

# BUYING HAY VS RAISING HAY FOR BEEF PRODUCERS

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## INTRODUCTION

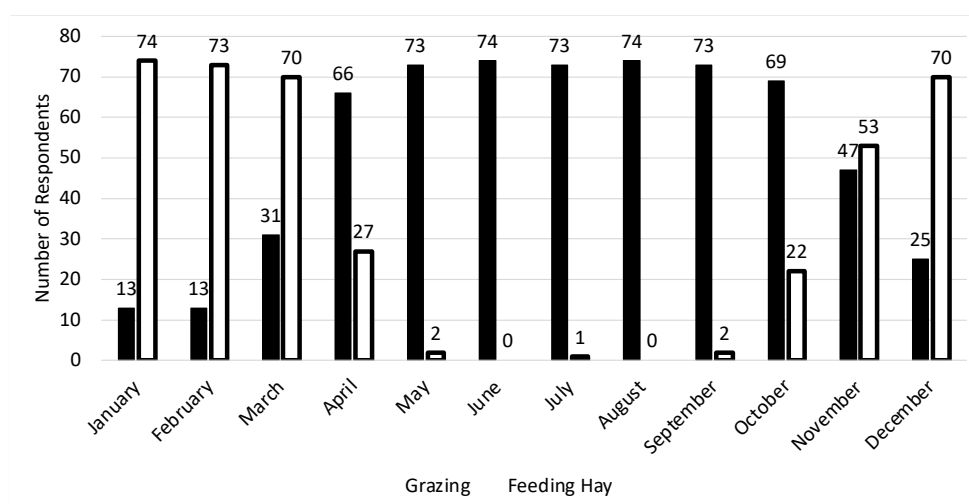
Throughout Tennessee, livestock producers often ask, “Should I be buying hay or raising hay?” The answer to that question depends on various factors, and both options have pros and cons. Table 1 displays common pros and cons of buying vs raising hay.

**Table 1. Pros and Cons of Buying Hay and Raising Hay<sup>4</sup>**

Buying Hay	Raising Hay
<b>Pros</b>	<b>Pros</b>
Utilize land for other purposes (i.e. increased grazing acreage)	Have controlled access to reliable/quality hay source
No additional labor required	Set-up to handle by-product/alternative feeds
Eliminates the need to purchase and maintain hay equipment	The producer has more cost control
Flexibility to purchase hay that suits the nutrient requirements of animals	
<b>Cons</b>	<b>Cons</b>
Possibly limited access to reliable/consistent hay source	Must purchase and maintain hay equipment, update old equipment
Limited price control	Might need additional labor
Limited control over volume/available bale sizes in the market	Not enough acreage to support investment in equipment
Unknown hay quality	Busy/limited time to devote to hay production
Hauling hay cost	Weather risks affecting hay production and harvesting

<sup>4</sup> Custom harvesting can migrate some of these pros and cons.

In addition to the reasons mentioned, the economic factors of the hay market come into play. In Tennessee, producers need hay at various times throughout the year. Figure 1 displays the average monthly grazing and feeding windows for Tennessee producers<sup>1</sup>.



Producer Grazing and Hay Feeding Months in Tennessee. Results from <sup>2024</sup> Master Beef Producer Survey (n=76)<sup>5</sup>.

<sup>1</sup> Results from a 2024 survey of Master Beef Producer Participants

<sup>5</sup> Producers were asked, “In a typical year, which months are you grazing and/or feeding hay? (click all that apply).”

Understanding the economics of the hay market and production costs can help most producers decide whether they should be buying or raising hay. This publication covers economic costs for various hay species in Tennessee and the costs associated with hay production.

## FACTORS THAT IMPACT HAY STOCKS

Having an adequate amount of hay for a feeding window can be achieved in different ways. Additionally, the economic value of the hay for a producer buying or raising hay comes into play when deciding how to accumulate hay. For producers buying hay, timing is critical for price. Buying hay when demand is high (i.e., peak hay feeding months, drought) can lead to purchasing hay at higher prices. Whereas, buying hay when demand is low can lead to securing hay at lower prices. In addition to planning your hay stocking strategy, having adequate on-farm storage helps producers take advantage of lower demand periods.

