

Annual Ryegrass

Garry Lacefield, Mike Collins, Jimmy Henning, Tim Phillips, Monroe Rasnake, Robert Spitaleri, Dan Grigson, and Keenan Turner

Annual ryegrass (*Lolium multiflorum* Lam.), also called Italian ryegrass, is a high-quality, cool-season, winter annual bunchgrass that is closely related to perennial ryegrass (*Lolium perenne* L.). Historically, annual ryegrass has not been grown to any significant extent in Kentucky primarily because of the lack of availability of varieties with sufficient winter-hardiness. However, as a result of plant breeding advances, especially improvements in winter-hardiness, varieties are now available that are suitable for use in forage programs in Kentucky.

Dairy farmers utilizing grazing and beef stocker operations have had success with the use of annual ryegrass to these grazing systems. The high forage quality and rapid regrowth of annual ryegrass leads to improved livestock production at a lower cost over stored forage.

Description and Origin

The leaves of annual ryegrass are dark green and shiny with smooth edges and clasping auricles. Plants can grow to more than 3 feet in height as the seed heads mature. Annual ryegrass can be distinguished from perennial ryegrass in several ways. Annual ryegrass has long, clasping auricles and awned seeds, while perennial ryegrass has short, non-clasping auricles and the seeds have no awns. In addition, annual ryegrass seeds are larger (224,000 seeds/pound) than perennial ryegrass seeds (330,000 seeds/pound).

Annual ryegrass is closely related to perennial ryegrass and can be readily crossed with it. The varieties created by crossing annual x perennial ryegrass are called intermediate or “hybridum” ryegrasses and can behave more as short-lived perennials. Annual ryegrass varieties are either diploid or tetraploid (with twice the number of chromosomes). Tetraploid varieties tend to yield more, but they may be less winter-hardy.

Annual ryegrass is native to southern Europe and, in some parts of the world, may be called “Westerwold” ryegrass. This is from a variety or varieties that originated in the Westerwolde area in the Province of Groningen, Netherlands. There is no indication that the Westerwold ryegrass differs botanically from Italian (annual) ryegrass. The first reported annual ryegrass that was cultivated was grown in northern Italy. It was reported in France in 1818, in Switzerland in 1820, and in England in 1831. The actual date ryegrass was imported into America is not known, but we do know it was first introduced in the early Colonial days and quickly became an important forage grass, especially in the South.

Annual Ryegrass at a Glance

Origin:	Europe
Characteristics:	Annual, bunchgrass Shiny, dark green, smooth leaves Grows 2 to 3 feet tall
Uses:	Pasture, hay, silage
Seed:	224,000 seeds per pound
Seeding rate:	20 to 30 lbs/ac
Seeding depth:	¼ to ½ inch
Seeding date:	Mid-August to Oct. 1
Harvest:	Hay/silage—boot to early head
Grazing:	8 to 10 inches tall
Yield:	2 to 6 t/ac

Because of easy establishment, volunteer ryegrass can become a weedy plant in such crops as corn or wheat. Timely clipping of seeded areas and infested field borders and waterways, as well as keeping equipment clean, will help limit future weed problems with annual ryegrass.

Adaptation and Use

Annual ryegrass is widely adapted. Though it is best adapted to fertile, well-drained soils, it can survive and make good growth on wetter soils. Annual ryegrass is a heavy user of water and will not grow well during droughts. It is relatively easy to establish and can be used for grazing, hay, silage, and conservation purposes. Because of its quick regrowth, early spring growth, and extended grazing in late fall/early winter, annual ryegrass has greater overall productivity than most other cool-season grasses during its growing period. This characteristic makes it useful to producers trying to maximize the number of grazing days on their farms.

Fertilization

The first and most important agronomic and economic investment in ryegrass fertility is a soil test. Annual ryegrass will grow over a wide range of soil pH levels but grows best at a pH level of 6.0 to 7.0. Phosphorus and potassium should

be at least in the medium range for optimum yields. Annual ryegrass is highly responsive to nitrogen. Depending on planting date and expected growth during fall and early winter, the appropriate nitrogen rate at establishment is normally 40 to 60 pounds per acre, followed by an additional 50 to 60 pounds in late winter/early spring. When used for grazing, the spring application may be split.

