers use them in the Northeast. Switchgrass tolerates moderately well-drained or poorly drained soils, while big bluestem tolerates droughty conditions. Because they grow slowly, these grasses may take two years to become established. For best winter survival, plant in late May or June.

Cool Season Annuals

These species tolerate the cooler conditions of late fall, early winter, and early spring, and they can extend the grazing season by an additional month or two.

Small grains such as winter rye, winter triticale, spring barley, and oats provide forage during late fall or early spring. Plant in mid-August for grazing by mid-October. Winter rye, wheat, barley, and triticale stay dormant over the winter and provide additional grazing in early spring before perennial grasses start growing. Although cold winter temperatures kill oats (and sometimes less-hardy cultivars of wheat and barley), these grasses will still provide grazing in fall.

Brassicas include turnips, kale, swedes, rape, and tyfon (a hybrid of turnip and cabbage). While all brassicas have edible leaves, turnips and swedes provide feed from their roots as well. They do not survive cold winter conditions, but they thrive under cool fall conditions. Plant from late May to early July for best results. To avoid health problems, introduce livestock to brassicas gradually, and limit their consumption to about 75% of their total dry matter intake. Strip grazing will allow animals to graze while preventing them from trampling and wasting feed.

With proper management, pastures based solely on cool season grasses and legumes can produce satisfactory yields. While warm season grasses and cool season annuals have the potential to improve pasture production during those periods when growth from cool season perennials is slow, growing them may not always be cost-effective. Pastures with stony soils or steep slopes make annual tillage and reseeding impractical. When deciding whether or not to use these species in your pastures, consider your soil conditions and the cost of establishment.

The following table gives recommended seeding rates for pasture forage species.

Species		Seeding rate per acre*	
		Alone	In mixes
Cool season perennials	Kentucky bluegrass	12-15 lb.	8 lb.
	Orchardgrass	10-12 lb.	5 lb.
	Tall fescue	12-15 lb.	8 lb.
	Perennial ryegrass	10-12 lb.	6 lb.
	White/Ladino clover	-	1-2 lb.
	Birdsfoot trefoil	-	6 lb.
Warm season grasses	Sudangrass/sorghum hybrids	65 lb.	-
	Millet (all types)	15-20 lb.	-
	Switchgrass	8-10 lb. PLS	-
	Big bluestem	10-12 lb. PLS**	-
Cool season annuals	Small grains	2 bu.	-
	Brassicas	3-5 lb.	-

Created: December 2012
Reformatted: October 2017

Visit our website:
extension.unh.edu

UNH Cooperative Extension brings information and education into the communities of the Granite State to help make New Hampshire's individuals, businesses, and communities more successful and its natural resources healthy and productive. For 100 years, our specialists have been tailoring contemporary, practical education to regional needs, helping create a well-informed citizenry while strengthening key economic sectors.

The University of New Hampshire Cooperative Extension is an equal opportunity educator and employer. University of New Hampshire, U.S. Department of Agriculture and N.H. counties cooperating.

About the Author

Carl Majewski is a Field Specialist in Cheshire County on the Dairy, Livestock and Forage Crops team. His interests are corn and forage production, with a particular interest in forage quality, pest management, and soil fertility.

For More Information

State Office

Taylor Hall
 59 College Rd.
 Durham, NH 03824
<http://extension.unh.edu>

Education Center and Infoline

answers@unh.edu
 1-877-EXT-GROW
 (1-877-398-4769)
 9 a.m. to 2 p.m. M-F
extension.unh.edu/askunhex-tension