

MAKING THE MOST OUT OF YOUR FERTILIZER BILL

March 2008 Georgia Cattleman
Dennis Hancock, Forage Extension Specialist
The University of Georgia

If you haven't started checking fertilizer prices, you might want to sharpen your pencil and put new batteries in the calculator. At some point in time, you are going to ask yourself the inevitable "Can I afford to fertilize?" However, this is definitely not the time to start cutting corners on soil fertility. Perhaps the more important question is, "Can you afford NOT to fertilize?"

Nitrogen Fertilization Strategies

There is no question that if we cut back on nitrogen (N), yields and quality will suffer (Figure 1). Numerous studies have shown that bermudagrass yields are directly proportional to the amount of N applied, up to a rate of 400 lbs of N/acre. Crude protein also responds to N fertilization. Don't be deceived, though. High nitrate levels can artificially inflate crude protein values. Extremely high N rates (above 300 lbs of N/acre) often result in high nitrate concentrations.

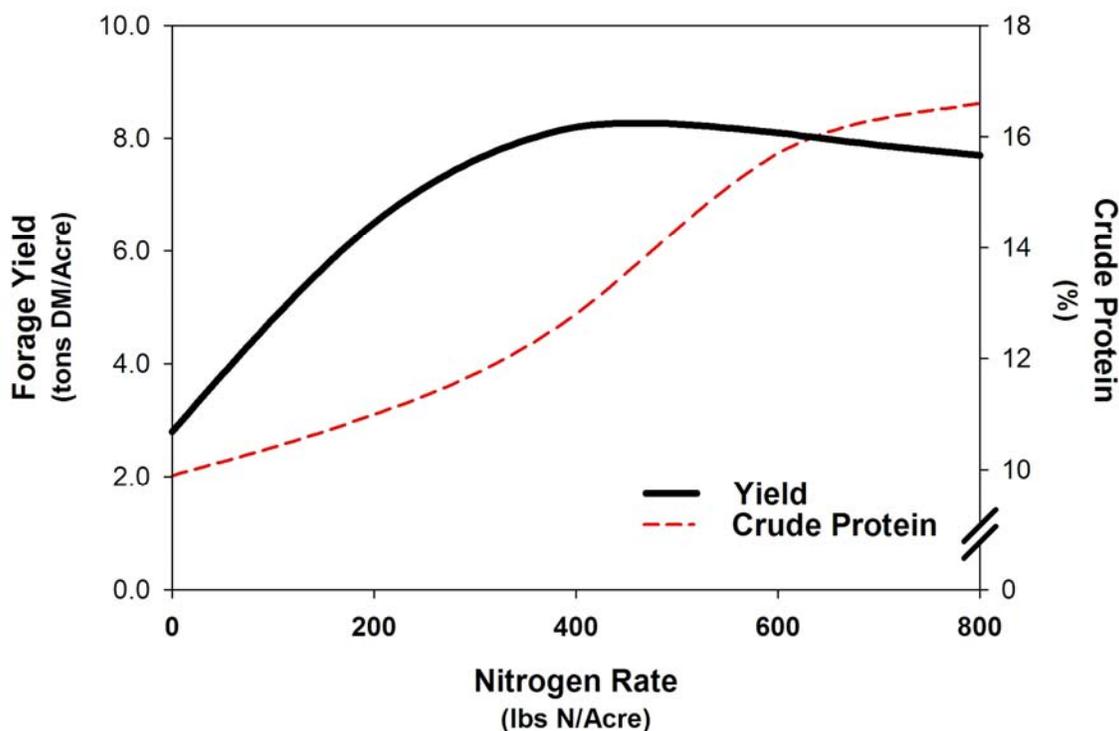


Figure 1. The effect of nitrogen fertility on the forage yield and crude protein content of dryland 'Coastal' bermudagrass (adapted from Burton et al, 1963;1969; Holt and Lancaster, 1968). Note: toxic concentrations of nitrates and negative environmental effects are more probable when N application rates exceed 300 lbs N/acre.

This relationship between N and bermudagrass yield generally holds true, even in a drought year. However, the yield increase from adding N may not cover the cost of the N in a drought year. Plus, under drought conditions, high nitrate levels may appear even at moderate N fertilization rates (above 150 lbs of N/acre). Wouldn't it be nice if we could adjust the N rate throughout the season to compensate for dry weather?

Hedge Your Bets

By splitting up your N applications, you CAN compensate for dry weather! Despite the added cost, making split applications can actually save you money in some years and will almost always give you “more bang for the buck” (i.e., it greatly increases the N use efficiency). Since adjustments can be made every few weeks, split N applications can insulate the investment in N against dry or wet (hopefully) weather, N losses (e.g., volatilization, leaching), and nitrate accumulation in the forage.

