

Getting the most out of your fertilizer dollar

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With commercial nitrogen prices likely to reach or exceed \$0.50 per unit this summer, forward-thinking producers are searching for ways to decrease nitrogen fertilizer costs for pastures and hayfields. Maintaining proper soil pH, altering nitrogen rates on hayfields to “optimize” production, selecting species tolerant of low fertility, incorporating annual or perennial legumes, and utilizing byproduct nutrient sources can improve the efficiency and effectiveness of nitrogen in pasture systems.

Maintain proper soil pH.

Maintaining proper pH through liming is one of the least appreciated management practices in forage systems. Even though tall fescue and bermudagrass are tolerant of relatively low soil pH; plant uptake of nutrients is most effective when soil pH is maintained in the proper range. Soil sampling to the proper depth at least every 2 or 3 years and adherence to recommendations will pay dividends to pastures.

Optimize nutrient inputs for hay production.

Several years ago Dr. Myron Parker on the Tifton Campus summarized hundreds of bermudagrass fertility trials conducted across the United States. In this summary, the effects of various nitrogen and hay prices on the economically optimal rate of N fertilizer were examined.

Table 1. Influence of nitrogen rate and hay value in determining return per acre of nonirrigated Coastal bermudagrass. From: Parker, Gates and McCluskey.

Hay value, \$ per ton	Nitrogen Cost/lb	Total lbs nitrogen applied per season				
		0	100	200	300	400
50	\$0.26	38	57	63*	60	-
50	\$0.40	38	43*	35	18	-
70	\$0.26	71	135	174	195	202*
70	\$0.40	71	121	146	153*	146

* Denotes maximum return over variable costs per acre.

Several years ago when N was priced around \$0.26 per unit and hay was valued at \$50 per ton, it paid to apply 200 lbs of N per acre over the bermudagrass hay season. Since N costs have increased to around \$0.40 per unit, optimal economic returns per acre (above variable costs) are reached at the 100 unit per season rate. Hay yields at this fertility rate will undoubtedly decrease, so producers need to weigh the costs of producing additional hay versus purchasing it. If good quality bermudagrass hay can be purchased from neighbors at \$50 per ton this year, it would probably be wise to do so. When higher value hay is produced, it pays to apply higher N rates. Notice that when hay is valued at \$70 per ton, 300 units of N per acre was determined to be economically optimal.

Nitrogen should also be applied to bermudagrass pastures and hayfields in split applications. This improves the efficiency at which plants utilize this nutrient and decreases the potential for leaching losses.

Select species tolerant of low fertility.

This is not a practice we typically advocate, but it may be applicable for certain types of cattle producers. Some forage species do not produce high yields like hybrid bermudagrass, but are relatively productive under low fertility situations. Bahiagrass is a warm season perennial forage available to south Georgia producers. Bahiagrass is tolerant of poor drainage, droughty soils, heavy grazing and low N, P and K inputs. In north Georgia, tall fescue, annual lespedeza and sericia lespedeza are also tolerant of low fertility. Be aware that stocking rates must be decreased in these low fertility situations.

Incorporate annual or perennial legumes into pastures.

Legumes can capture atmospheric nitrogen and “fix” it into a form that companion grasses can utilize. Annual clovers like crimson and arrowleaf can fix over 75 units of N per acre and perennials like red and white clover can fix over 150 units of N each season. While it is too late to overseed cool season legumes into tall fescue or bermudagrass pastures this year, consider adding them this fall to pastures with adequate pH, P and K levels. The fixed nitrogen will more than pay for the seed and the increased grazing days and forage quality will be a nice bonus for your cattle. Most annual clovers must be replanted every year due to undependable reseeding, and perennial clovers normally last only one or two years when overseeded in bermudagrass.

Utilize byproduct nutrient sources.

Why spend hard-earned money on commercial fertilizer when poultry litter can often be purchased for less money? Search for litter sources in your area. With ammonium nitrate costs steadily rising, it may also pay to ship litter greater distances this year. A “typical” ton of poultry litter contains 60 lbs of N, 60 lbs of P₂O₅, and 40 lbs of K₂O. If only the nitrogen is credited at \$0.40 per unit and this nitrogen is 60% available, a ton of litter is worth approximately \$15 applied. Of course, additional value can be credited for the potash and phosphate present in the litter. Be sure to test poultry litter for nutrient composition as nitrogen content can vary widely. Some litter may only contain 20 pounds of nitrogen per ton, which would only be worth \$4.80 per ton using the above assumptions. A website is available which lists poultry litter sources. This website can be accessed at <http://www.galitter.org>.

Another potential byproduct source is wood ash. This product supplies potassium for the soil and raise soil pH. If potassium levels or soil pH is too low, stands can thin or nitrogen fertilizers will not be efficiently utilized.

Summary

While it is difficult to totally eliminate N applications on grass pastures, hopefully these tips can decrease dependence on inorganic fertilizer sources. Closely examine purchase price of locally produced hay. It may be more economical to buy rather than produce bermudagrass hay this year. Closely examine low input forages that, although less productive, can fit into cow-calf grazing systems. Legumes and poultry litter are also excellent sources of nitrogen which can benefit pastures and hayfields.