SHOULD LEGUMES BE INCLUDED IN *MY* GRAZING SYSTEM?

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What are legumes?

Legumes are broad leaved plants that produce seed in a pod, usually have a tap root, and generally have bright colored flowers. They include a wide range of plants such as white clover, red clover, alfalfa, crimson clover, arrowleaf clover, peanut, soybean, and kudzu. One reason that we should be interested in many of them is that the foliage is of generally higher nutritive quality for livestock than grasses. The other reason is that they have bacteria in nodules on their roots that fix atmospheric nitrogen for their own use as well as providing some to associated grasses in pastures. Legumes can provide 75 to 150 pounds of N/acre annually in a pasture, an attractive advantage as fertilizer nitrogen prices continue to rise.

Why do legumes improve animal performance on pasture?

Legumes are generally higher in protein, digestible energy, and minerals than grasses. For instance, in one study the digestible energy content of white clover was 80%, crimson clover 70%, as compared to 62% for tall fescue and 54% for bermudagrass. Crude protein content of the clovers was 20% while tall fescue was 13% and bermudagrass 10%. Calcium and magnesium content of the clovers was double that of the grasses. Phosphorus content of the clovers were also higher than the grasses.

Legume impact on beef cattle performance

Even a small amount of legume in the pasture can improve animal performance on a grass pasture. This is illustrated in a beef steer grazing trial in north Alabama where white clover, averaging 24% of the total forage in endophyte-infected tall fescue pasture increased average daily gain 44% over tall fescue alone. In northwest Georgia, beef steers on endophyte-free tall fescue pasture gained 2.3 pounds/day with white clover as compared to 1.9 pounds/day with nitrogen-fertilized grass. In southeastern Alabama, beef cows and calves were grazed on Coastal bermudagrass from late winter to autumn during three years. Calf gain was 1.9 pounds/day on pastures overseeded with crimson and arrowleaf clovers as compared to 1.5 pounds/day with nitrogen fertilization.

What legumes should you plant?

This depends on where you live and what kind of pasture grass you are growing. In bermudagrass or bahiagrass sods, an annual clover such as crimson, arrowleaf, ball, rose, or berseem can be planted.

Crimson clover has excellent seedling vigor and will make more winter growth than any other winter annual legumes but it matures more early than some other winter annuals. It has a lower percentage of seed with hard seed coats than other annual clovers so natural

reseeding is poor. Improved varieties available are Flame and AU Robin with greater winter productivity.

Arrowleaf clover is the latest maturing of any winter annual clover, making it highly productive in pastures. It is not tolerant of soil acidity, requires a soil pH of 6, and does not tolerate poor drainage. Arrowleaf clover has a high percentage of hard seed and commercial seed must be scarified. Natural reseeding is excellent. Seedling growth is slow, generally resulting in little early winter forage. The leaves of this clover contain a small amount of tannin which makes it relatively free of bloat problems in cattle. This formerly popular clover is less planted today because of a major problem with virus diseases and root rots. Even so, many fanners continue to use it. In addition to the widely planted Yuchi variety, the new variety Apache developed in Texas has resistance to bean yellow mosaic virus and seed are now available.

Ball clover is a winter annual clover that is an outstanding natural reseeder in grass sods, is well adapted to poorly drained soils, and tolerates close grazing. It does not have a long productive season but can add a considerable amount of high quality forage to a pasture during spring at low cost. Bloat can be problem with this clover.

Berseem clover is a highly productive annual legume with a long growing season. This clover has less cold tolerance than other annual clovers and only the Big Bee variety is recommended for the Coastal Plain region. It requires a soil pH of 6.5 and good fertility. Berseem will tolerate some flooding. Bloat potential is low.

Red clover can also be used as a winter annual and will continue to grow much of the summer and improve pasture quality. It is easy to establish in grass sods but generally will not reseed. Red clover will tolerate a soil pH of 5.5 but responds well to phosphorus and potassium fertilizer.

Annual lespedeza is an excellent reseeding summer annual legume that can be planted in late winter or early spring to improve summer forage quality in either bermudagrass or tall fescue pastures where soil fertility inputs are low. It will not be successful where nitrogen fertilizer is being applied to the grass in spring. Forage yields of this legume are not high but the excellent quality of the forage makes it a valuable addition to low input pastures. Marion is the recommended variety because of its greater disease resistance.

Alfalfa (grazing-tolerant varieties) can be planted in grass sod but are much better suited to planting alone. Alfalfa is an excellent choice to plant on a small area for creep grazing by calves adjacent to where beef cows are maintained on bermudagrass. The drought tolerance and high quality of alfalfa pasture can increase calf weaning weights in late summer when nutritive quality of bermudagrass is low. White and red clovers are better suited for tall fescue and orchardgrass.

Red clover will make more summer growth than white clover during hot dry weather in summer. It has excellent seedling vigor and is easily established in grass sods during autumn or winter. During winter it can be successfully established by broadcast planting as well as drilling. However, red clover varieties now available do not tolerate close continuous grazing and generally survive only two years in central and northern Georgia pastures. Rotational grazing is recommended for red clover.

White clover planted in pastures is typically a ladino or giant-leaf type such as Regal or Osceola varieties. They are easily established by broadcast or no-till drill seeding in grass sods, high yielding, and tolerate close grazing better than red clover. However, ladino clover varieties generally survive only two and occasionally three years in tall fescue pastures over most of central and northern Georgia. Recommendations have been to plant seed every other year to maintain white clover in a pasture. Two new varieties of white clover developed by Dr. Joe Bouton at the University of Georgia are far superior to any ladino clover varieties now available. They were selected under close continuous grazing in grass pastures and have been tested in pastures over the past six years, most of this period being subjected to long periods of drought.

> The ***Durana*** variety has smaller leaflets and is somewhat lower yielding than ladino varieties but has a heavier bloom and seed crop, much higher stolon density for greater carbohydrate storage, and more leaves close to the ground. As a result, it is extremely tolerant of hard grazing, drought, and competes well with tall fescue and bermudagrass in north and central Georgia. It has survived well in grass pastures for six years while ladino clover disappeared after two years. In south Georgia, indications are that on good soils that Durana will persist in Tifton 85 bermudagrass but not in the tight sod of common bermudagrass.
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> The ***Patriot*** variety is a cross of a virus-resistant ladino type with a Durana type. Patriot is higher yielding than Durana, but has larger leaflets, and more stolons and leaves close to the ground than ladino varieties. Survival in grazed grass pastures has been far superior to ladino varieties but slightly less than Durana under harsh conditions.

Should legumes be included in my grazing system?

The answer to this question is easy for livestock producers in north and central Georgia. Legumes are the cheapest way to improve forage quality and animal performance plus furnishing free nitrogen to your pastures. With the advent of two superior new white clover varieties, there is no excuse for not planting clovers in pastures. The cost is low and the potential benefits high. In the Coastal Plain of south Georgia, legumes can be valuable but are less attractive in many situations, provided nitrogen fertilizer prices do not continue to escalate. If the new white clover varieties succeed on better soils in this region, they will be a valuable asset. Winter annual clovers can be useful in many cases but the short growing season of these legumes limit their potential unless they naturally reseed.