

Myths and Facts about Producing Quality Hay
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Hay quality is influenced by a variety of factors including forage variety, soil fertility, plant maturity at harvest, and method of storage. Harvesting and storing quality hay can increase forage crop value by opening markets that offer premium prices or by reducing supplemental feed costs for your own beef herd. When fields are managed to produce high quality hay, timely management and increased attention to soil fertility should also increase the vigor and productivity of the pasture and improve hay production efficiency over the long term. In this article, several misconceptions about hay production will be addressed as well as a few facts that will help you produce and feed higher quality hay.

Myth #1: You cannot produce good quality hay without the latest and greatest forage variety.

While forage quality is influenced by cultivar, too much influence is placed on this single hay quality factor. Other production practices like fertility and harvest timing influence hay yields and quality to a greater extent. This does not mean that forage variety is unimportant. When managed similarly, Tifton 85 bermudagrass is higher yielding and more digestible than other bermudagrass hybrids. However, matching variety to environmental conditions is much more important than selecting a variety based only on forage quality. For example, the greater yield and quality of Tifton 85 is worth little if stands are lost to cold damage in north Georgia. Variety selection should be based on multiple factors including quality, yield, establishment rate, grazing tolerance, environmental compatibility, and producer management style.

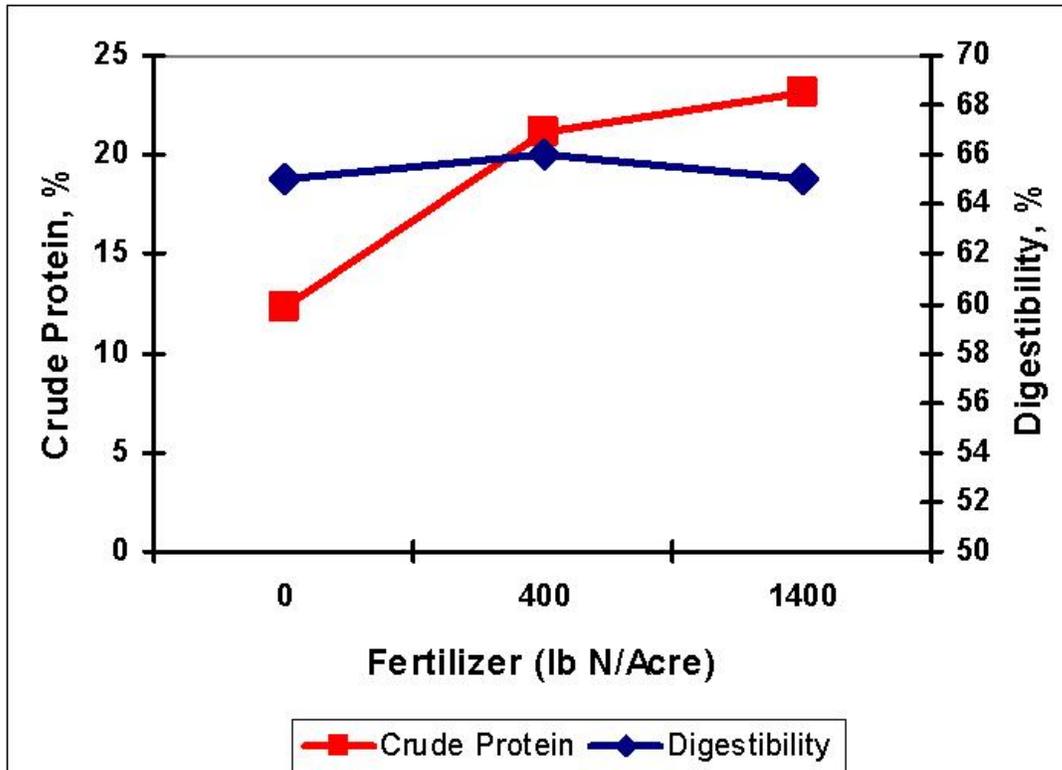
Tall fescue varieties appear to influence forage quality to a lesser extent than bermudagrass varieties. In a study conducted at the University of Georgia, three endophyte-free fescue varieties were harvested and analyzed for hay quality. Variety did not greatly affect hay quality, but there were different yield patterns between cultivars. Some varieties produced more forage in late winter and early spring than other varieties, which may indirectly influence hay quality by shifting baling earlier in the spring during rainy weather.

Although not a variety effect, tall fescue infected with toxic endophytes should not be considered high quality hay. Hay tests of toxic tall fescue may indicate high crude protein and total digestible nutrient content, but the toxic endophyte will decrease animal performance regardless of forage nutrient content.

Myth #2: Heavily fertilizing pastures will increase hay energy content.

