Managing the Pasture Fertilization Budget for a South Florida Ranch

F.M. Pate
Range Cattle Research and Education Center
University of Florida, Ona

The following are introductory comments to a panel discussion by 5 south Florida ranchers relating to managing a pasture fertilization budget on a commercial ranch.

Less than 15 years ago, we at the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) were of the understanding that we could take soil samples from a pasture and make recommendations on fertilizer needs. Because soil tests usually showed low and very low levels of phosphorus and potassium, UF/IFAS almost always recommended maximum levels of phosphate and potash. A typical recommendation for bahiagrass pasture was 120 lb nitrogen, 80 lb P_2O_5 and 80 lb K_2O per acre, or 400 lb 15-10-10 per acre, applied twice annually.

In the mid 1980s, several county extension and research faculty at IFAS recognized that the UF/IFAS recommendations were economically prohibitive. Additionally, they felt that there was seldom a response to phosphate and potash applied to bahiagrass. Most ranchers had already realized that this was an impractical level of fertilization and few followed these recommendations.

Research conducted at Ona in the early 1960s showed that there was not an economical response to phosphate and potash fertilizer applied to bahiagrass (McCaleb et al., 1966). More importantly, there were no published research data anywhere that showed an economical response by bahiagrass to phosphate or potash. It appears that the old UF/IFAS recommendations were developed when fertilizer was inexpensive, and rather liberal levels of phosphate and potash were recommended as insurance factors.

To gain more information on the response of bahiagrass to phosphate and potash fertilization, a research/demonstration study was initiated in 1986 by the South Florida Beef–Forage Extension Group (Sumner et al., 1991). An experimental site was located in each of 9 counties in south–central Florida. The research sites were on commercial cattle ranches, and the study was conducted under grazing conditions over 3 years. In summary, there was not an economical response by bahiagrass to phosphate and potash fertilization, and results convincingly demonstrated that UF/IFAS fertilizer recommendations should be revised. Results also showed that soil tests were of no value in determining phosphate and potash recommendations for bahiagrass pasture.

At the same time (1986) the Range Cattle Research and Education Center hired a young soil scientist, Dr. Jack Rechcigl. Because of phosphorus problems in south Florida waters, Dr. Rechcigl's interest was in establishing the phosphate requirements of perennial grasses, starting with bahiagrass. He conducted detailed studies at the Range Cattle REC and on the Williamson Cattle Company ranch near Okeechobee. Results of these studies agreed with those obtained by the South Florida Beef–Forage Extension Group; established bahiagrass pasture does not show an economical response to phosphate fertilization. More importantly, Dr. Rechcigl was able to show that the massive root system of bahiagrass was active down into the hardpan, which constitutes a rich source of available phosphorus, explaining why there was no response to phosphate fertilization.

In 1988, the Range Cattle REC discontinued using phosphate and potash on approximately

1,000 acres of bahiagrass pasture. After 10 years there has been no noticeable decline in forage yield or cattle performance, with no reduction in stocking rate. In 1989, several large ranches also discontinued using phosphate and potash. To date they have not observed any reduction in grass growth or cattle production.

Based on the results of the above-mentioned research, other published data, and long-term experiences with using only nitrogen on large acreages of bahiagrass pasture, the UF/IFAS fertilizer recommendations for established bahiagrass pasture were recently revised. For south Florida, UF/IFAS now recommends 60 lb nitrogen per acre, applied in late February or early March. No phosphate or potash is recommended for established bahiagrass, regardless of nitrogen level. And UF/IFAS does not recommend fall fertilization of bahiagrass because research data showed very little yield response to nitrogen application (Sumner et al., 1991). However, many ranchers feel that fall fertilization is viable because it makes bahiagrass more palatable to grazing cattle. Such practice will be discussed by several participants on this panel.

Dr. Rechcigl, Dr. Rob Kalmbacher, and Dr. Martin Adjei (1998) have completed studies that indicate Floralta limpograss (*Hemarthria*) requires considerably less phosphate and potash than UF/IFAS recommends. They are presently conducting additional studies to better understand the fertilization requirements of Floralta and the UF/IFAS recommendation for this grass will probably be revised in the future.

Every ranching situation and every year is different, relative to management decisions and economics of cattle production. For example Mr. Ralph Pelaez, a participant on this producer panel, leases bahiagrass pasture for cow–calf production. With fertilization, he can graze a cow on 3 acres of bahiagrass pasture. Without fertilization, Ralph can graze a cow on 4 acres of bahiagrass pasture. Economics often dictates that it is more profitable to lease an additional acre of pasture per cow than to buy nitrogen fertilizer. This is a logical decision based on research data, which showed that nitrogen fertilization increases yield but does not greatly increase the quality of bahiagrass. Dr. Paul Genho, at Deseret Ranch, determined that it is more productive to spend fertilizer-budget dollars to fertilize Floralta limpograss rather than bahiagrass. His decision is based on research that shows there is a much better response in yield and quality by Floralta to a spring application of nitrogen than by bahiagrass.

Participants on this panel will be discussing innovative fertilization practices they employ in their ranching operations, which allow them to produce beef more economically. They are aware of the research data available and UF/IFAS recommendations, and they use this information to make logical decisions to develop economical fertilization practices. They know that bahiagrass offers a lot of flexibility relative to fertilization, and levels of application can be varied depending upon management needs and economic conditions. They know that these fertilization options can be implemented and still maintain a sustainable forage production program over many years.

References

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