FARM Assistance Focus

Texas A&M AgriLife Extension

Profitability of Beef Cattle Best Management Practices in South Texas: Grazing Leases

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Many cow-calf producers are asking, "What can I afford to pay for grass with today's market conditions?"

Record cattle prices and improved forage conditions across South Texas in 2014-2015 have many cow-calf producers asking, "what can I afford to pay for grass with today's market conditions?" Potential higher profits drive increased optimism, but directly the determination of what a producer can pay for a lease is linked to the carrying capacity of the leased land. Carrying capacity is the number of animal units (usually a 1,000 lb. cow with or without a weaned calf is defined as "animal unit") that a piece of land can support sustainably for a year. Carrying capacity can be calculated by estimating how much forage is produced (on average) in a year, accounting for brush, water ways, roads, etc., reducing it by 50% or more to sustain plant viability for regrowth and then dividing the remainder by 9,490 lbs., the amount an animal unit will consume in a year. The result is the number of animal units that can be stocked on that property. Stocking rate is the number of acres that an animal unit has to graze for a specific period of time. Successful managers will closely evaluate costs relative to carrying capacity of grazing land to determine their bottom line profit and risk exposure.

"Best management practices" such as pregnancy testing, bull breeding soundness examinations and vaccinations for reproductive diseases are proven strategies in improving herd performance and ranching profitability. And, the capital or investment cost of replacements to expand herd size significantly impacts returns. However, the cost of grazing leases or land cost based on carrying capacity can be a limiting factor in marginal areas where the number of acres to support an animal unit is high. Lease rates vary across South Texas based on normal forage conditions and averages from $165 per animal unit in the brush country to $200 per animal unit in the Lower Rio Grande Valley (Texas 2013). This study illustrates the financial implications of grazing lease rates and stocking rates on the profitability of South Texas ranching operations.

Assumptions

The Financial And Risk Management (FARM) Assistance strategic planning model was used to illustrate the individual financial impacts of stocking rates and grazing leases on South Texas ranchers. Forty-two scenarios were evaluated based on 7 carrying capacities ranging from 1 cow to 5 acres (1:5) to 1 cow to 35 acres (1:35) and 6 grazing lease rates per acre (ranging in $5 increments to $35). It was assumed that each stocking rate level reflected the amount of forage available in a normal year.

The 2,000-acre ranch in this model consists of 1,800 acres of native pasture and 200 acres of established Coastal Bermuda used for grazing only. It is assumed the native pasture was harvested to a level of 50% and the Coastal Bermuda was harvest to 75%, so as not to affect the plant and to optimize grazing. Higher stocking rates (and subsequently carrying capacities) represent higher rainfall regions of the state similar to those found along the Gulf Coast or East Texas. Lower stocking rates (and carrying capacities) represent lower rainfall regions of the state similar to those found in the southwest and west. The lowest and highest lease rates assigned to various capacities are likely not feasible but are included for completeness. Regardless of the rainfall, the ranch was 90% native and 10% introduced grass, which was a principle determinant of carrying capacity and subsequent stocking rate.

The number of cows and bulls in each stocking rate scenario is given in Table 1. Since the number of cows (carrying capacity) varied under each scenario, the number of bulls was changed as needed, but capacities are stated in cows only. Under each stocking scenario, the number of cows per acre is based on assumed forage availability (i.e., 1:5 assumes 1 cow or animal unit per 5 acres). The number of bulls equates to 1:25 cows. A basic assumption is that the operation is not overstocked at each stocking rate scenario.

Table 1: Specific Assumptions for a South Texas Representative Ranch

Stocking Rate (Cows to Acres)	Number of Cows	Number of Bulls
1:5	400	16
1:10	200	8
1:15	134	6
1:20	100	4
1:25	80	3
1:30	67	3
1:35	57	2

Production inputs, yields, costs, and estimates for overhead charges were based on typical rates for the region. In reality, overhead costs could be adjusted to improve profitability at lower stocking rates. Whereas this illustration is a comparison of returns per cow from only the cattle operation, off-farm income, hunting, and royalty income are excluded from the analysis. It is also assumed the ranch has no debt. Cattle prices used were from the Live Oak Livestock Commission Company auction report in Three Rivers, Texas, for April 13, 2015.

Calving rates and death loss assumptions in the scenarios were based on research conducted by Texas A&M AgriLife Research and Extension Service. The operation pregnancy tests cows, BSE tests bulls, performs clostridial and reproductive vaccinations, castrates bull calves, uses growth implants, and deworms.

The base year for the 10-year analysis of the representative ranch is 2015 and projections are carried through 2024. The projections for 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. Pre-tax profitability was the measure 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) was used to measure profitability. It includes the purchase and sale of breeding livestock, but does not include non-cash items such as depreciation. NCFI provides information with respect to the projected variability in the ranch's profitability expectations throughout the 10-year planning horizon under each stocking/lease rate scenario.

