

# Investing For Dependable Returns

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**I**nvesting wisely is necessary for a profitable return on the investment. This is certainly true when it comes to fertilizing for hay production. Unlike pastures where there is some recycling of nutrients, hay production removes the nutrients from the field with each cutting so they must be replaced or yields will rapidly decline.

Hay is an important commodity in Georgia, valued at over \$102 million in 1996 which is well above the crop value of wheat at \$74 million or soybean at \$67 million. Commercial production of high quality hay for sale to dairies and horse owners offers substantial opportunity. The two main hay crops in Georgia are hybrid bermudagrass and tall fescue. Both grasses are capable of high yields if adequately fertilized and limed. Nutrient removal by hay crops of these grasses is substantial:

## Nitrogen

Nitrogen fertilization generally gives the greatest forage yield response of any nutrient but also increases the protein content of the hay. More nitrogen fertilizer must be applied than is removed by the hay crop. This is because some of the fertilizer nitrogen is lost by soil leaching and runoff during rains.

How much actual nitrogen should be applied for optimum yields of hybrid bermudagrass hay? A general recommendation is to apply 80 to 100 lb N/acre in spring before rapid growth begins and a similar amount after each harvest with the last application of nitrogen being no later than September 1. Where bermudagrass hay is cut every 4 to 5 weeks for high quality, this means a total of at least 400 lb N/acre during the season to produce 6 tons/acre or more of hay. For tall fescue being used only for

fertilizer will result in low yields of hay even though adequate nitrogen was applied. Many grass hayfields are fertilized with nitrogen but little or no potash, resulting in poor growth and increased weed encroachment. Hybrid bermudagrass, starved for potash, is less winter hardy and more susceptible to diseases, resulting in winter stand losses. Potassium removal is higher than nitrogen for hybrid bermudagrass and tall fescue. This means that adequate potash fertilizer must be applied each spring according to soil test results. Leaching of nutrients is a greater problem on sandy soils in southern Georgia so split applications of potash during summer are desirable on hybrid bermudagrass. One spring application of potash should be sufficient on tall fescue grown mainly on clay soils.

## Sulfur

Although sulfur removal by the hay crop is not high, this element can become limiting on sandy soils where hybrid bermudagrass is heavily fertilized with nitrogen. If bermudagrass has been fertilized with nitrogen and still is a light green or even yellow-green color with poor growth, sulfur deficiency is likely and this element will need to be added.

## Lime

Bermudagrass and tall fescue are both quite tolerant of moderate soil acidity but where high rates of nitrogen fertilizer are applied, the soil will become more acid and liming is desirable. At a soil pH level near 5 or lower, phosphorus becomes less available to the grass. Dolomitic limestone, used to offset soil acidity, also supplies the essential nutrient elements, calcium and magnesium, for good grass growth.

## Investment for profit

Sensible investment in plant nutrients can furnish good bermudagrass and tall fescue hay yields without wasting money. Soil testing and applying only the needed nutrients at the proper rates can grow high quality hay, cut costs, and improve profit potential.

### Pounds of nutrients removed in hay

Nutrient element	Hybrid Bermudagrass	Tall fescue
	6 tons hay/acre	3.5 tons hay/acre
Nitrogen (N)	258	135
Phosphate (P <sub>2</sub> O <sub>5</sub> )	60	65
Potash (K <sub>2</sub> O)	288	185
Sulfur (S)	30	14

It is apparent that removal of the major nutrients differs greatly and that wise investment is necessary to avoid either wasting nutrients or short-changing the grass plants. Guessing nutrient needs is a poor way to fertilize for hay production as one may end up spending too much on the wrong nutrient and not enough for another. Therefore, it is essential to know how much your soil contains and how much of each nutrient is needed to grow the hay crop. Soil testing is the only way one can determine the phosphate and potash needs. Investment in soil testing can pay handsome dividends in savings of unneeded nutrients as well as knowing how much fertilizer to apply. Since soil testing cannot be used for determining nitrogen status of the soil, nitrogen application rates recommended are based on research from fertilizer yield trials with that grass.

hay production, one should be able to get three cuts of hay each year. An application of 70 to 80 lb N/acre should be applied in early spring, a second one after the first hay cut at boot stage, and a third application in late August or September.

## Phosphate

Phosphorus does not leach from the soil so one application per year, based on soil test results, is sufficient for hay production. Shortages of this element are much less likely to be a problem than for nitrogen or potassium. If poultry litter is used as the fertilizer, the large amounts normally applied to obtain adequate nitrogen will often result in high levels of soil phosphorus.

## Potash

Inadequate investment in potash