



A delayed hay harvest may not only reduce forage quality, but it can negatively affect livestock condition and field management in the long run.

# THE DOMINO EFFECT OF DELAYED CUTTING

by Jennifer Tucker

**A**FTER 13 years of working in extension, I can say that the only constant is change. The same can be said about our weather. During our regular research updates, one key topic we must focus on during each summation is variances in production outcomes due to environmental differences each year — even in the same research station field. During my time in Georgia, I've learned that May is unusually dry — except when it's not; drought is guaranteed in the summer — except when it rains; and a killing frost in the fall will shut down a forage crop — except in years that a killing frost does not occur until January.

As such, unpredictable rainfall can wreak havoc when your operation is

heavily reliant on the successful production of stored forages. The overall goals for producing stored forage should be efficient and profitable production and optimum utilization of a forage base that is able to provide high-quality stored feed during forage deficiencies.

How do we achieve this? As the old saying goes, "Timing is everything!"

Good timing is not only essential for a prompt arrival at the E gates of the Hartsfield-Jackson airport in Atlanta but is also important in hay production. The timing of fertility and stage of maturity at harvest can govern enhancements or deficits in forage quality and the profitability of the product being harvested. Mechanically harvesting forage results in high amounts of fertility being removed from the soil annually. Taking annual soil tests and making split applications of fertilizer as recommended by soil anal-

ysis will have a positive impact on stand persistence and forage quality. However, the stage of maturity at harvest is the single most important producer-controlled factor influencing forage quality, and thus, profitability.

Harvesting forage at the recommended stage of growth can deliver a palatable, digestible, and high-quality product. Delaying harvest for even a short period and allowing forage to exceed the recommended stage of maturity will result in a lower quality product. Remember, as the quantity goes up, quality goes down, and forage quality deteriorates at a faster rate as our forage continues to mature.

Delaying harvest has significant visible and nonvisible impacts. The following photo was captured during a har-

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vest date evaluation at the University of Georgia Tifton Campus. This is a great visual of what happens when we delay our harvest. We can easily see that as time progresses, forage grows taller. As such, there is lower leaf and greater stem growth. What we might not be able to see, however, is the inversely related impact on quality (Table 1). The more we delay harvest beyond optimum maturity, the more fibrous the material becomes, the more lignin is produced, and the less digestible the product is for our livestock. An efficient utilization of our forage base can easily be determined by animal performance.

### Compounding effects

The summer of 2013 will be one of those summers that I, as well as many others in the region, will remember forever. Continuous, almost daily summer rainfall caused significant delays of harvesting any forage material, hay or silage. When the weather cleared enough to finally put up some dry hay, the hay was several weeks beyond peak performance, and the quality was poor at best. For reference, the average relative forage quality (RFQ) of bermudagrass samples submitted to the University of Georgia was 80 that year, compared to the prior seven-year average of 95 RFQ. The impacts of storing poor-quality forage linger and compound in many ways, creating a domino effect, especially in adverse weather conditions.

**DOMINO NUMBER ONE: We can't meet livestock needs.** If we consider when we are most prone to feeding hay, it is not when the weather is good and growing forage is abundant, but rather when forage is dormant and animal needs cannot be met by grazing. Historically, forage deficits occur during the winter months in the Southeast when days are short and temperatures are cold; however, over the past 10 years, significant periods of unexpected spring and extensive summer droughts have led to hay feeding much earlier and/or much longer in the year. This leads to an even greater reliance on high-quality hay.

Under these conditions, it is hard to meet the energy needs of our livestock, and it is near impossible to do so with poor-quality hay alone. For example, the nutrient requirements of a dry pregnant cow in terms of



As harvest is delayed, forage experiences less leaf growth and more stem growth.

energy and protein are 48% total digestible nutrients (TDN) and 7% crude protein (CP). If we refer to Table 1, these forage products are at acceptable levels even in the later harvest — but only for maintenance. If our cows are in peak or late lactation, those needs jump significantly to 60% and 55% TDN and 12% and 9% CP, respectively. Instead, we see that supplementation would be required to meet the needs of these cows based on our products above, especially in those later cuttings. This forage is also inadequate to meet the requirements of growing calves or breeding heifers. What's more is that these energy needs are elevated by adverse weather, especially in the cold.

