

AGR-134
KENTUCKY-BLUEGRASS AS A FORAGE CROP
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Introduction

Kentucky bluegrass, (*Poa pratensis* L.), is one of four cool season grasses that provide the backbone of forage systems in Kentucky. In order of acreage grown, these grasses are tall fescue, orchard grass, bluegrass and timothy. Together, they are the dominant grass species on about 7 million acres of forage in Kentucky. As with all cool season grasses, Kentucky bluegrass does most of its growing in the spring and fall when the weather is cool and adequate soil moisture is available. During the hot summer months it becomes semi-dormant. By doing so it avoids drought damage, but becomes relatively unproductive. Kentucky bluegrass, unlike these other cool season grasses, spreads by rhizomes. Rhizomes are underground stems that grow from parent plants and form new plants. This characteristic of bluegrass helps it fill in open areas and produce a denser sod, two characteristics that make it especially desirable as a turf grass.

Kentucky bluegrass is also used in other ways. It is a high quality forage grass and is particularly well suited for use by grazing animals. Because of its low growth habit and susceptibility to heat and drought, it does not yield as much as the other cool season grasses. Although it can be harvested for seed, most bluegrass seed is produced outside Kentucky. Bluegrass is also grown for producing sod. Thus, bluegrass has 4 primary uses: forage, turf, seed and sod.

Kentucky bluegrass is well adapted to the mountains and the high phosphate soils of central Kentucky. In southern and western Kentucky, it is marginally adapted and is more difficult to maintain. It is adapted in the northeastern U.S. from Minnesota to Maine.

Varieties

Most named varieties of Kentucky bluegrass have been developed for turf purposes. They are low growing, tolerant to close mowing and grazing and resistant to diseases. Varieties were developed to produce thick sods, withstand traffic and maintain a good green color when managed properly. Kentucky bluegrass grown from seed of Kentucky origin performs better in Kentucky than do other named varieties and seed of foreign origin. This superior agronomic performance is because of its resistance to certain diseases and insects. The Kenblue variety was developed to take advantage of this naturally acquired resistance. Developers collected seed from several fields in central Kentucky that had been in bluegrass from 8 to 15 years. The seed used to establish these fields was known to be of Kentucky origin for several generations. The variety was developed and jointly released in the late 1960s by the University of Kentucky and USDA Agricultural Research Service.

Establishment

Bluegrass is best established in late summer (late August to mid-September) in Kentucky. Although it can be seeded in early spring, more weed control problems may develop at that time. Seeding rates of 10 to 15 lb/acre are recommended if seeding alone or with legumes. However, fields in the better bluegrass producing areas may become established in Kentucky bluegrass by natural re-seeding. In some cases, pastures established in other grasses may be invaded by bluegrass.

A legume such as white clover or bird's-foot trefoil can be planted with bluegrass to improve forage quality, fix nitrogen and extend the grazing season. Bluegrass may also be sown in mixtures with other grasses.

Seedbed preparation for bluegrass is similar to that for other cool season grasses.

*Lime and fertilizer applications should follow recommendations based on soil test results.

*Maintain soil pH at 6.4-7.0. Bluegrass will grow well in more acid soils (5.5 or above), but the legumes need the higher pH.

*Phosphate and potash levels should be medium or higher for good production and a long-lasting stand. On soils testing low in phosphate, it is important to get some phosphate worked into the soil where the roots will be growing.

*Bluegrass seeded in the fall should have 50 lb/A nitrogen applied just before seeding. If it will be seeded following corn tobacco or other crops that were fertilized heavily with nitrogen, or if legumes are being planted along with the bluegrass, omit the nitrogen.

*Check the labels of herbicides used with preceding crop to be sure herbicide carryover will not be a problem.

The seed should be placed $\frac{1}{4}$ to $\frac{1}{2}$ inch deep in a firm, smooth seedbed. The following steps make a good establishment method:

*Use a heavy, corrugated roller to firm the soil

*Then broadcast the seed,

*Go back over it with the roller.

Some seeders do all these operations in one pass over the field.

Management and Utilization

Two of the most important factors in managing an established bluegrass stand are fertilization and weed control. Lime, nitrogen and phosphorus are the most critical fertility needs. These should be monitored by soil testing and making additions as needed. Nitrogen may be supplied by legumes growing along with bluegrass, but when legumes make up less than 25-30% of the stand, up to 50 lb of nitrogen per acre can be applied in late winter (March) and again in late summer (August) to boost production. A 50% increase in yields (as compared to no legumes or nitrogen) can be expected from this treatment. Weed control is best accomplished with good grazing management and mowing. The use of herbicides is normally not practical because legumes and grazing animals are present. Good fertility is also important to maintain a good stand of grass and legumes that leaves little room for weeds.

