Cattle Business in Mississippi – June/ July 2007
"Beef Production Strategies" article

Forage Technology Adoption

Jane Parish, MSU Extension Beef Cattle Specialist

The on-farm impacts of forage technologies have only been partially realized in the U.S. beef cattle industry to date. Forage-based ruminant livestock production is a significant and integral part of animal agriculture, particularly in the Southeastern U.S. There are approximately 60 million acres of pasture in the Southeastern U.S., accounting for 75 percent of the total U.S. humid pastureland. Southeastern U.S. grasslands are primarily used for beef cow-calf production, while stockering weaned beef calves is another important enterprise on these grasslands. In Mississippi alone, the total value of production of cattle and calves in Mississippi exceeded $216 million in 2006, ranking sixth among the state's agricultural commodities. Total cattle inventory in Mississippi on January 1, 2007 was 980,000 head including 518,000 head of beef cows and 99,000 head of beef cow replacements representing approximately 21,000 operations with stocker cattle production also being very prominent. Other livestock species rely heavily on forage-based nutrition as well. Therefore, the contribution of forage systems to animal agriculture is very significant to Mississippi's economy.

Ruminant livestock, such as cattle and sheep, are useful in converting vast renewable resources from pasture into food and other products for human consumption. Land that is too poor or erodible for cultivation can become productive when utilized for ruminant grazing. One of the best ways to improve agricultural sustainability is by enhancing the yields and characteristics of forages used in livestock grazing. The value of forages combined with the economic value of grazing livestock rival values for the most important field crops given that ruminants obtain 60 to 100 percent of their feed nutrients from forages. The increasing commercial availability of new and proven forage technologies provides beef cattle producers with tremendous opportunities to improve operational profitability through effective use of appropriate forage technologies.

Current status of forage technology adoption in the U.S.
Case study – Non-toxic endophyte-infected tall fescue
According to company estimates, 121,000 hectares of MaxQ^{TM} (non-toxic endophyte-infected) tall fescue have been planted in the U.S. since commercial sales first began in 2000. MaxQ^{TM} tall fescue planting is reported in at least 35 of the 50 states in the U.S. Approximately 70% of MaxQ^{TM} tall fescue establishment has occurred in the last three years. In the initial years of MaxQ^{TM} tall fescue marketing, 155 on-farm demonstrations were set up in 26 states. A company representative for the U.S. marketer of MaxQ^{TM} tall fescue stressed that these demonstration sites went a long way towards educating agricultural producers and local Extension personnel about the MaxQ^{TM} tall fescue product and its inherent technology. Additionally, numerous research trials in multiple states utilized MaxQ^{TM} tall fescue as a forage treatment.

Based on the tall fescue acreage that currently exists in the U.S., the potential for non-toxic endophyte-infected tall fescue products is immense, particularly given that most of the existing tall fescue is infected with the toxic wild-type endophyte. Furthermore, the clear negative impacts of fescue toxicosis on the grazing livestock industries (losses to the U.S. beef cattle industry alone are estimated to be around $1 billion) and significant advantages in animal production gained from using the novel endophyte technology would appear to provide strong motivating factors in the uptake of this technology. However, 6 years after the introduction of the first novel endophyte tall fescue to the U.S. market, less than 1% of the total tall fescue acres in the Southeastern U.S. have been renovated using this product. It is fair to say that this seemingly slow uptake could be somewhat governed by seed supply shortfalls as production capacity is scaled up and the fact that marketing and Extension campaigns often need time to make an impact. However, it is also fair to say that the early impact is ultimately being determined by what appears to be a relatively slow adoption rate, at least when compared to other proprietary forage seed markets. For example, New Zealand has a 5 to 10% annual pasture renovation rate and proprietary products (improved forages) have a 90% market share there.

Several trends in livestock production and acreage usage in the U.S. are potentially impacting non-toxic tall fescue endophyte and other forage technology adoption. Summary reports compiled by USDA show that the number of beef cattle operations is steadily declining in favor of larger operational units. Many of the current livestock producers are approaching or have long since passed traditional retirement age. Pasture lease rates and land values are on the rise with competition from urban development in many areas. In addition, farm production expenditures are increasing with feed purchases accounting for a very large proportion of these expenditures on livestock operations according to USDA figures. According to Twig Marston, Kansas State University, on commercial cow-calf operations in the U.S., “Nutrition has long been singled out as the largest expense for cow-calf producers. Feed costs typically represent 65% to 72% of the annual cow budget. Balancing favorable cowherd performance with low nutritional costs could be the greatest challenge this segment of the industry faces.”

A recent survey of more than 200 industry specialist and producers identifying management priorities in the commercial cow-calf business in the U.S. ranked pasture and range management as the second priority out of 15 management categories with harvested forages and supplemental feeds ranking tenth in the same survey. Respondents emphasized grazing as the preferred route for providing adequate nutrition to the cowherd. In the current political climate of tax credits for ethanol production from corn driving demand for corn, feed inputs in livestock production are becoming increasingly expensive relative to forage alternatives. There are several potential implications on livestock production of “high corn prices” in the short-term including depressed cattle prices for all classes of cattle, elevated feedlot cost of gain, market signals driving placement of heavy-weight cattle instead of calf feds, and profit-minded producers seeking lower cost of gains available on forage-based systems.

As the cost of purchased commodity by-product and co-product feeds rises relative to the cost of forage alternatives, livestock production systems effectively utilizing forage technologies are poised to be highly competitive. Stocker operations will likely be an attractive alternative to add weight to calves on forage systems prior to finishing in the next few years. Additionally, growing environmental and animal welfare considerations in the U.S. could contribute to a shifting focus to more forage-based livestock production systems. The collective sum of these social, political, and economic conditions has the potential to drive profit-minded livestock producers to give more consideration to the adoption of forage technologies.

In the future, economic pressures may become a significant driver of technology adoption in forage-based agriculture. The costs of inputs in agricultural production, including those used in forage-based systems, have risen at a greater rate then the commodities being produced. Ultimately, this erosion of farm profitability must be addressed by improving production efficiencies through the adoption of new technologies. The initial, and probably greatest, improvements in efficiency will need to come in the form of changes in management practices, particularly forage management practices.

Grazing management must be appropriate for many forage technologies to succeed in practice. The climate in the Southeastern U.S., with typically mild winters and high precipitation levels, in combination with well-adapted perennial forage grass and legume species, means that annual forage dry matter yields in excess of 10,000 pounds per acre can be easily achieved with moderate fertilizer inputs. However, the widespread use of continuous grazing indicates that this forage production is currently underutilized. Under continuous grazing, forage utilization is likely somewhere between 20% and 50% under most conditions. This low forage utilization rate with continuous grazing management generally diminishes, or even completely eliminates, the return on any new forage technology. If improvements in grazing management are made that significantly improve forage utilization, then the adoption of technologies, such as non-toxic endophyte-infected tall fescue, will result in greater returns from these investments.

Based on current pasture acreage in Mississippi, the potential for forage technology adoption here at home is immense. Solid research backing, success with leading producers that influence other producers, educational partnerships, and strong product advertising are factors favoring forage technology adoption. Factors slowing this technology adoption include key markets lacking adequate marketing and technical support, lack of producer awareness and inaccurate perceptions about the technology, and acreage moving out of pasture and into alternative enterprises including urban development. Take the time to visit with Extension personnel to learn whether or not a given forage technology is backed with objective research findings, and discover the practical applications of research on specific forage technologies. Also consider visiting with producers who have used these technologies to gain knowledge from their experiences. For more information on beef cattle production, contact your local Extension office.