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Legume Evaluations for East Texas, 1979

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LEGUME EVALUATIONS FOR EAST TEXAS

1978-1979 PROGRESS REPORT

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The use of and need for legumes in a pasture system aroused only minor interest in the past primarily because of the availability and price of commercial fertilizers. However, with the tremendous increase in cost of fossil fuels in the early 1970's, monospecie grass pastures in East Texas have become too expensive to meet the maintenance costs of the cattle industry. Legumes, with their unique abilities to serve as host plants for Rhizobium bacteria, which in turn allow atmospheric nitrogen to be used for plant growth processes, offer an excellent opportunity to reduce the cost of dry matter and nutrient production for livestock. In addition to nitrogen-fixation, legumes are among a few select crops that, under proper management, allow cattle to be grazed and slaughtered immediately off pasture. Biologically, forage-fed beef is competitive with grain-fed beef. Costs of production, however, are severely curtailing the present widescale use of these types of carcasses. The efficient management and utilization of productive varieties of legumes will be primarily responsible for the success or failure of a profitable beef and dairy operation in East Texas.

Before legumes can reach their maximum potential as forage crops, however, they must be screened to select the proper cultivars or varieties along with the proper management practices that are conducive to efficient production. The following research conducted by personnel of the Texas Agricultural Experiment Station was partially funded by the East Texas Chamber of Commerce. The studies reported herein were conducted during the 1978-79 growing season.

The first two studies illustrate the degree of statistical handling of large quantities of scoring and rating data. The significance of these two studies is that numerous Plant Introductions have been evaluated and eliminated as having any agronomic potential as forage crops for East Texas. The variety trial presented by Dr. Emerson Shipe, legume breeder, shows the comparative yield rankings of those varieties tested. Although the absolute dry matter production was reduced by inclimate growing conditions, relative

comparisons are valid. The seeding rate and inoculum study with arrowleaf and subterranean clover vividly illustrated the inferior germination and seedling vigor qualities of arrowleaf. Arrowleaf failed 100% in this trial. And, although subterranean germinated late, the forage production at first harvest and subsequent reseeding qualities shows that subterranean clovers may have reviewed potential in this environment. The two greenhouse studies involving rate of sulfur and soil type showed the influence of sulfur on various clover varieties. Some of the more obvious conclusions that may be drawn from this trial are that the soil type may be more important than the fertility rate with regard to establishment; arrowleaf was less productive and subterranean was the most productive on sandy soils; a larger percentage increase in yield due to sulfur rate occurred on sandy soils as compared to loamy soils.

Some of the studies that have been planned for the 1979-80 growing season are:

1. Variety clipping trials on both upland and bottomland soils. Each trial includes about 20 entries.
2. Sod-seeded trial with subterranean clover; planted with and without ryegrass; various seeding rates; nitrogen rates; reseeding potential; subsequent bermudagrass growth.
3. Similar trial as above with arrowleaf clover.
4. Clipping-management study with subterranean clover.
5. Continued evaluation of initial seeding rate on subsequent natural reseeding rate.
6. Nodulation of subterranean clover.
7. Isolation of rhizobia from superior types of arrowleaf clover.
8. Mob grazing of several varieties and species of clovers.
9. Animal performance from subterranean vs arrowleaf clover.