White clovers (ladino or white dutch) work very well with bluegrass because they match its low growing habit and are also well adapted for grazing. Some white clover is present in most bluegrass pastures in Kentucky. Volunteer (wild) white clover repopulates stands naturally by seed and by stolons and can become abundant when management and moisture conditions are favorable.

Intermediate or "common" white clover and Ladino (large) white clover are often seeded into bluegrass pastures in late winter or early spring. The factors necessary to establish white clover in bluegrass are adequate soil fertility, soil pH between 6.2 and 7.0, good (certified) seed planted at the proper time and control of competition from the grass. Nitrogen fertilizer should not be used when establishing legumes in grass sods.

Bird's-foot trefoil is also well suited for growing with bluegrass. This legume is a perennial, non-bloating,

high quality plant that can be used for hay or grazing. It is best suited to the northern half of the state and higher elevations. Crown and root diseases in southern and western Kentucky make it difficult to maintain a stand. 'Fergus' is the bird's-foot trefoil variety most suited to Kentucky conditions.

Bluegrass-legume mixtures are ideal for grazing by all types of livestock. Bluegrass is most famous for its use as horse pasture because of its association with the thoroughbred horse industry of central Kentucky. When managed property, it will produce good quality hay, but yields will be somewhat lower than the other cool season grasses grown in Kentucky.

For fall "stockpiling" the grass is allowed to accumulate in late summer and fall and then is grazed in late fall or early winter. A thick stand of grass with few legumes is the best choice for stockpiling because grasses retain their quality better than legumes in this situation. Up to 50 lb of nitrogen per acre are applied in August and the livestock removed. forage that accumulates is of high quality and will remain so until grazed In November and December. In tests conducted by the UK College of Agriculture, yields increased by 15 to 20 lb of dry matter per lb of nitrogen applied. This practice reduces the amount of stored feed needed during the winter.

Animal Performance

Kentucky Bluegrass is a high quality and very palatable grass suitable for all classes of livestock. Bluegrass harvested at the same maturity stage has more digestible energy per pound than the other cool-season grasses common in Kentucky. It is also high in protein when grazed close. Crude protein levels between 15 and 20% are common. Even higher levels of crude protein have been recorded on plots harvested at an immature stage.

In Kentucky tests over 5 years, beef steers gained 1.19 and 1.24 lb/day grazing bluegrass-ladino clover and bluegrass-alfalfa, respectively. Average annual liveweight gains for the two systems were 446 and 536 lb/A. Other forages were supplied, but were the same for both systems.

Virginia research compared bluegrass with orchard grass and Ky 31 tall fescue as grazing for steers. Data in the following table shows Ky 31 fescue provided more grazing days per acre, but bluegrass and orchard grass produced higher daily gains per steer. The average daily gains for bluegrass-white clover (1.21 lb) obtained in Virginia were almost identical to those for bluegrass-ladino clover in Kentucky (1.19 lb).

Beef Cattle Performance on Three Grass-Clover Pastures in Virginia*

	Liveweight Gains (lb)		
	Steer days per acre	Daily persteer	Per Acre
Orchard grass-Ladino Clover	257	1.28	329
Ky 31 Fescue**-Ladino Clover	303	1.02	309
Bluegrass-White Clover (Blaser et al. 1969)	258	1.21	312

*10 year averages

**Probably fungus infected

Conclusion

Bluegrass is a high quality grass that is well adapted to the Central Kentucky area. It is a versatile grass which can be used for pasture, seed, sod, turf and hay. Most commercial varieties have been developed for sod and turf purposes, but improved forage varieties are available. Legumes-especially the white clovers-improve feed quality and productivity of bluegrass. Animal performance on bluegrass compares favorably with the other cool season grasses grown in Kentucky. Tall fescue provides a longer grazing period, but has been low in quality. The new varieties of low endophyte fescue are closer to bluegrass in quality.

Additional References

(Available from your County Extension Office)

AGR-19 Liming Acid Soils

AGR-26 Renovating Grass Fields

AGR-50 Lawn Establishment in Kentucky

AGR-52 Selecting the Right Grass for Your Kentucky Lawn

AGR-53 Lawn Fertilization in Kentucky

AGR-64 Establishing Forage Crops

AGR-81 Horse Pasture

AGR-85 Efficient Pasture Systems

AGR-90 Inoculation of Forage Legumes

AGR-103 Fertilization of Cool-Season Grasses

AGR-104 'Fergus' Bird's-foot Trefoil

AGR-116 Fertilizing Forage Legumes