Results

Estimated 10-year average net cash farm income (NCFI) projections for each stocking and lease rate scenario are given in Table 3. These results represent the average outcomes for net cash farm income projections for 2015-2024. Results are most appropriately interpreted as the impact of varying lease rates at a given stocking rate (comparing across a single row of Table 3). Comparing results of different stocking rates at a specific lease rate (down a column) is less relevant because the overhead cost structure is assumed constant at all herd sizes.

The multiple stocking rate - lease rate combinations result in a wide range of potential profitability. As noted previously the lowest and the highest values for all the stocking rates (shaded) are not practical, suggesting a need at the extremes to adjust the management/cost structure from the typical structure assumed in the analysis. The most likely lease prices (acceptable to both parties) for each stocking rate are in the middle range of the NCFI values (not shaded). This analysis does not imply that a stocking rate is only worth a lease rate

Table 2: 2015 General Assumptions, South Texas Representative Ranch

Selected Parameter	Assumptions
Operator Off-Farm Income	Not Included
Spouse Off-Farm Income	Not Included
Family Living Expense	Not Included
Native Pasture	1,800 acres
Improved Pasture (Bermuda)	200 acres
Ownership Tenure	100%
Royalty Income	Not Included
Hunting Income	Not Included
Herbicide/Acre (Native Pasture)	$0.90
Herbicide/Acre (Bermuda)	$12.00
Fertilizer/Acre (Bermuda only)	$30.00
Cow Herd Replacement	Bred cows
Vet, Medicine & Supplies	$34.34/cow
Salt/Mineral blocks/Year	$23.60/cow
Hay Fed/Cow/Year	1.5 tons
Protein Cubes Fed/Cow/Year	200 lbs.
Calving Rate	90%
Cow Culling Rate/Year	10%
Steer Weaning Weights	525 lbs.
Heifer Weaning Weights	475 lbs.
Steer Prices	$2.58/lb.
Heifer Prices	$2.34/lb.
Cull Cow Prices	$1.14/lb.
Cull Bull Prices	$1.34/lb.
Bred Cow Prices	$2,000/head
Replacement Bull Prices	$4,500/head
Hay Prices	$100/ton
Bulk Range Cube Prices	$.15/lb.
Pregnancy Testing	$7.50/cow
BSE Testing	$42.50/bull
Clostridial Vaccination	$1.16/calf
Castration & Growth Implants	$1.97/calf
Deworming Injection (Cow/Calf)	$1.81/$3.96
Reproductive Vaccines	$3.12/cow
Extra Day Labor/Calf Practice	$2/calf

The current high cattle prices do not necessarily translate into profitable stocking scenarios at high lease rates per acre.

Table 3: 10 -Year Average Net Cash Farm Income Per Cow for South Texas Representative Ranch ($)

Stocking Rate (Cows to Acres)	Grazing Lease Rates Per Acre					
	$5	$10	$15	$20	$25	$30
1:5	407.10	382.10	357.10	332.10	307.10	282.10
1:10	293.20	243.00	193.15	143.15	93.15	42.70
1:15	173.88	102.76	27.46	-58.51	-158.73	-264.55
1:20	51.30	-59.90	-195.90	-339.00	-483.50	-628.30
1:25	-60.00	-230.25	-409.75	-590.63	NA	NA
1:30	-215.67	-429.85	-654.82	NA	NA	NA
1:35	-392.28	-645.96	NA	NA	NA	NA

that generates a positive NCFI. Other factors or amenities such as facilities, fencing, water, and even hunting rights can greatly impact lease value.

The current high cattle prices do not necessarily translate into profitable stocking scenarios at high lease rates per acre. At a 1-to-15 stocking rate with a $15/acre lease rate, the average NFCI is $27.46/cow/year. A lease rate of $20 or more would likely generate a loss.

Higher stocking rate scenarios (1-to-5 and 1-to-10) are less sensitive to changing lease rates. Lower stocking rates are highly sensitive to incremental changes in lease rates because there are fewer cows to spread the overhead lease costs.

Implications

High market prices increase the potential for net profits, but also increases financial risk exposure in cattle operations. Normally off-farm income, hunting, and other income sources help mitigate the higher level of financial risk. However, without other sources of income, the potential for higher profits appears to be the best in situations where normal forage conditions can justify running more cattle.

While the actual results are comparable to the 2013 Texas Rural Land Value Trends, this study should not be construed as justification by landowners to raise rates, or producers to overstock or bid up lease rates. Cattle markets and forage conditions can vary significantly from year to year. A longer-term perspective is likely warranted.

These results should only serve as a guideline as they will likely vary by producer, grazing conditions, and cattle markets. Debt obligations for operating, cattle purchases and capital purchases will also be a major factor in determining what a producer can pay for grazing and effect bottom-line profits. Landowners and cow-calf producers should closely evaluate their individual stocking and lease rate scenarios using their expected prices and costs to determine the best available option for their operation. The FARM Assistance program is an excellent resource to help individuals evaluate the long-term financial implications of their own unique situation, cost structure, and leasing opportunities.

References

Texas Rural Land Value Trends 2013. Texas Chapter of the American Society of Farm Managers & Rural Appraisers. Junction, TX. June 2014.

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