

FARM Assistance

Focus

*Agri*LIFE EXTENSION

Texas A&M System



Economic Impact of Beef Cattle Best Management Practices in South Texas: Purchasing vs. Producing Hay

Cody Ringer

Anthony Netardus

Mac Young

Joe Paschal

Steven Klose



FARM Assistance Focus 2009-10
November 2009

Department of Agricultural Economics
Texas AgriLife Extension Service
Texas A&M University System

farmassistance.tamu.edu



Feeding hay and protein supplementation such as range cubes directly increase operating costs and often have a major impact on the profitability and financial well being of a ranching business.

Feeding supplemental hay is a common practice for South Texas cow-calf operations. Overstocking as well as variations in rainfall and forage conditions often require feeding hay to maintain cattle numbers. Feeding hay and protein supplementation such as range cubes directly increase operating costs and often have a major impact on the profitability and financial well being of a ranching business. Wildlife management and off-farm income are often a necessity to support ranching operations. Prudent managers continually evaluate and implement management strategies to increase long-term profitability and equity growth.

“Best Management practices” describes a wide array of strategies to improve ranching profitability and livestock performance. These strategies may include adjusting stocking rates, BSE testing, pregnancy testing, culling open cows, and purchasing vs. producing hay. This study evaluates the financial implications of purchasing vs. producing hay.

Assumptions

The Financial And Risk Management (FARM) Assistance strategic planning model was used to illustrate the individual financial impacts of buying vs. raising hay for South Texas ranchers. The 2,000-acre ranch in this model is assumed to consist of 1,900 acres of native pasture and 100 acres of previously established Coastal Bermuda. Five scenarios are evaluated: 1) buy all hay (250 cows and 10 bulls or 1 animal unit to 8-acre stocking rate); 2) grow and harvest hay own baling equipment; 3) grow hay and have it custom cut; 4) buy all hay and reduce stocking rate; and 5) grow hay, custom cut, and reduce stocking rate. In scenario 1, the high stocking rate (1 animal unit to 8 acres) assumes that 50 additional cows can be grazed on the 100 acres

of un-harvested Coastal. The last four scenarios assume 200 cows and 8 bulls (1 animal unit to 10 acres stocking rate).

The general assumptions are given in Table 1. Production inputs, yields, cost, and estimates for overhead charges were based on typical rates for the region. In 2009, the income from hunting was \$7/acre. The assets, debts, machinery inventory, and scheduled equipment replacements for the projection period were the same in all management scenarios. It is assumed the ranch has only intermediate term debt. Cattle prices used were from the Live Oak Livestock Commission Company auction report in Three Rivers, Texas, for May 4, 2009. A typical commercial cattle ranch was assumed to incorporate annual BSE for bulls and pregnancy testing for cows with a 95% calving rate.

The first scenario assumes all hay is purchased and the 100 acres of improved pasture is used for grazing only. This pasture is fertilized once a year to provide the Coastal Bermuda grass key nutrients for quality grazing forage. The fertilizer applied is 250 lbs/acre of 27-4-9 at \$50/acre (on the recommendation of a soil test). A one time application of a broad leaf herbicide at \$8/acre is also included.

In scenario 2, the improved pasture is used to produce hay that will be harvested by the rancher. The hay harvesting equipment is owned: tractor (\$36,000), baler (\$18,000), rake (\$5,000), cutter (\$10,000), and hay fork (\$100). The 100 acres of coastal Bermuda is harvested three times a year, and yield is 2.5 bales/acre for each cutting or 750 bales/year (1,200 lb. bales). The field is also fertilized three times at \$150/acre or \$15,000/year. A one time herbicide application at \$8/acre is also assumed. Part time labor was increased \$1,800 (\$10/hour times

10 hours/day times 3 days for cutting, raking, and baling, plus 3 more days for moving hay from the field). Fuel and lube for hay baling added \$4,692 to expenses (65 gallons of fuel/day times 3 days of cutting, raking and baling times \$2.30 per gallon plus 10 gallons/day times three days for moving hay). Net wrap was used to bale hay at \$1.12 per bale or \$1,140/

Table 1: 2009 General Assumptions, South Texas Representative Ranch

Selected Parameter	Assumptions
Operator Off-Farm Income	\$24,000/yr
Spouse Off-Farm Income	\$35,000/yr
Family Living Expense	\$30,000/yr
Native Pasture	1,900 acres
Improved Pasture (Bermuda)	100 acres
Ownership Tenure	100%
Royalty Income	Not Included
Hunting Income	\$7/acre
Herbicide Costs/Acre	\$1.50
Fertilizer Cost/Acre	\$50.00
Cow Herd Replacement	Bred cows
Vet, Medicine & Supplies	\$25/cow
Salt/Mineral blocks/Year	\$20/cow
Hay Fed/Cow/Year	1.5 tons
Protein Cubes Fed/Cow/Yr	150 lbs.
Cow Culling Rate/Yr	7.5%
Calving Rate	95%
Steer Weaning Weights	525 lbs.
Heifer Weaning Weights	475 lbs.
Steer Prices	\$1.08/lb.
Heifer Prices	\$.98/lb.
Cull Cow Prices	\$.50/lb.
Cull Bull Price	\$.62lb.
Bred Cow Price	\$1,100/head
Replacement Bull Prices	\$2,300/head
Hay Prices	\$75/ton
Range Cube Prices	\$0.18/lb.
Pregnancy Testing	\$6.50/cow
Bull Testing	\$57.63/bull
Soil Testing	\$10/yr
Custom Hay Cutting	\$25/bale

year. Maintenance and repairs was estimated at \$1/bale. It is assumed that the producer does not custom cut hay outside of his operation.