Potash Improves Stand Density

Potash (K) is absolutely critical to many aspects of plant growth, particularly under periods of stress. In fact, it is so important to bermudagrass that K concentrations in leaf and stem tissue are nearly equivalent to their N concentrations. Yet, K is too often the first nutrient that is neglected when hay producers order their fertilizer. In fact, a summary of soil samples received from 1997-2006 showed that K was deficient in a whopping 83% of hybrid bermudagrass fields.

A potassium deficiency can take many guises (e.g., increased leaf spot disease pressure, poor vigor, etc.). Ultimately, the end result of poor K fertilization is a very weak plant. When K deficiency is combined with severe environmental stress, the resulting stand loss can be dramatic. Evidence of this can be seen throughout Georgia in grass hayfields and pastures. Severe stand losses occurred as a result of the devastating Easter freeze and extreme drought in 2007.

Though K is not a miracle worker, proper fertilization of bermudagrass with K can increase stand density (Figure 2). Research from Texas has shown, for example, that *rhizome production increased by nearly 800% when K was appropriately applied* to K-deficient soil. Additionally, studies in Louisiana have shown that K deficiency is most problematic when drought limits yield. They found that bermudagrass plots that were provided recommended rates of K were 50% more efficient with the rainfall they received than K-deprived plots.

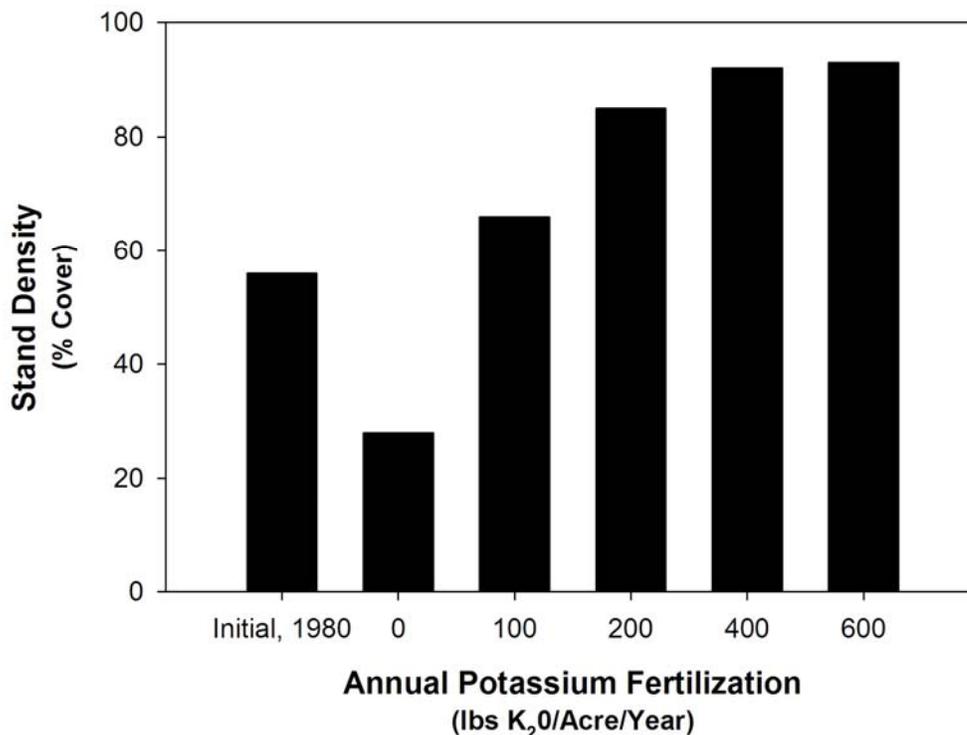


Figure 2. Five years after discovering a K deficiency, annual applications of potassium fertilizer had greatly improved the spring stand density of ‘Coastal’ bermudagrass (Eichorn, 1987).

Test Your Soil and Follow UGA Recommendations

Of course, the best way to keep the fertilizer bill to a minimum without sacrificing too much yield or forage quality is to know exactly what the soil needs. Soil testing is absolutely critical to making the most of your fertilizer investment. By submitting soil samples through your local Cooperative Extension office, you will receive the results along with recommendations on exactly how much fertilizer (if any) is needed.

To learn more about the implications of soil fertility on hay and pasture productivity, check out our website at www.georgiaforages.com or contact your local University of Georgia Cooperative Extension office. You can also learn how to collect soil samples and receive fertilizer recommendations from UGA agronomists by visiting our website or consulting with your county Extension Agent.