

# NC STATE UNIVERSITY

**Hay Harvest Costs, Small Square Bales:** Estimated annual revenue, operating cost, fixed cost and net returns per acre at one ton of dry matter per acre yield.

Budget 84-1  
6/1/2013

Description	Unit	Price	Quantity	Value	Comments
<b>Operating inputs</b>					
-Baling Twine	Ball	\$15.00	0.25	\$3.75	
-Other				0.00	
-Other:				0.00	
-Other:				0.00	
-Machinery Labor (From Table 2)				32.16	
-Other Labor	Hours	\$12.00	0.00	0.00	
-Machinery Fuel, Maint, Repairs (Table 2)	Acre			28.61	
-Annual Operating Capital <sup>a</sup>	\$	5.0%	26.88	1.34	
<b>Total Operating Costs</b>				<b>\$65.86</b>	
			<b>Amount</b>	<b>Value</b>	
<b>Fixed Costs</b>					
-Machinery Depreciation, Taxes, Insurance, and Interest (From Table 1)				33.51	
<b>Total Cost</b>				<b>\$99.37</b>	
	<b>Unit</b>	<b>Price<sup>b</sup></b>	<b>Quantity</b>	<b>Value</b>	
<b>Production</b>					
-Harvested as Hay, Dry Matter	Ton	\$0.00	1.00	0.00	
<b>Total Receipts</b>				<b>\$0.00</b>	
<b>RETURNS ABOVE TOTAL OPERATING COST</b>				<b>-\$65.86</b>	
<b>RETURNS ABOVE ALL SPECIFIED COSTS<sup>c</sup></b>				<b>-\$99.37</b>	

<sup>a</sup> Interest on operating expenses for an average of 5 months.

<sup>b</sup> Only include a price if hay is being made as a custom hay making enterprise.

<sup>c</sup> This is the cost of harvesting hay when producing hay for your own use.

## NOTES

Budget does not include cost of producing the hay crop.

Budget includes moving bales from the field to a storage site. Cost of storage is not included.

A yield per cutting of one ton of dry matter is equal to 1.18 tons of well cured hay at 85% dry matter (15% moisture).

Multiply the dry matter cost shown in this budget by the hay dry matter % to convert the DM cost to the cost of hay as made. E.g., \$97.06/DM ton X 0.85 = \$82.50/ton of hay as made.

Divide the sale price of hay as made by the dry matter % to convert this hay price to a price per ton of dry matter.

Budget prepared by:

J.T. Green, Jr., Crop Science Extension Specialist, NCSU (Retired).

G.A. Benson, Extension Economist, NCSU (Retired).

Hay Harvest Costs, Small Square Bales: Estimated annual revenue, operating cost, fixed cost and net returns per acre at one ton of dry matter per acre yield.

Budget 84-1  
6/1/2013

**Table 1. Initial investment in specialized equipment and annual ownership expenses**

Operation and Item	Life	Initial Cost	Salvage Value	Depreciation <sup>a</sup>	Interest <sup>b</sup>	Tax & Ins. <sup>c</sup>	Annual D.I.T.I.	Annual Use	D.I.T.I. per Hour	Acres per Hour	Expense per Acre <sup>d</sup>	Times Over <sup>e</sup>	Total Expense	
	Years	\$	\$	\$	\$	\$	\$	Hours	\$	No.	\$	No.	\$/Acre	
Rate Charged, percent =====>														
					5.00%			1.40%						
Mowing														
Tractor, HP=	55	10	23,150	7,177	1,597	758	212	2,568	500	5.14	4.1	1.25	1	1.25
+ Mower-Cond.		10	22,525	6,758	1,577	732	205	2,514	100	25.14	4.1	6.13	1	6.13
Raking, turning														
Tractor, HP=	35	10	19,075	5,913	1,316	625	175	2,116	500	4.23	4.1	1.03	2	2.06
+ Tedder/Rake		10	4,650	1,163	349	145	41	535	75	7.13	4.1	1.74	2	3.48
Baling														
Tractor, HP=	55	10	23,150	7,177	1,597	758	212	2,568	500	5.14	2.2	2.33	1	2.33
+ Square Baler		8	23,515	6,584	2,116	752	211	3,080	125	24.64	2.2	11.20	1	11.20
Move & Stack														
Tractor, HP=	55	10	23,150	7,177	1,597	758	212	2,568	500	5.14	2	2.57	1	2.57
+ Bale Wagon		10	2,475	619	186	77	22	285	100	2.85	2	1.42	1	1.42
Bale elevator, gas		5	1,550	388	58	48	14	120	100	1.20	4.1	0.29	1	0.29
Other														
Tractor	55	10	23,150	7,177	1,597	758	212	2,568	500	5.14	1	5.14	0	0.00
+ Equipment		10	0	0	0	0	0	0	0	0.00	1	0.00	0	0.00
Other														
Pickup Truck, 3/4 Ton		10	30,225	7,859	2,237	952	267	3,455	500	6.91	10	0.69	4	2.76
Other self-propelled		10	0	0	0	0	0	0	0	0.00	0	0.00	0	0.00
<b>TOTAL</b>													<b>\$33.51</b>	

