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Economic Impact of Beef Cattle Best Management Practices in South Texas: Stocking Strategies During Drought

Mac Young

Megan Dominguez

Joe Paschal

Steven Klose



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

farmassistance.tamu.edu

Successful managers need to evaluate and implement cost-effective strategies to sustain operations and minimize losses during drought-stricken years.

Cow-calf producers in South Texas have had to make tough management decisions due to the prolonged drought. It became apparent 2011 would be a dry year, but predictions of the drought prolonging into 2012 raise significant concerns for the producers' bottom-line impact. Management decisions often revolve around feeding vs. destocking herds. Reduced forage and hay availability, along with escalating hay and high cattle prices complicate the decision making process.

Successful managers need to evaluate and implement cost-effective strategies to sustain operations and minimize losses during drought-stricken years. To accomplish this, producers must identify their "best management practices" or strategies to improve or sustain herd performance and ranching profitability. These may include reducing stocking rate, culling older or low performing cows, supplemental feeding, and calf management practices.

Monitoring forage conditions and adjusting stocking rates accordingly vs. feeding are key decisions affecting the financial impact of drought periods (White and Troxel 1995, Hart and Carpenter 1999, and Hart 2000). Destocking livestock during periods of reduced forage availability and slowly restocking after forage conditions improve is an economically viable way to control feed costs and operational losses (Carpenter and Hart 1999). This paper illustrates a case study demonstrating financial implications of selected destocking and restocking strategies to optimize the profitability of South Texas ranching operations in drought conditions.

Assumptions

The Financial And Risk Management (FARM) Assistance strategic planning model was used to illustrate the individual financial impacts of stocking and feeding practices by South Texas ranchers. Five scenarios were evaluated: 1) no destocking in year one; 2) destock 50% (calves, cull cows and replacements) in the first 3 months of year one; restock 100% by the third year; 3) destock 50% in first 3 months and 25% more by 6 months in the first year; restock 100% by the third year; 4) destock 50% in the first 3 months, 25% more by 6 months and all cattle by 9 months of the first year; restock

100% by the third year; and 5) destock 50% in first 3 months, 25% more by 6 months and all cattle by 9 months of the first year; restock to only 75% by the third year.

The 2,000-acre ranch in this model consists of 1,800 acres of native pasture and 200 acres of established Coastal Bermuda grass used for grazing. The cow herd includes 200 cows (1 animal unit to 10 acres) and 8 bulls (1 bull to 25 cows). 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 2011, the income from hunting was \$10/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 August 29, 2011.

Specific hay and protein feeding assumptions were made in each scenario (Table 2). The ranch pregnancy tests cows, BSE tests bulls, and has an 85% calving rate. Calf sizes and death loss assumptions in the scenarios were based on research conducted by Texas AgriLife Research and Texas AgriLife Extension Service.

The first scenario assumes the ranch does not destock and supplemental feeds with hay and range cubes year round to compensate for depleted forage. Steer and heifer weaning weights were assumed to be 550 lbs. and 500 lbs., respectively. Calf prices in 2011 were \$1.30/lb and \$1.20/lb for large and medium frame, muscle score 2, steers and heifers, respectively. Maintaining the herd size requires a full feeding regime during 2011-2013 as forage conditions fully recover (Table 2).

In Scenarios 2-5, use of supplemental hay and range cubes required to sustain the herd are reduced due to destocking (Table 2). All of these scenarios assume early weaning of calves (steers 275 lbs. and heifers 250 lbs.) in 2011. Average prices in 2011 for early weaned calves were \$1.60/lb. for steers and \$1.40/lb. for heifers. In years 2012-2020,

weaning weights were assumed to be 550 lbs. and 500 lbs., respectively. It was assumed that the operation would restock to 100 cows in 2012 and 200 cows in 2013 in Scenarios 2-4. In Scenario 5, cows were restocked to 75 in 2012 and 150 in 2013.

The base year for the 10-year analysis of the representative ranch is 2011 and projections are carried through 2020. The projections for commodity and livestock price trends were provided by the Food and Agricultural