For producers raising hay, the amount of hay in stock is dictated by various factors. That is, hay stocks can be at the mercy of the prices associated with the inputs (fertilizer, fuel, chemicals, etc.), land availability and weather risks. Raising hay also has nutrient costs associated with hay production. Producing hay removes nutrients from the soil which affects the soil's long-term fertility and, consequently, the forage yield and quality. After a few years of producing hay, field maintenance and renovation costs need to be included in the budget. Thus, understanding the costs associated with long-term nutrient removal is critical to making the buying vs raising hay decision.

## NUTRIENT REMOVAL AMOUNTS AND COSTS

When hay is harvested and removed, nutrient amounts are exported or taken away from the field and soil. The amount of nutrients removed is dependent upon the forage type and yield. Table 2 displays the nutrient removal amounts based on hay samples submitted to the UT Soil, Plant, and Pest Center for forage analysis at the UT Beef and Forage Center. The amount of nutrients removed is based on a ton and for a 700-pound 4x5 wrapped round bale for each forage.

**Table 2. Nutrient Removal Amounts (pounds) for Various Forage Types in Tennessee.**

Forage Type	Pounds Per Ton			Pounds Per Bale <sup>6</sup>		
	N	P205	K20	N	P205	K20
Alfalfa	65.50	15.38	59.37	22.93	5.38	20.78
Annual Ryegrass	38.33	14.10	48.28	13.42	4.93	16.90
Bermudagrass	40.52	9.40	40.94	14.18	3.29	14.33
Cool-Season Annuals	34.63	10.38	46.56	12.12	3.63	16.30
Legumes	46.71	11.70	45.59	16.35	4.10	15.96
Mixed Grasses	35.94	9.72	38.90	12.58	3.40	13.62
Grass/Legume Mixture	42.74	10.03	50.37	14.96	3.51	17.63
Native Warm-Season Grasses	32.90	7.96	34.99	11.52	2.79	12.25
Orchardgrass	43.30	11.38	49.62	15.16	3.98	17.37
Small Grains	35.43	10.93	39.36	12.40	3.82	13.78
Tall Fescue	36.15	9.54	41.84	12.65	3.34	14.65
Warm-Season Annuals	36.42	10.82	46.57	12.75	3.79	16.30

Estimating the value of the nutrients removed is crucial to understanding the total economic costs. The value is calculated by multiplying each nutrient amount by their respective nutrient costs. Table 3 displays the nutrient removal value for each forage by ton and bale. The prices used for inputs were \$606.76/ton for Nitrogen (urea), \$882.43/ton for Phosphorous (DAP), and \$536.80/ton for Potassium (potash)<sup>2</sup>.

<sup>2</sup>Prices for inputs were taken from <https://www.ams.usda.gov/market-news/production-cost>. A local price can be used in the calculation for the per bale value.

<sup>6</sup>700 Pound 4X5 Wrapped Round Bale

**Table 3. Nutrient Removal Amounts (pounds) for Various Forage Types in Tennessee.**

Forage Type	Cost Per Ton (\$)			Cost Per Bale <sup>7</sup> (\$)		
	N	P205	K20	N	P205	K20
Alfalfa	19.87	6.79	17.58	6.95	2.38	5.58
Annual Ryegrass	11.63	6.22	12.96	4.07	2.18	4.54
Bermudagrass	12.29	4.15	10.99	4.30	1.45	3.85
Cool-Season Annuals	10.50	4.58	12.50	3.68	1.60	4.37
Legumes	14.17	5.16	12.24	4.96	1.81	4.28
Mixed Grasses	10.90	4.29	10.44	3.82	1.50	3.65
Grass/Legume Mixture	12.96	4.42	13.52	4.54	1.55	4.73
Native Warm-Season Grasses	9.98	3.51	9.39	3.49	1.23	3.29
Orchardgrass	13.14	5.02	13.32	4.60	1.76	4.66
Small Grains	10.75	4.82	10.56	3.76	1.69	3.70
Tall Fescue	10.97	4.21	11.23	3.84	1.47	3.93
Warm-Season Annuals	11.05	4.78	12.50	3.87	1.67	4.37

