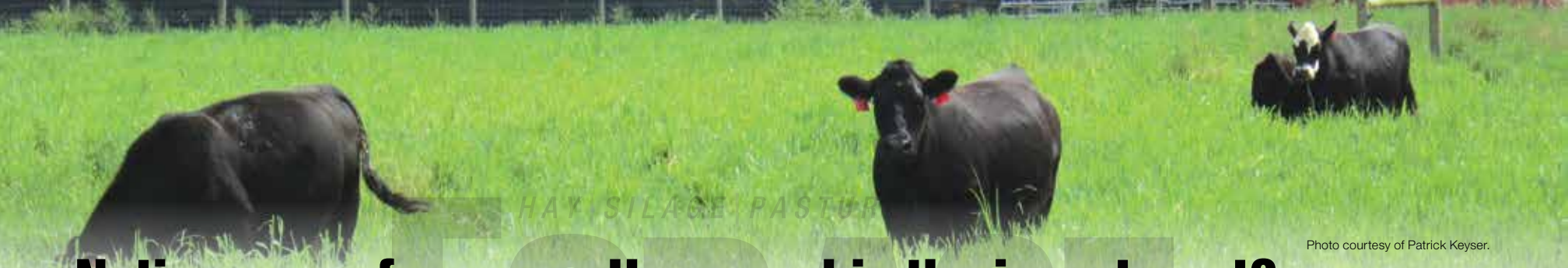

Photo courtesy of Patrick Keyser.

Native grass forages – How good is the investment?

Patrick Keyser and Chris Boyer for *Progressive Forage Grower*

Native grasses are a forage option receiving increased attention in recent years. They provide high yields of high-quality forage with few inputs and show remarkable drought tolerance, making these perennial summer grasses of interest to forage growers. But what about the "bottom line?" How do they stack up when you look at the dollars and cents side of things?

Below, we offer some insight into that question based on some recent analyses using data from two three-year grazing trials conducted at the University of Tennessee.

There are several major factors that influence the economics of any forage grass, including natives: establishment costs (normally pro-rated over 10 years), annual production costs and yield (tons of hay per acre or pounds of beef produced per acre). Economists also include other variables in their analyses, such as depreciation on equipment, land rental and cost of capital (interest rate) – none of which vary with the forage species being considered – and labor.

In the case of natives, establishment costs can be high and are influenced strongly by seed prices. Production costs of natives tend to be lower than for many other forages though, due largely to the modest amount of fertilizer required. For instance, for natives, we calculated budgets based on annual fertilization of 60-30-30 (N-P-K), but for bermudagrass, we used 240-60-80. In terms of yield, the combination of high average daily gains (1.54 to 2.43 pounds per day for 600-pound steers in the study mentioned above) and relatively high stocking (106 to 195 animal unit days per acre in that same study) resulted in total gains of beef per acre of 315 to 454 pounds for native grasses. While other factors contribute, these are the most influential in determining economic outcomes.

Using a constant set of assumptions regarding production, January 2011 prices and University of Tennessee enterprise budgets, we compared costs of production for native grass (a big bluestem and indiangrass blend), summer annual (Sudex) and bermudagrass pastures. Based on assumed yields (initial results in our trials in the case of the natives and from published literature for the other two options) of 299, 334 and 494 pounds of total beef per acre for the native, annual and bermudagrass, respectively, we calculated the cost of gain at $0.31, $0.75 and $0.54 per pound for these same three forages. Keep in mind, this analysis simply spreads per-acre annualized production costs out over the total gain. So, as mentioned above, the results really are heavily influenced by key cost components (establishment and fertilizer costs) and yield.

Using the same budget assumptions and assuming hay yields (based on published literature and University of Tennessee variety trial information) of 4, 3.5 and 6 tons per acre for natives, Sudex, and bermudagrass, respectively, we calculated the break-even price of hay production. The results were $53, $83 and $75 per ton of hay produced for these same three forages. Again, the outcomes have much to do with the relationship between inputs and yield.

For instance, although bermudagrass produces a tremendous amount of hay (6 tons per acre), it also requires substantial inputs to do so. Conversely, natives produced considerably less (4 tons per acre) but required much less fertilizer.