Varieties

Common annual ryegrass was successfully grown in the Gulf Coast region of the United States in the 1940s and 1950s. However, crown rust was often a serious disease problem that reduced forage yields and quality in that region. Plant breeding efforts in Texas, Mississippi, and Florida resulted in the release of crown rust-resistant varieties, the first being "Gulf," which was released by Texas A&M University, followed by "Magnolia," which was released by Mississippi State University. Both varieties have provided moderate resistance to crown rust and are still available today. In recent years, many new varieties have been developed by universities and commercial companies. Improvements in forage yield, disease resistance, distribution of growth, and winter-hardiness have been made, making this species much more feasible to use in the upper South.

Variety performance in Kentucky: The University of Kentucky began an Annual Ryegrass Variety Testing Program in 1999. Tests have been conducted at Lexington, Bowling Green, and Princeton. Since 1999, these trials have clearly shown that plant breeders have done an excellent job in developing annual ryegrass varieties that are adapted to Kentucky with sufficient winter-hardiness for the climatic conditions. Yields have been excellent for leading varieties, ranging from 2.5 to more than 6.0 tons per acre. Current results from ryegrass variety trials are available at county Extension offices as Annual Progress Reports and on the College of Agriculture's Web site. To access forage variety test results, including those for ryegrass, go to <www.ca.uky.edu/agc/pubs/respubs.htm>. Scroll through the research reports until you see Annual and Perennial Ryegrass Progress Report.

Establishment

Annual ryegrass has excellent seedling vigor and usually germinates and emerges faster than other grasses. Seedlings can be made from early August through Oct. 1. Earlier plantings are best for late fall and early winter grazing possibilities. Seeding rate for pure stands is 20 to 30 pounds per acre or 12 to 15 pounds per acre if seeded with a small grain or a legume. Seeding can be made into a prepared seedbed or it can be no-tilled into killed sods, crop residue fields, or dormant Bermuda grass. If planted on a prepared seedbed, broadcasting the seed, followed by cultipacking, is a dependable seeding method. When drill-planted, the seed should be placed at a depth of ¼ to ½ inch. Annual ryegrass is a competitive plant and will require good grazing management and competition control to keep a

legume growing with it. When seeded with legumes, an application of nitrogen should be minimized because it will increase competition. Annual ryegrass should not be seeded into a thick, vigorous stand of a cool-season perennial grass, such as tall fescue, because competition will be excessive for the seedling annual ryegrass plants.

Harvest Management

Annual ryegrass can be harvested for hay or silage, or it can be grazed. For the best compromise between yield and quality, cuttings for hay or silage should be made in the boot to early head stage. Rotational stocking is an efficient grazing method to use for annual ryegrass.

Grazing can begin in fall when plants are 8 to 10 inches tall, and it can be grazed to a height of 2 to 3 inches. Because annual ryegrass grows so rapidly in spring, grazing on some paddocks must begin early (4 to 6 inches) to get into the rotation and to utilize as much of the crop as possible in the highest quality stage. Low stocking rates and delayed grazing in spring can result in plants in ungrazed paddocks getting to the seedhead stage before grazing, resulting in lower quality and overall production. Since annual ryegrass recovers quickly after grazing and is very productive during spring when stocking rates are not high enough to utilize growth, harvesting some paddocks as hay or haylage may be necessary.

Forage Quality

Annual ryegrass is recognized as one of the highest quality cool-season grasses. In a leafy stage, it is high in protein, digestibility, and many vitamins and minerals. It also is quite palatable to grazing animals. Grazing studies in several Southern states have shown excellent animal performance. Average daily gains of 1.8 to 2.2 pounds, gain per steer of 250 to 350 pounds, and gain per acre of 300 to 450 pounds are common, with many studies showing higher values. As with other grasses, forage quality declines with maturity. Dairy cows with adequate milking potential that are receiving most of the nutrients from grazing vegetative annual ryegrass will produce from 35 to more than 45 pounds of milk per day.

Summary

Historically, annual ryegrass was not used to a great extent in Kentucky because available varieties did not have sufficient winter-hardiness. New varieties with improved winter-hardiness are now available and more will be developed in the future. In addition to adequate winter-hardiness, improvements have also been made in pest resistance. Annual ryegrass can be used for hay, silage, grazing, and soil conservation. It fits into many feed production programs when there is a need for a high-producing, high-quality winter annual grass. It is widely adapted in Kentucky, and it has excellent seedling vigor. Keys to success include adequate fertility (especially nitrogen), soil selection, and use of a variety with adequate winter-hardiness and optimum harvest management.