**DOMINO NUMBER TWO: Loss of animal body condition.** When nutritional needs aren't met, animal body condition will drop. The goal is to maintain a body condition score (BCS) of 5 or greater, especially going into the winter months. If BCS drops below this level, animal reproductive efficiency can be negatively impacted, resulting in lower conception rates and longer calving intervals. A drop in body condition is not easily corrected and can take up to 70 days to reverse.

Setting a goal of maintaining a BCS of 5 or greater in the herd, as well as keeping a close eye on animal performance, helps manage and protect our operations when we get into situations

of nutrient deficiencies and restriction. One key tool in our forage toolbox is a forage test. By testing our hay and knowing the nutritional value, we can keep track of the nutrients available and make well-informed decisions for feeding, supplementation, and meeting animal needs. In essence, we can match our feed to our animal's needs before we see a drop in BCS.



### DOMINO NUMBER THREE: Amending the impacts of a delay.

Recent weather patterns in the Southeast proved challenging for dry hay producers earlier this year. A sustained spring drought followed by continuous rain in some areas led to significant harvest delays. As we talk about harvest timing, often we are posed with the question, "What happens when I can't get into my field?" One opportunity that is often overlooked in the region until we get into more significant wet seasons is harvesting our forage as baleage.

Baleage is forage that is harvested, wilted, baled at 40% to 60% moisture, wrapped in polyethylene plastic, and allowed to ensile. This is achievable in approximately two days, which is advantageous because we can maintain a more desirable harvest interval, targeting optimum quality and quantity. It is much easier to get a two-day window of ideal weather than it is to have a rain-free week, and the weather waiting game is where we often find ourselves in trouble.

If baleage isn't feasible, there are few other options to consider. First, if forage is very overmature, consider harvesting the field as a straw for bedding. We consider forage with 45% TDN or less to have no substantial feed value. Straw is still a beneficial and marketable alternative; however, it's not a sole feed option, especially during a hay shortage, which often occurs during adverse weather years. A forage test can best help you determine how the material should be used.

Avoid applying feed additives that encourage intake to very low-quality hay, as this can lead to impaction in the rumen and even death. Another option to consider is utilizing standing material as fertilizer in the field. As mentioned above, baling removes a significant amount of soil nutrients. If the field is significantly delayed, we can

recapture some of that fertility by simply mowing the field and allowing the mulch layer to deteriorate and redistribute itself into the soil. This method works best when you are already going into a seasonal forage transition and aren't likely to be able to get an additional quality from cutting until the next hay season. This mulch layer can provide cover, weed control, and fertility while the field is resting.

A third option is to graze forage. There are many times when we may not be able to get the right weather window to get our heavier equipment in the wet field, but we can easily get around on all-terrain vehicles (ATVs) or on horseback. Grazing to better utilize the slightly delayed forage is a great way to efficiently harvest the material and get some feeding value from it while also resetting the field for the next harvest. Grazing is most effective when you are able to stock the field heavily and graze it quickly to remove the material and then allow the field to rest and recover. As we continue through this harvest season, I pray that the great hay delay

Yield and quality characteristics at various intervals and stages of maturity					
Tifton-85 bermudagrass					
	Two weeks	Four weeks	Six weeks	Eight weeks	10 weeks
DM yield (lbs./acre)	5,517	7,326	9,732	10,501	13,723
CP %	16.5	14.5	10.3	10.4	9.7
NDF %	64.5	67.6	72.7	43.2	73.9
ADF %	33.3	35.1	38.9	39.0	40.0
TDN %	54.9	53.6	50.3	50.8	49.9
Kentucky-31 tall fescue					
	Two weeks	Four weeks	Boot	Soft-dough	Hard-dough
DM yield (lbs./acre)	2,177	2,042	3,024	2,996	2,850
CP %	20.8	18.2	14.7	14.6	9.8
NDF %	54.4	57.5	63.0	65.6	72.3
ADF %	29.1	31.6	35.4	38.1	42.6
TDN %	59.1	57.6	54.1	51.4	49.2
Adapted from Studstill et al. 2014, University of Georgia					

does not impact your operation. In the instance that you aren't able to avoid it, remember that unless you test, it's just a guess! Get a forage test and know the quality of your feed so you can match your animals' needs. ●

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