The third scenario involves hay production with custom harvesting at \$25/bale or \$18,750/year. Fuel for moving hay bales off the field amounted to \$207/year (10 gallons/day times three days times \$2.30 per gallon times 3 cuttings). Additional labor for moving hay from the field was estimated to be \$900/year (\$10/hour times 10 hours/day times 3 days at 3 cuttings/year).

Scenario 4 is comparable to scenario 1 and entails buying hay but not fertilizing the 100 acres of Coastal Bermuda. A one time application of a broad leaf herbicide on the Coastal Bermuda at \$8/acre was assumed.

The fifth scenario is similar to scenario 3. Hay is harvested only one time and then cattle are grazed on the Coastal Bermuda field. Changes to annual operating costs include: \$6,250 for custom hay harvesting; \$69 for fuel; \$300 in labor for moving the hay from the field; \$5,000 for fertilizer; and herbicide at \$800.

The base year for the 10-year analysis of the representative ranch is 2009 and projections are carried through 2018. Commodity and livestock price trends follow projections provided by the Food and Agricultural Policy Research Institute (FAPRI, University of Missouri) with costs adjusted for inflation over the planning horizon. Representative measures, including profitability and liquidity were chosen to assess the financial implications of each scenario. Profitability measures

the extent to which a farm or ranch generates income from the use of its resources. Net cash farm income (NCFI) is one measure of profitability. Liquidity measures the ability of a farm or ranch to meet its short-term financial obligations without disrupting the normal operations of the business. The liquidity of the operation may be measured by the ending cash balance. Each measure provides information with respect to the projected variability in the ranch's financial position and performance. When taken as a whole, the analysis provides insight into the risk and return expectations of the ranch throughout the planning horizon under each management practice.

Results

Comprehensive financial projections, including price, weaning weight and hay production risks, are illustrated in Table 2 and Figures 1, 2, and 3. Table 2 presents the average outcomes for selected financial projections, while the graphical presentations illustrate the range of possibilities for the selected variable.

Net cash farm income (NCFI) is slightly higher for Scenario 2 (own

equipment) compared where all hay is purchased in Scenario 1. However, there is very little difference. Average NCFI per year is \$44,620 in Scenario 2 and \$43,410 in Scenario 1 (Table 2 and Figures 1 and 2). Adjusting NCFI for depreciation, net farm income per year is \$42,720 in Scenario 1 and \$38,640 in Scenario 2. Over the 10-year forecast, buying hay appears to be the best alternative on average. Cumulative 10-year cash flow is \$530,260 for buying hay (Scenario 1) and \$487,820 for producing hay and harvesting it with your own equipment (Scenario 2). The difference is largely due to the additional cost of owning

Table 2: Financial Indicators for a South Texas Representative Ranch

Scenario	Number of Cows	10-Year Averages				Cumulative 10-Yr Cash Flow/Cow (\$1000)
		Total Cash Receipts (\$1000)	Total Cash Costs (\$1000)	Net Cash Farm Income (\$1000)	Net Farm Income	
1-Buy Hay	250	174.36	130.95	43.41	42.72	530.26
2-Own Equipment (3 cuts)	200	157.86	113.24	44.62	38.64	487.82
3-Custom Cutting (3 cuts)	200	157.86	128.21	29.65	29.67	432.74
4-Buy Hay	200	143.01	107.70	35.31	35.33	471.11
5-Custom Cutting (1 cut)	200	142.98	109.60	33.37	33.39	458.44

