WHY GROW CLOVERS?

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Clovers have long been viewed as being special and beneficial pasture plants, but recently the incentives livestock producers have to grow them have further increased. Why are many people more interested than ever in growing clovers in pastures as companion species with grasses? Here are several reasons that collectively make a compelling case.

Lower Nitrogen Fertilizer Costs

Increased cost of nitrogen fertilizer in recent years is probably the number one factor that has resulted in more interest in clovers. Like most legumes, clovers have the ability to obtain nitrogen from the atmosphere and “fix” it in nodules on the roots in cooperation with a special type of bacteria. This plant/bacteria relationship is truly unique. In addition to the nitrogen that is fixed being available to the clover, some of it ultimately becomes available to grass plants growing in association with the clover.

The amount of nitrogen fixed varies depending on species, stand density, fertility, weather, and the extent to which the clover has been defoliated. However, numerous studies have shown that nitrogen fixation/acre/year by a stand of annual clover(s), white clover, and red clover often is within the range of 60 to 150, 100 to 150, and 150 to 200, respectively. The cost of nitrogen fertilizer has varied considerably during recent years, but (as an example) if nitrogen costs $0.55 per pound, fixation of even 100 pounds per acre per year obviously represents a value of $55 per acre per year.

Better Forage Quality

The forage quality of legumes, including clovers, is generally higher than that of most forage grasses. Legumes are usually higher in crude protein, digestibility, and many minerals and vitamins. They also are digested more rapidly than grasses and tend to stimulate increased intake. The result is better performance of grazing animals in terms of higher gains and higher reproductive rates.
Better Distribution of Forage Growth

The introduction of clovers into grass pastures often extends the grazing season as compared to grass alone. Red clover is especially likely to provide additional summer production when grown with cool season perennial grasses. Overseeding a cool season annual legume on a warm season perennial grass pasture such as bermudagrass or on a warm season annual grass pasture such as crabgrass permits production of quality feed during winter and early spring when such pastures would otherwise be unproductive. Also, several species of clovers can extend the grazing season when planted on a prepared seedbed with annual grasses.

Increased Forage Yield

The total yield of forage per acre from a grass/legume mixture is usually increased over that provided by grass alone. For example, in studies conducted over many years in Kentucky, red clover grown with tall fescue produced more total yield than tall fescue fertilized with 180 pounds of nitrogen per acre. A clover/grass mixture is especially likely to increase dry matter yield as compared to grass alone that receives little or no nitrogen fertilizer.

Reduced Risk

Legumes complement grasses in many ways, and having a mixed sward of grass and clovers constitutes a lower risk situation than having a pure grass sward. For example, many pests attack only certain plant species, and therefore a disease or insect pest is less likely to devastate a mixed forage stand than a pure stand of a single forage species.

Benefits in Crop Rotation Systems

In addition to furnishing nitrogen for succeeding crops, clovers tend to improve soil characteristics by enhancing soil tilth. They also may create root channels that benefit subsequent crops grown in rotation with clovers or clover/grass mixtures.

Reduction of Animal Disorders

Clovers can play an important role in offsetting various livestock disorders caused by forage grasses. In a recent survey in southern states, “growing legumes with tall fescue” was found to be the number one strategy used by beef cow-calf producers to increase performance of animals suffering from fescue toxicity as a result of grazing toxic-endophyte tall fescue. Furthermore, the likelihood of grass tetany is reduced by the presence of clovers in animals’ diets.
because the underlying cause of this disorder is magnesium deficiency in animals, and clovers contain higher levels of magnesium than grasses.

**Environmental Acceptability**

Because of their symbiotic relationship with nitrogen-fixing bacteria, clovers and other legumes provide homegrown slow-release nitrogen, which is more environmentally friendly than commercial nitrogen. They furnish pollen and nectar for honeybees, and tend to increase populations of beneficial predatory insects. Clovers also provide food for wildlife including deer, rabbits, and game birds.