### PRODUCTION COSTS

In the 2023 Custom Rate Survey in Tennessee, the charges for mowing, raking and wrapping a bale of hay for various round bale sizes were: \$25.86 for a 4x5, \$37.50 for a 4x6, \$38.33 for a 5x5, and \$31.00 for a 5x6. For this analysis, it is going to be assumed these rates cover the hay equipment cost, equipment fixed cost, wrapping and labor.

### TOTAL COSTS<sup>3</sup>

By adding the nutrient removal values and custom rate charge for a bale of hay, the total cost of a bale allows producers to decide if they want to buy or raise hay. Table 4 displays the total value for a 700-pound 4X5 wrapped round bale for each forage type. If producers can raise hay near or below the total value of a given bale, then they could consider raising hay as an economically better decision. If raising hay, the value of the hay is what the bale is worth from a break-even standpoint. For example, a wrapped round bale of mixed grasses is valued at \$34.83/bale. If producers could raise hay below that price, then producers could lower their input cost of hay by raising their own hay. Of course, a round bale could be above this price (\$34.83/bale) in the market because the value is a break-even production price, and not the marketed price the value used for this publication doesn't account for the quality of the hay. Higher-quality hay can cost more in the marketplace, whereas, lower-quality hay could be equal to or lower than an average bale in Tennessee.

**Table 4. Nutrient Removal Amounts (pounds) for Various Forage Types in Tennessee.**

Forage Type	Total Nutrient Removal Cost	Bale Production Costs (Mow/Rake/Bale)	Total Value of Hay Bale
Alfalfa	14.91	25.86	40.77
Annual Ryegrass	10.78	25.86	36.64
Bermudagrass	9.60	25.86	35.46
Cool-Season Annuals	9.65	25.86	35.51
Legumes	11.05	25.86	36.91
Mixed Grasses	8.97	25.86	34.83
Grass/Legume Mixture	10.82	25.86	36.68
Native Warm-Season Grasses	8.01	25.86	33.87
Orchardgrass	11.02	25.86	36.88
Small Grains	9.15	25.86	35.01
Tall Fescue	9.24	25.86	35.10
Warm-Season Annuals	9.91	25.86	35.77

<sup>3</sup>The costs in this publication does not account for lime, chemicals and other variable costs.

<sup>7</sup>700 Pound 4X5 Wrapped Round Bale

## RECOMMENDATION

After calculating the total economic value of a desired round bale, a raising vs. buying decision can be made. If a Tennessee producer can produce hay that is similar in quality, and near or below the average total value of a bale of hay, then raising hay should be considered for the operation. Often, the maintenance and fixed costs associated with hay equipment don't allow for a producer to have enough capital cost recovery while also increasing the cost per bale production of hay. It should be noted that this publication doesn't include every cost associated with producing hay because each operation is different. It only includes the cost of nutrient removal values and custom rate charges for mowing, raking and wrapping a bale of hay. Utilize this information as a starting point for making the decision.

## CONCLUSION

Many other factors should be analyzed when deciding to buy or raise hay. Besides the factors listed above in this publication, consider the availability of high-quality hay in the area and the challenge of finding hay in drought years. Producing hay on-farm is a challenge but reduces the dependence on others. While short-term events such as drought can lead to increased hay prices that make the decision seem more in favor of raising hay, the long-term investment costs of hay equipment can be profit-prohibitive. Instead of hay equipment, storage could be a possible solution to drought. That is, routinely buying hay during low prices and storing enough hay as backup for emergency uses. Additionally, if hay is not harvested, pastures can be used for stockpiling and overseeding annual forages, which would increase the forage supply and reduce the need for hay and possibly the operation's overall hay cost.

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