

Timothy

Garry D. Lacefield, Jimmy C. Henning, Timothy D. Phillips, and Monroe Rasnake, Department of Agronomy

Timothy (*Phleum pratense*) is native to the continents of Europe and Asia. The first appearance of timothy in North America has been traced to early settlements in New England. Early agriculturists referred to it as Herd grass after John Herd, who found it around 1711 growing wild along the Piscataqua River near Portsmouth, N.H. Later, Timothy Hanson played a major role in promoting the use of this grass in Maryland around 1720 and in North Carolina and Virginia. The first known use of the name timothy for this grass can be traced to Benjamin Franklin in a correspondence dated July 16, 1747. He planted this grass on a 300-acre farm near Burlington, Vt., and later wrote about the relative superior winter hardiness of timothy compared to red clover.

Timothy is a perennial bunch grass that does not spread by rhizomes or stolons. Timothy has a shallow, fibrous root system. It differs from other grasses in that its lower internodes remain short and become enlarged. This enlarged structure is referred to as a haplocorm, or corm, (Figure 1) and serves as a storage organ for carbohydrate reserves. Timothy is readily identified by its characteristic cylindrical seed head, blue-green color, and swollen tiller base. Individual timothy shoots live during parts of two growing seasons, and some new shoots develop each year from older ones, which results in a perennial stand.

Timothy is primarily used for hay and fits well in mixtures with an adapted legume such as alfalfa or red clover. Timothy hay, either alone or in mixtures with alfalfa, is much desired by horse owners. Over 70% of the total seasonal grass growth has been completed by the time the plant is at boot or a later maturity stage. In subsequent cuts of a timothy-grass mixture, the legume will predominate. In pure stands, the first crop is usually harvested for hay or silage and the following growth is grazed. Timothy grows well in the cool, humid sections of the northeastern United States. Kentucky is considered to be on the southern edge of the timothy production area.

Varieties

“Clair” timothy is a naturalized variety obtained from the farm of Clair Andrew near Vevay, Ind. It was jointly released by the USDA Agricultural Research Service and the University of Kentucky Agricultural Experiment Station in 1958. Clair has been observed to have good aftermath forage production compared to other varieties. Clair matures earlier and is more resistant to foliar diseases when grown in Kentucky. Limited information is available comparing the agronomic characteristics of Clair and



Figure 1.
The stem base of a timothy plant showing the enlarged lower internodes or corm.

more recently released varieties of timothy. Clair continues to produce forage dry matter yields equal or superior to that of newer varieties. In recent variety tests in Virginia, Clair yielded more than the six other timothy varieties included in the study. At another Virginia location, Clair yielded 21% and 24% more than “Timfor” and “Mohawk,” respectively, over a three-year period. Finally, Clair yields were equivalent to those of “Tiller,” Mohawk, and Timfor in the first year of a University of Kentucky study. (For more information on the most recent yield data on timothy, please see the 1993 Kentucky Timothy Variety Test Report, Agronomy Notes, Volume 27, No. 2).

Always plant certified seed of an improved variety of timothy. Tests at the University of Kentucky and elsewhere have found common timothy to nearly always be lower yielding than improved, certified varieties.

Establishment

Timothy can be successfully seeded in late summer/early fall or late winter/early spring. Timothy usually should not be seeded in mixtures with other grasses because of differences in maturity, palatability, and management requirements. Most seedings in Kentucky are made in late summer or early fall. Seedings made later than mid-September have a greater risk of winter injury. Stands seeded late (October) produce less yield

the following spring and may be more prone to erosion, heaving, and winter kill. A light seeding of a small grain (less than 1 bushel per acre) made with the timothy can aid establishment and reduce erosion risk and heaving. The success of the establishment of a timothy or timothy-legume mixture seeded with a small grain companion crop may depend on removal of the small grain before it begins to compete too strongly with the timothy.

Timothy can be seeded either directly into conventionally prepared (tilled) seedbed or drilled no-till into fields whose competing vegetation has been suppressed by herbicides. Prospective fields should be fertilized and limed according to soil test before seeding.