**More Interesting and Attractive Pastures**

Clovers are more colorful and attractive than grasses, especially when blooming. They make pastures more attractive to humans and, given their palatability, to grazing animals as well.

**Increased Profit Potential**

The use of clovers can have an enormous positive impact on the economics of raising grazing animals. Nutrition is generally recognized as the primary limiting factor on most livestock farms, and legumes usually provide higher nutrition levels than grasses. Better nutrition means more milk production, higher weaning weights, and increased likelihood of high reproductive efficiency. These factors obviously have a favorable impact on gross income.

Clovers also help reduce or eliminate the requirement to apply nitrogen fertilizer, which typically accounts for 20 to 40% of the cost of producing forage from grasses. Clover seed usually costs $15 to $25 per acre. Other costs associated with establishing clovers depend on the site, situation, and method of seeding, but are typically less than the seed costs. Often the value of nitrogen fixed by clovers during the first year will alone more than offset the cost of clover establishment.

Dramatic evidence of the economic importance of use of clovers and other legumes was provided by a recent review of the results of stocker cattle grazing experiments in Alabama. In the interest of providing a way to get a clearer view of the performance of stocker cattle on forages, performance criteria for stocker steers grazing 37 different pasture treatments used in Auburn University stocker cattle grazing studies were summarized from various research reports and articles. Subsequently, Auburn University 2008 budget estimates for the various forage species or species mixtures involved in these studies were used to determine both the approximate pasture costs/acre and the pasture costs/lb of gain.
The results were striking! Even though only 15 of the 37 pasture treatments involved legumes, the seven lowest total pasture costs/lb of gain, and eight of the ten lowest total pasture costs/lb of gain involved legumes. The reasons why the calculated pasture costs/pound of gain were generally low were some combination of the following: (1) lower nitrogen fertilizer costs; (2) better animal performance; and (3) a longer grazing season.

Conclusion

The use of clovers in forage programs has numerous potential economically important benefits. When clovers are present, animal performance typically goes up while expenses go down. Clovers are truly sustainable plants. Research results, farmer experience and many demonstrations have clearly shown clovers to be agronomically sound, environmentally friendly, and economically advantageous when the following criteria have been met.

**Match The Clover To The Situation-** There may be more than one clover species adapted to be grown in a given field or situation (with white clover and red clover being by far the most widely suitable in Kentucky), but distribution of growth, heading date, tolerance to a particular defoliation regime, reseeding ability, or other factors may make one clover species a much better choice than others.

**Selection Of A Good Variety-** Variety trials have repeatedly shown that some varieties are better choices than others. Some varieties may be superior to others in terms of forage yield, distribution of growth, winter-hardiness, forage quality, or any of several other important characteristics.

**Use Of High Quality Seed-** Use of high quality seed is a key to successful establishment of any crop, including clovers. Use of high quality seed does not ensure success, but use of poor quality seed often ensures failure. Assurance that the germination level is high, that seed is of the species and variety it is supposed to be, that there are low levels of other crop seed present, that there are no noxious weed seed present, and that there are not high levels of inert matter mixed with the seed are among the characteristics that should be provided on seed tags.

**Plant In A Suitable Area-** Because clovers have soil and climatic requirements that differ from grasses and even other clovers, it is essential to plant them in areas where such requirements will be met. It usually is necessary to amend the soil with lime and fertilizer to provide a good growth environment. Soil testing is the only way to know how much lime and fertilizer may need to be applied.
Use An Appropriate Planting Technique- Attention to detail during planting is critically important. Following recommendations for a given clover regarding factors such as seedbed preparation, planting date, seeding rate and depth, and control of competing species helps ensure establishment success.

Proper Management- Once a stand has been established, management in accordance with the needs of the particular clover to be grown is required to reap the potential benefits it can provide. In mixed stands with grasses, management should favor the clover.

Selected References


Potash & Phosphate Institute and Foundation for Agronomic Research. Norcross, Georgia.
