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PRINCIPLES OF FORAGE LEGUME MANAGEMENT

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DO WE NEED FORAGE LEGUMES?

We in the United States are a very energy dependent society. We rely on energy to heat and cool our homes, move raw and manufactured commodities across the country and for countless other things. As demand for energy has increased and a greater portion of our oil is imported, prices for gas, diesel, electricity, and other forms of energy continue to escalate. Many people are unaware that leaves of plants are a means of capturing free energy from the sun if adequate moisture and plant nutrients are available. Through the use of forages, livestock producers have the opportunity to transform free renewable natural resources of solar energy and moisture into meat, milk, wool, and other animal products. Only producers that can make efficient use of these free natural resources will be profitable.

Legumes, with the help of *Rhizobium* bacteria, have the additional attribute of being able to remove nitrogen gas from the air and transform it into a form of nitrogen that plants can use. Nitrogen is the most limiting nutrient for plant growth and the most expensive of the three major nutrients. The energy source for manufacturing commercial nitrogen fertilizer is natural gas. Approximately 16 mcf of natural gas are required to produce one ton of ammonium nitrate (34-0-0). In the last several years natural gas has been selling for \$2/mcf. During this time, the cost of a pound of nitrogen fertilizer spread on a producer's pasture was about 30¢. Along with the increase in fuel prices at the gas pump in 2000, natural gas prices have doubled to \$4/mcf. As nitrogen fertilizer companies renew their contracts for natural gas at the higher price, a pound of nitrogen fertilizer is expected to increase from 30 to 40¢ by spring 2001. As the demand for energy continues to increase, we can expect the price of all forms of energy to rise. This will make legumes an even more important component of profitable pasture and farming systems.

Forage legumes provide other benefits besides adding nitrogen to the soil. They have higher nutritive value than grasses because they are more digestible and higher in protein, calcium, phosphorus, and magnesium. Therefore livestock performance is greater on pastures containing forage legumes. When overseeded on warm-season perennial grasses, cool-season legumes extend the grazing season and thereby reduce cost and labor associated with winter feeding. Cool-season legumes, as well as cool-season grasses, provide some spring weed control through plant competition that can reduce the need for herbicides or mowing. Legumes are more environmentally friendly than grasses because they do not require commercial nitrogen fertilizer that can leach into ground water. In addition to pastures, forage legumes are also used as winter cover crops in rotation with row crops, in organic farming systems, for aesthetics, and for food and habitat for wildlife.

There are likewise factors that restrict the expanded use of forage legumes. A higher level of management is needed to grow a legume-grass mixture than a grass plus nitrogen fertilizer system. Some producers may not have the interest or time to properly manage a legume-grass pasture system. Because most perennial legumes do not survive the hot and dry summers annual legumes must be used in the eastern half of Texas. Perennial legumes such as white and red clover usually act as annuals. Therefore annual planting is necessary each autumn or a clover species with a high percentage of hard seed must be managed for reseeding. Alfalfa is a perennial legume that has been grown successfully on some soil types. But a high level of management is necessary. Legumes are more soil specific than grasses such as annual ryegrass, bermudagrass, and tall fescue. Seldom is a single species the best adapted legume of all soil types on a single farm or ranch. A producer must be familiar with the soils on his or her property and know which legumes species are best adapted.

Forage legumes have many attributes that can enhance livestock production and profitability. As nitrogen fertilizer and other input costs continue to rise, forage legumes will become part of many livestock enterprises. The first step to growing a forage legume successfully is to learn where they are adapted, how they grow, and what their strengths and weaknesses are.