Table 1: 2011 General Assumptions, South Texas Representative Ranch

Selected Parameter	Assumptions
Operator Off-Farm Income	\$24,000/year
Spouse Off-Farm Income	\$35,000/year
Family Living Expense	\$30,000/year
Native Pasture	1,800 acres
Improved Pasture (Bermuda)	200 acres
Ownership Tenure	100%
Royalty Income	Not included
Hunting Income	\$10/acre
Herbicide/Acre (Bermuda only)	\$2.50
Fertilizer/Acre (Bermuda only)	\$18.00
Herd Size (Initial)	200 Cows, 8 Bulls
Cow Herd Replacement	Bred cows
Vet, Medicine & Supplies	\$25/cow
Salt/Mineral blocks/Year	\$26/cow
Calving Rate	85%
Cow Culling Rate/Year	7.50%
Steer Weaning Weights	275 lbs.; 550 lbs.
Heifer Weaning Weights	250 lbs.; 500 lbs.
Steer Prices (275 wt.; 550 wt.)	\$1.60/lb.; \$1.30/lb.
Heifer Prices (250 wt.; 500 wt.)	\$1.40/lb.; \$1.20/lb.
Cull Cow Prices	\$.50/lb.
Cull Bull Prices	\$.70/lb.
Bred Cow Prices	\$1,400/head
Replacement Bull Prices	\$2,500/head
Hay Prices (2011, 2012, 2013)	\$150/ton; \$120/ton; \$85/ton
Range Cube Prices	\$.18/lb.
Pregnancy Testing	\$6.50/cow
Bull Testing	\$57.63/bull

Table 2: Specific Feeding Assumptions, South Texas Representative Ranch (200 Cows)

2011 Destocking & 2012-2013 Restocking Scenarios	Hay (Tons/Cow)				Range Cubes (Tons/Cow)			
	2011	2012	2013	2014-2020	2011	2012	2013	2014-2020
1-No Destocking	3.650	3.650	3.650	0.910	0.730	0.730	0.730	0.182
2-Destock 50%; Restock 100%	2.280	1.820	1.820	0.910	0.456	0.364	0.364	0.182
3-Destock 75%; Restock 100%	1.823	0.910	0.910	0.910	0.365	0.182	0.182	0.182
4-Destock 100%; Restock 100%	1.593	0.910	0.910	0.910	0.319	0.182	0.182	0.182
5-Destock 100%; Restock 75%	1.593	0.300	0.300	0.300	0.319	0.060	0.060	0.060

Policy Research Institute (FAPRI, University of Missouri) with costs adjusted for inflation. 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) includes the purchase/sale of breeding livestock, but does not include non-cash expenses such as depreciation. Net Farm Income, considered a more accurate measure of profitability, includes non-cash expenses, but does not count the longer term capital purchase/sale of breeding livestock. 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 which is net of taxes. 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 10-year planning horizon under each management practice.

Results

Comprehensive financial projections for each management scenario are illustrated in Table

3. This table represents the average outcomes for net cash farm income, cash flow and other selected financial projections during the 10 years (2011-2020). Additionally, Figures 1 and 2 graphically illustrates the range of possible variation in Net Farm Income and Ending Cash Balances for the 5 scenarios.

All evaluated destocking and restocking management practices (Scenarios 2-5) offer the potential to significantly improve bottom line profits in a drought situation as compared to no destocking (Table 3).

With no destocking (Scenario 1), the 10-year average net cash farm income (NCFI) is \$15,310/year. The operation begins the first year of each scenario with a cash balance of \$10,000, and if profitable, accumulates cash over the 10-year period. Cumulative cash reserves, at the end of the 10-year projections for Scenario 1 is \$327,280. Real Net Worth for the operation is projected to see a cumulative 12.1% growth over the 10-year period. It is worth noting that off-farm income and hunting contributes substantially to the cash flow of the ranching business; however, this effect is present in all scenarios.

Each of the destocking scenarios represents an improvement in profitability, cash flow, and equity growth relative to no destocking in Scenario 1. NCFI potentially improves from

\$10,000 to \$15,000 over Scenario 1. Scenario 5 (destocking 100%, but only restocking to 75%) offers the greatest potential for NCFI with a \$30,070 average. In this scenario the supplemental feed costs savings slightly outweigh the loss in production capacity from permanently limiting the herd size to 75% of Scenario 1.

Figure 1 illustrates the Net Farm Income (NFI) for the five scenarios. In 2011 and 2012 the highest profit performance comes from scenarios that destock the most and save the most feed expense. NFI will also be higher in a destocking situation because the sale of breeding livestock will create net income, especially when selling older animals that have been fully depreciated. Moving well into the recovery period, the order of NFI performance flips in 2014. By this time the Scenario 1 produces the highest profit. Most of the difference in 2014-2018 has to do with depreciation. In the recovery period the scenarios that are restocking cows will experience higher non-cash expense of depreciation from newly purchased cows, lowering NFI. In addition, the annual culling of cows will also produce more net income for those that held onto livestock through the drought because the culled animals will have little depreciable basis remaining. The NFI profit measure converges for all 5 scenarios as this depreciation difference is diminished over

Table 3: 10-Year Average Financial Indicators for a South Texas Representative Ranch (200 Cows)

2011 Destocking & 2012-2013 Restocking	10-Year Averages (2011-2020)			Cumulative	
	Total Cash Receipts	Total Cash Costs	Net Cash Farm Income	Ending Cash Balance 2020	Change in Real Net Worth
1-No Destocking	\$173,880	\$158,560	\$15,310	\$327,280	12.1%
2-Destock 50%; Restock 100%	\$166,770	\$141,250	\$25,520	\$427,440	14.5%
3-Destock 75%; Restock 100%	\$169,100	\$140,960	\$28,140	\$455,090	15.3%
4-Destock 100%; Restock 100%	\$172,090	\$145,930	\$26,170	\$437,150	14.8%
5-Destock 100%; Restock 75%	\$143,190	\$113,120	\$30,070	\$473,290	14.5%

A judicious manager will evaluate and implement the best stocking strategy in a drought to improve the overall financial performance of the ranch and minimize overall risk.