Any no-till drill that plants in 7-inch to 8-inch rows and is set to deliver seed at the proper rate and depth will produce high yielding stands of timothy with only one pass across a field. Cross drilling (drilling a field twice at right angles) may be desirable on highly erodible areas and can give quicker ground cover but will not lead to higher yields.

If seeding in pure stands, apply nitrogen at 50 lb per acre prior to seeding. Then plant at the rate of 4 to 6 lb of seed per acre. When seeding in a mixture with an adapted legume, reduce the rate of timothy seed to 2 to 4 lb per acre. Plant seed ¼ inch to ½ inch deep. In prepared seedbeds, cultipacking or rolling following seeding will firm the soil to ensure good seed-to-soil contact and will help to hasten germination and emergence.

Management

For highest quality hay, timothy should be harvested in spring during late boot to early flowering stage. Beyond this stage, digestibility decreases at the rate of about 0.5% units per day (Table 1). Aftermath growth can be grazed at 4-week to 6-week intervals. Production and cutting frequency are greatly affected by soil moisture, temperature, fertility, and disease.

Timothy is especially sensitive to overgrazing because only a small part of its total leaf area is below the close-grazing height. Continuous close grazing prevents the storage of food reserves, reduces yield, and shortens the life of the plant.

Timothy is a very palatable grass and is usually ranked higher in energy than orchardgrass or tall fescue at comparable maturity stages. Quality (digestibility, protein content, and palat-

ability) decline rapidly as the plant matures. Under good management and soil conditions, timothy yield is comparable to other cool season grasses, although 70% of the yield is usually obtained in the first cutting.

In addition to feed for cattle and sheep, timothy hay is widely used for horses and is a desirable grass as a component of horse pasture.

Nitrogen Management

Pure Stands. For hay, apply 60 to 80 lb of N per acre to pure stands that green up in the spring. Yield responses are possible with N rates up to 100 lb per acre. Late fall applications of N (30 to 40 lb N/A) can stimulate tillering and promote higher seed yield the following spring.

Mixed Stands. In general, nitrogen should not be applied to any timothy-legume that contains at least 25% legumes. Yields of mixed stands with 40% legume will be comparable to timothy plus N. Although stands with less than 40% legume will yield less than timothy plus N, even small amounts of legume can have significant effects on animal performance. In addition, hay and pasture quality will be higher due to the legumes, and the cost per ton of production will be less in timothy-legume stands than when these are fertilized with N.

Seed Production

Historically, timothy has been an important seed crop in Kentucky. However, at present only a small acreage of timothy is grown for seed. Seed yields are variable, but yields of 300 to 500 lb of seed per acre are not uncommon. As with most cool-season grasses, seed yields are increased by application of nitrogen fertilizer. Late fall (November and December) N applications can stimulate tillering and support higher seed yields. Because of timothy's tendency to lodge, timothy seed fields should not receive more than 40 to 50 lb of nitrogen between February 15 and March 15. Earlier applications will result in some leaching of N, and later applications will encourage vegetative growth and lodging, lowering seed yields.

Additional related publications are available from your county Extension office:

- AGR-64 Establishing Forage Crops
- AGR-33 Growing Red Clover in Kentucky
- AGR-26 Renovating Grass Fields
- AGR-62 Quality Hay Production
- AGR-58 Orchardgrass
- AGR-59 Tall Fescue
- AGR-76 Alfalfa-The Queen of Forages
- ID-101 Interpreting Forage Quality Reports
- Agronomy Notes, Vol. 27, No. 2
- Agronomy Notes, Vol. 27, No. 9
- 1993 Kentucky Timothy Variety Test Report
- 1994 Kentucky Timothy Variety Test Report

Table 1. Effect of stage of maturity on timothy hay quality

Stage	Crude Protein, %	Acid Detergent Fiber, %	Neutral Detergent Fiber, %	Total Digestible Nutrients, %	Relative Feed Value
Late Vegetative	17.0	29	55	66	112
Early Bloom	15.0	32	61	61	98
Mid Bloom	9.1	36	67	58	84
Late Bloom	7.8	40	70	54	77

SOURCE: Nutrient Requirements of Dairy Cattle, 6th Edition, 1989. National Research Council.