Soil fertility is strongly related to forage yield and crude protein content, but does not influence the energy content of hay. Figure 1 shows that crude protein content of bermudagrass hay does indeed improve with high application rates of nitrogen.

Figure 1. Effect of nitrogen fertilization rate on Coastal bermudagrass crude protein content and digestibility. (Burton et al.)

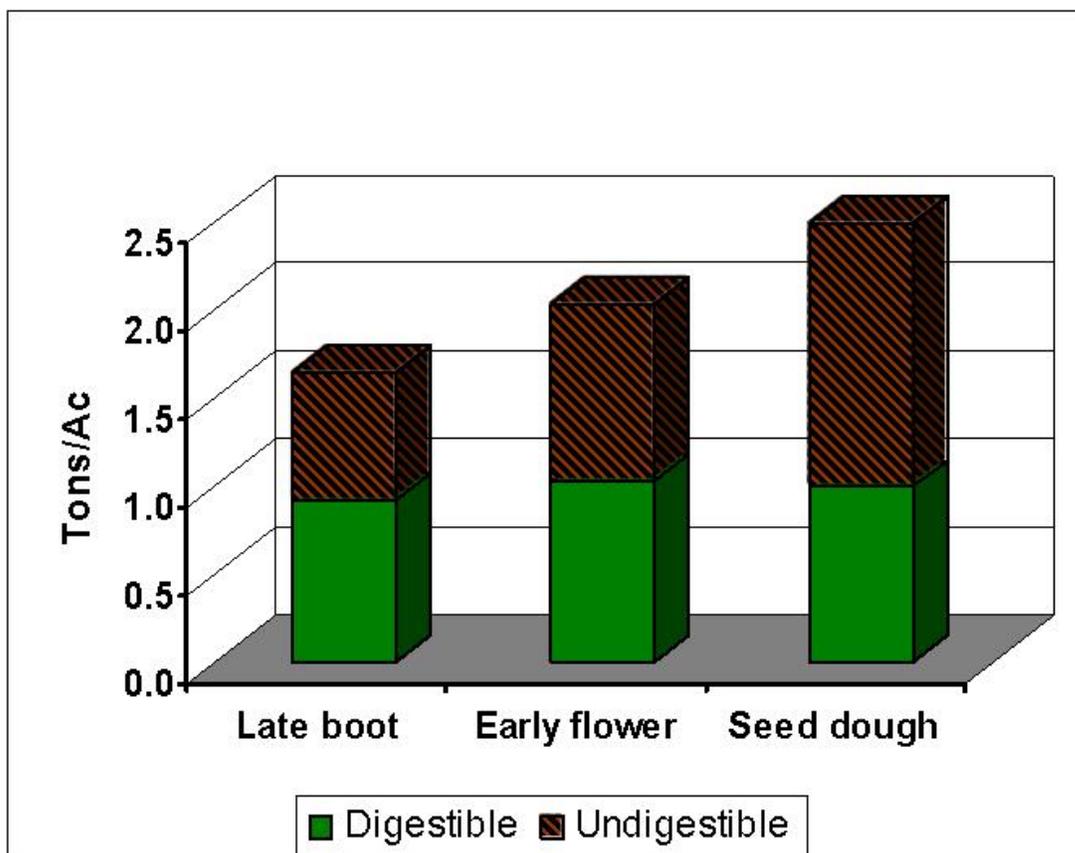


As annual nitrogen application rates increased, yields of bermudagrass were also dramatically improved. However, forage digestibility did not increase with high rates of nitrogen fertilizer. Similar to the overemphasis placed on varieties and forage quality, too much importance has also been placed on the crude protein content of hay. Digestibility or total digestible nutrients (TDN) is a much more important factor that affects the feeding value of your hay supply. When people diet to lose weight, they don't decrease crude protein intake, but instead focus on the number of calories they eat. The same should be true when formulating winter diets for your cattle. Available calories in hay is usually the most limiting factor for animal performance. The TDN level is highly related to the available calories in the hay and affects cattle performance to a much greater extent than crude protein. If your forage analysis indicates that you have low TDN or energy content, more attention should be placed on managing the maturity at which your forages are harvested.

Fact #1: Plant maturity at harvest is the most important single factor that influences hay quality.

Figure 2 shows the effect of harvest timing on yield and quality of tall fescue hay. Overall yield of fescue hay increases if harvest is delayed until the soft seed stage of growth. However, hay digestibility decreases as cutting date is delayed and results in a net decrease in digestible hay harvested. Crude protein content of this fescue hay also declined from 14% to 7% as the forage matured. In order to harvest high quality hay, forage must be cut in a vegetative stage of maturity.