Figure 1. Net Farm Income

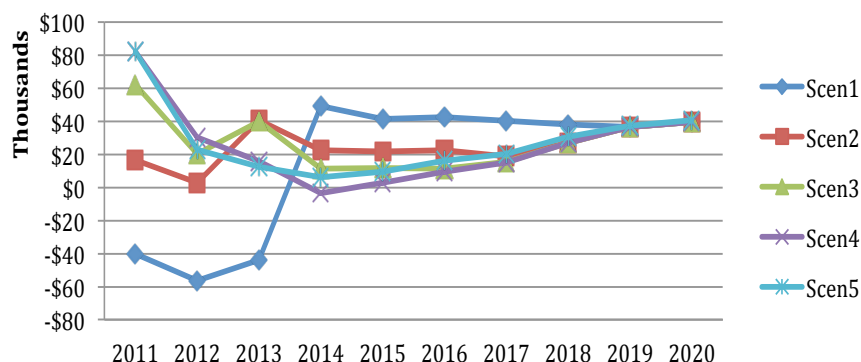
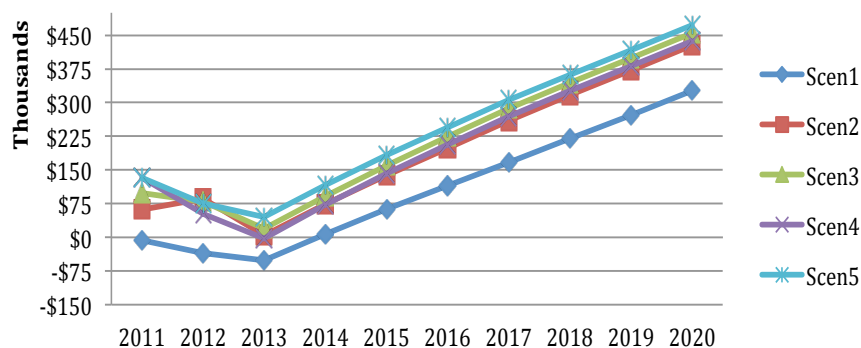


Figure 2. Ending Cash Balance



6-7 years of culling/replacing the herd.

Scenario 5 projects the highest average ending cash balance with \$473,290. However, a significant portion of the additional cash on hand is a result of not purchasing 50 cows compared to the other four scenarios. While Scenario 5 carries a higher cash asset balance, the other scenarios carry more assets in cattle inventory. The critical result, however, is that each of the destocking scenarios has a better cash flow in comparison to maintaining the herd size and feeding through the drought. Figure 2 illustrates the pattern of annual cash flow for each scenario. Clearly from this picture, Scenario 1 would have the most

troublesome cash flow situation, with a negative cash position through the first three years that prevents Scenario 1 from ever catching up to the performance of the destocking scenarios.

While Scenario 5 has the best cash flow and highest average profit, Scenario 3 actually produces the higher Real Net Worth by the end of the 10-year projection period. The asset value of a larger herd helps push Scenario 3 equity to a 15.3% growth. The other destocking scenarios experience slightly less growth, but still significantly more than no destocking. While the financial projections presented here seem to

slightly favor Scenario 3 and 5, one must consider that a lighter stocking rate (Scenario 5) would put the ranch in a better position to withstand the effects of future drought and limited forage conditions that were not included in the analysis.

Implications

The financial performance and condition of a typical South Texas cow-calf operation is normally supported by some off-farm income, hunting, and other sources of income. However, stocking strategies in a drought can have a significant impact on near-term and long-term profitability and performance. Destocking, compared to maintenance feeding during a prolonged drought, offers cow-calf producers the potential to minimize losses. Restocking the ranch and maintaining herd size at a lower stocking rate (Scenario 5) may stretch forage availability further throughout the year. In addition, it will improve overall profitability by reducing long term feed and cattle purchasing costs.

Actual results will vary by producer, management practices, and cattle markets, but this example ranch is provided to show the bottom-line impacts for a reasonable set of assumptions. A judicious manager will evaluate and implement the best stocking strategy in a drought to improve the overall financial performance of the ranch and minimize overall risk.

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