<sup>a</sup> Depreciation = (Initial cost - Salvage value) / years of life

<sup>b</sup> Interest on investment = ((Initial cost + Salvage value) / 2) X interest rate

<sup>c</sup> Combined rate of property taxes and insurance premiums as a percentage of the average investment

<sup>d</sup> Per acre costs for self-propelled vehicles include an additional 10% allowance for travel time from farm to field

<sup>e</sup> Total number of trips across the field per year for this operation

**Table 2. Operating expense for forage machinery and equipment per hour and per acre**

Operation and Item	Repairs & Maint. <sup>a</sup>	Repairs & Maint.	Repairs & Maint. <sup>b</sup>	Fuel Use	Cost per Gal	Fuel & Lube <sup>c</sup>	Total Cost	Acres per Hour	Times Over	Equip. Op. Cost <sup>d</sup>	Labor Cost	Labor Cost <sup>e</sup>	Total Expense	
	%	\$/Year	\$/Hour	Gals/hr	\$	\$/Hour	\$/Hour	No.	No.	\$/Acre	\$/Hour	\$/Acre	\$/Acre	
Fuel cost per gallon & Labor cost per hour =====>														
					3.45					12.00				
Tractor, HP=	55	2%	463	0.93	2.42	3.45	9.60	10.53	4.1	1	2.82	12.00	3.37	6.19
+ Mower-Cond.		4%	901	9.01	0	0.00	0.00	9.01	4.1	1	2.42			2.42
Tractor, HP=	35	2%	382	0.76	1.54	3.45	6.11	6.87	4.1	2	3.69	12.00	6.73	10.42
+ Tedder/Rake		2%	93	1.24	0	0.00	0.00	1.24	4.1	2	0.67			0.67
Tractor, HP=	55	2%	463	0.93	2.42	3.45	9.60	10.53	2.2	1	5.26	12.00	6.27	11.54
+ Square Baler		2%	470	3.76	0	0.00	0.00	3.76	2.2	1	1.88			1.88
Tractor, HP=	55	2%	463	0.93	2.42	3.45	9.60	10.53	2.0	1	5.79	12.00	6.90	12.69
+ Bale Wagon		2%	50	0.50	0	0.00	0.00	0.50	2.0	1	0.27			0.27
Bale elevator, gas		5	16	0.16	0.22	0.00	0.00	0.16	4.1	1	0.04	12.00	3.37	3.41
Tractor	55	2%	463	0.93	2.42	3.45	9.60	10.53	1.0	0	0.00	12.00	0.00	0.00
+ Equipment		2%	0	0.00	0	0.00	0.00	0.00	1.0	0	0.00			0.00
Pickup Truck, 3/4 Ton		2%	605	1.21	3.00	3.45	11.90	13.11	10.0	4	5.77	12.00	5.52	11.29
Other self-propelled		2%	0	0.00	3.00	3.45	11.90	11.90	0.0	0	0.00	12.00	0.00	0.00
<b>TOTALS</b>										<b>\$28.61</b>	<b>\$32.16</b>	<b>\$60.77</b>		

<sup>a</sup> Repairs and maintenance costs are calculated as a % of the initial cost in Table 1. Percentages are higher for equipment bought used.

<sup>b</sup> Repairs and maintenance costs per hour based on annual use shown in Table 1.

<sup>c</sup> Total fuel cost plus lube costs estimated as 15% of the fuel cost.

<sup>d</sup> Per acre costs for tractors and other self-propelled equipment includes an additional 10% allowance for travel time from farm to field.

<sup>e</sup> Labor cost per acre includes an additional 15% allowance for travel time, setting up and finishing up.

**Table 3. Sensitivity Analysis**

This table shows the total cost per ton of dry matter harvested under various assumptions about costs and yield per cutting.

Specifically, the cost and yields shown in the enterprise budget on the first page are believed to be fairly representative of conditions in North Carolina.

However, there is a wide variation in conditions from one farm to another and costs and yields can vary from year to year.

The table shows the effects of yields and costs that are 10 percent higher or lower than the basic budget, singly and in combination.

AVERAGE TOTAL COST PER TON OF DRY MATTER HARVESTED

		YIELD		
		-10%	Base Budget	+10%
COST	-10%	\$99.37	\$89.43	\$81.30
	Base	\$110.41	\$99.37	\$90.34
	+10%	\$121.45	\$109.31	\$99.37