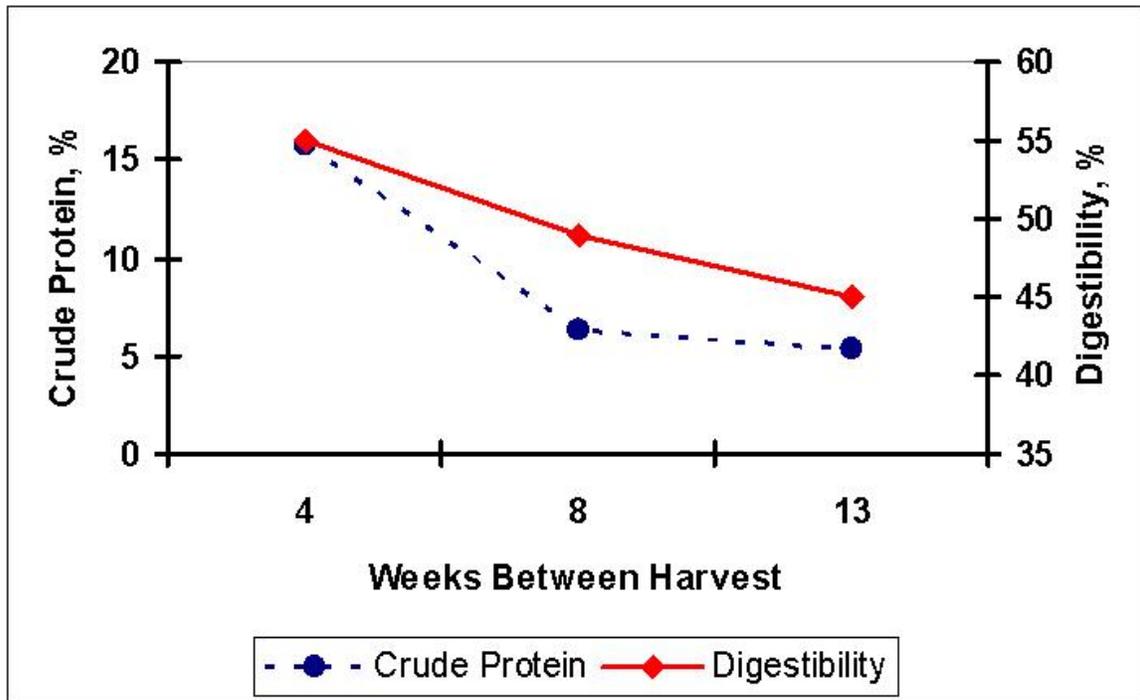
Figure 2. Effect of harvest timing on total and digestible yield of tall fescue. Total height of bar represents total hay yield and height of black bar represents calculated digestible yield. (Hoveland et al.)



The frequency at which bermudagrass is harvested also impacts hay quality. In a study conducted in Tifton, increasing the length of time between hay cuttings decreased the crude protein content and digestibility of Coastal bermudagrass hay (Figure 3). As forage plants mature, leafy digestible plant portions are diluted with less digestible stems. This decreases overall digestibility and lowers the digestible energy content of the hay. Yield is decreased with short harvest intervals, but harvesting hybrid bermudagrass at 4 to 5 week intervals will produce good yields of high quality hay. If a premium can be obtained for this

increased quality or if lower supplemental feed costs for the cow herd are credited to the hay operation, these lower yields can be justified economically.

Figure 3. Crude protein content and dry matter digestibility of Coastal bermudagrass harvested at increasing intervals. (McCullough and Burton)



These figures demonstrate that plant maturity greatly impacts hay quality. If plants are not harvested at the proper maturity, quality will be poor regardless of forage variety or soil fertility. Current recommendations for high quality hay production are to harvest the first cutting of hybrid bermudagrass at 15-18 inches height with subsequent cuttings at 4-5 week intervals. At the very latest, tall fescue should be cut during spring in the early flower stage (seedheads just beginning to emerge from the stem). If higher energy content is desired, harvest fescue in the mid to late boot stage of growth (stem swollen but seedhead not emerging). It is important to remember that below average varieties can be managed to produce high quality hay and excellent varieties can be mismanaged to produce terrible quality hay.

Fact #2: More hay can be lost during storage than during harvest.

The potential for rain-damaged hay does not end with baling. Substantial losses of yield and digestibility occur after hay is removed from the field. Georgia's warm and humid weather can result in 30% losses of dry matter from round hay bales stored outside and unprotected from the weather. In addition to high dry matter losses, weathered hay is less digestible and often refused by animals. If you want to produce and feed quality hay, bale protection from weather is essential.