Figure 1: Projected Variability in Net Cash Farm Income For Buying Hay

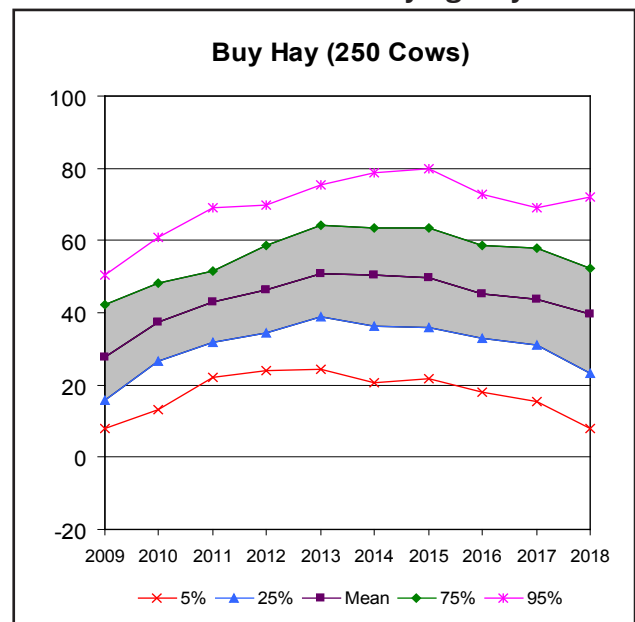


Figure 2: Projected Variability in Net Cash Farm Income for Owning Hay Equipment

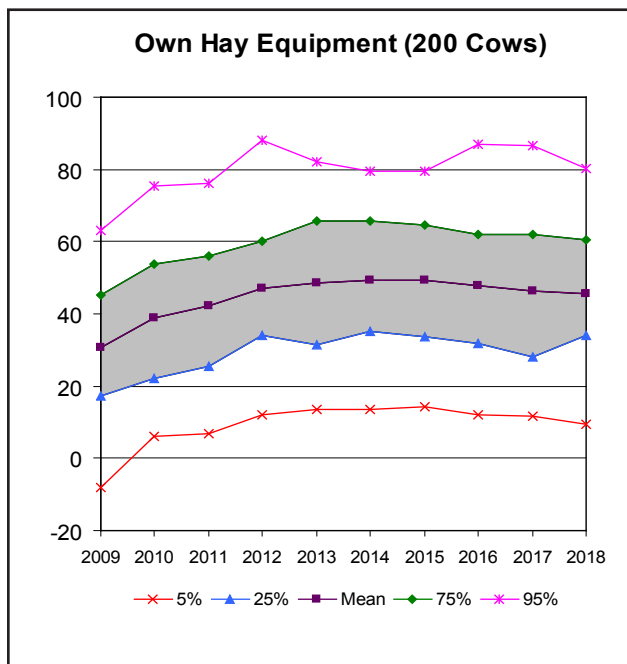
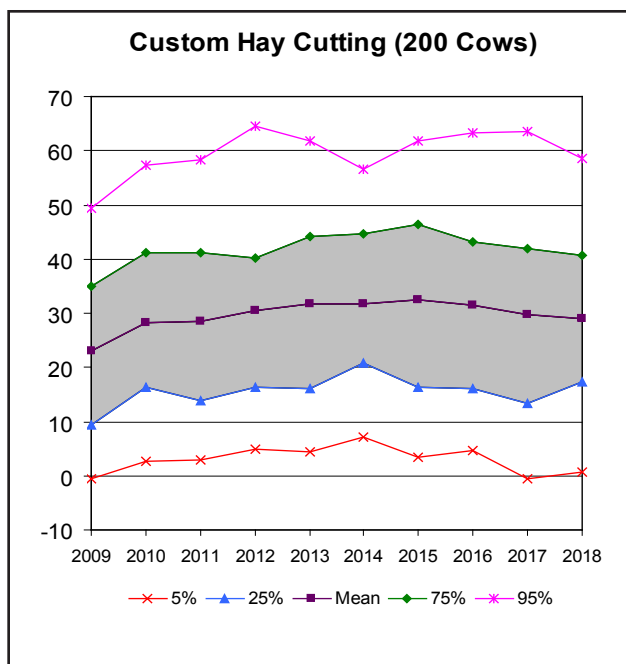


Figure 3: Projected Variability in Net Cash Farm Income for Custom Hay Cutting



harvest equipment. It is possible that owning your hay harvest equipment could be the best alternative if a producer increased NCFI by custom harvesting for other producers or if equipment costs were lower than assumed.

In Scenario 3, producing hay and having it custom harvested appears to be the least profitable (Table 2 and Figure 3). Average NCFI per year is projected to be \$29,650, 33.5% less than owning hay equipment and 31.7% less than buying hay. Cumulative 10-year cash flow is the lowest of all scenarios.

The less-intensive management alternatives in Scenarios 4 and 5 are more profitable than custom cutting but less profitable than Scenarios 1 and 2. Average NCFI in scenarios 4

and 5 are \$35,310 and \$33,370 per year, respectively.

Implications

Off-farm income, hunting, and other sources of income for a typical South Texas cow-calf operation often enhance overall financial performance and condition. Implementing the most cost-effective supplemental hay strategies offer cow-calf producers the potential to improve profitability. The actual results of this illustration will likely vary by producer, management practices, type and age of equipment, and method of supplying supplemental hay.

Buying hay may prove to be more beneficial to producers in an average year. Producing hay and owning the baling equipment appears to be

more profitable than custom cutting. However, if a producer who owns haying equipment custom cuts hay for others, net income could be supplemented and owning equipment could be a better alternative than buying hay. A judicious manager will evaluate and implement the best operational strategies that benefit the overall financial performance of the ranch and minimize overall risk.

Acknowledgements

Appreciation is expressed to Randel Matheson, Kody Franke, and Bill Braden for their input and advisory contributions to this project.

Produced by FARM Assistance, Texas AgriLife Extension Service,
The Texas A&M University System

Visit Texas AgriLife Extension Service at: <http://texasagrilife.tamu.edu>

Education programs conducted by The Texas AgriLife Extension Service serve people of all ages regardless of socioeconomic level, race, color, sex, religion, handicap or national origin.