The higher the fertilizer prices, the greater the difference between the lower-input natives and the higher-input bermudagrass. To illustrate this point, we compared break-even prices of hay at nitrogen (urea) costs of $400 and $800 per ton. In this scenario, the lower-input natives broke even at approximately $58 and $62 per ton ($400 N versus $800 N) and for bermudagrass, those same figures were approximately $76 and $92 per ton – a

Continued on page 24

Native grass forages – How good is the investment?

cont'd from page 22

much more substantial difference.

Another important way to evaluate the value of an investment is net return. In a more recent analysis, we compared annual gross returns less annualized pasture costs using average market prices in Tennessee for steers over the past 10 years. We used these figures and a discount rate of 5.5 percent and an inflation rate of 2.5 percent to calculate net returns associated with marketing steers in May (post-weaning) versus keeping them through the summer on native grass pastures. Production data for this analysis came from the first of the two grazing trials mentioned above, a project conducted at two research and education centers in Tennessee.

The result of the additional 100 days of grazing on native grass pastures was that we gained approximately 400 pounds per acre (370 on big bluestem/indiangrass and 435 pounds on switchgrass) of additional beef worth approximately $469 (assuming an August price of $1.17 per pound). In terms of net returns, this worked out to be somewhere between $78 and $430 per acre. There were differences in the species with switchgrass producing more gain per acre and, therefore, higher net returns than the big bluestem/indiangrass blend. Despite higher average daily gains on the big bluestem/indiangrass blend (2.12 versus 1.75 pounds per day over the three years of the trial), the heavier stocking (about 1.5 times greater) allowed by the switchgrass produced greater per-acre gains.

As expected, there was also annual variation as a result, we assume, of weather and other factors. We also believe, though, that some of the variation we saw among years and between the two locations we examined were a result of grazing management. With the tall-growing native grasses, maintaining ample canopy leads to longer grazing duration and higher daily gains.

Finally, we evaluated the economics of grazing bred dairy heifers on native grasses. We used the same approach to develop pasture costs and for determining the cost of grazing. We used production data from the second grazing experiment in which we had used dairy heifers.

Rather than comparing marketing in May versus August as we did for the beef steers, we simply compared the gains and associated costs from the heifer grazing trial to three alternative rations: wet distillers grains, corn silage-soybean meal and corn silage-dry distillers grain.

Costs per animal unit day for grazing ranged from $0.30 to $0.88 for the two native grass treatments, switchgrass and the big bluestem/indiangrass blend, depending on year. By contrast, the daily costs of the rations were more expensive. Assuming a low yardage fee ($0.35 per head per day), the cost per animal unit per day on a diet that would achieve the same rate of gain as we had achieved on the native grass ranged from $1.91 (switchgrass equivalent on the corn-dry distillers grain ration) to $2.89 (big bluestem/indiangrass blend equivalent on the corn silage-soybean meal ration). At high yardage fees ($0.45 per head per day), the costs for these same two comparisons were $2.01 and $2.99, respectively. Clearly, native grass pastures deliver gain at a much lower rate than blended rations.

Taken together, these various evaluations of the economics of native grass forages make several things clear. First, native grasses, switchgrass or the big bluestem/indiangrass blend, produce gain at lower cost than other common summer pasture alternatives. They also produce hay more cheaply than those same alternatives. Second, the competitive advantage of native grasses increases as fertilizer input costs increase. We also see that the net returns on the gains that natives produce can be substantial, as much as $430 per acre. Finally, natives provide gain for replacement heifers at a rate that is substantially less expensive than several common rations. In short, native grasses make good economic sense and are a competitive option for providing summer grazing or for hay production. **FG**

For more information on this subject, please see a technical bulletin on this subject, Economic Implications of Growing Native Warm-season Grasses for Forage in the Mid-South (SP731-E), available at www.utk.edu

Chris Boyer is an assistant professor in agricultural and resources economics at the University of Tennessee.

Patrick Keyser
Professor and Director
Center for Native Grasslands Management
University of Tennessee
pkeyser@utk.edu

www.progressiveforage.com