FARM Assistance Focus

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Long Term Financial Impacts of Drought Management Strategies

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Livestock ranches and cattlemen in [South Texas] have responded by implementing different management strategies to reduce the effects of low rainfall totals and loss in forage production.

Many South Texas counties have been adversely affected by drought situations since November 2005. Livestock ranches and cattlemen in this area have responded by implementing different management strategies to reduce the effects of low rainfall totals and loss in forage production. To offset the loss in forage during a drought, supplemental feeding is generally increased as well as the culling of cow herds at heavier than normal rates. Since hay shortages have been felt across all of Texas during the 2005-2006 growing season, cattlemen have seen a substantial increase in supplemental feeding expenses. Coupled with culling and herd replacement costs after a drought, livestock ranches are seeing how these management strategies impact their financial well-being.

Assumptions

The Financial And Risk Management (FARM) Assistance financial planning model was used to evaluate and illustrate the individual financial impacts of a prolonged drought on a representative (hypothetical) commercial cow-calf ranching business in South Texas. This study looked at two scenarios commonly utilized during drought situations; purchase feed to keep herd size numbers the same (Scenario 1) and sell cows to reduce herd size by 20% (Scenario 2). The representative ranch chosen was a 2,000 acre ranch located in DeWitt County with the basic assumptions and characteristics given in Table 1. Production costs and estimates for overhead charges were based on typical rates for the region. Cattle prices were obtained from a representative south-central Texas livestock commission report for March 10, 2006. A similar study was conducted by Young, Paschal, Hanselka, Klose, & Jupe (2006) which compared a representative ranch in South Texas during normal rainfall and extended drought situations. In that study, the authors found that in the two-year drought scenario, the profitability of the ranch was severely impacted over the ten year planning horizon. In our study, both scenarios are exposed to the same drought conditions, only management strategies are different.

The representative ranch was analyzed over a 10-year period. In scenario 1 where the cow herd size remained constant and additional feed (hay & supplement) was purchased, a 10% replacement rate was used in each of the 10 years. The base year for the analysis is 2006 and projections are carried through 2015. The assets, debts, machinery complement, and scheduled equipment replacements for the projection period were the same in both of the scenarios. Long-term livestock price trends follow projections provided by the Food and Agricultural Policy Research Institute (FAPRI, University of

Table 1: Representative South Texas Ranch Assumptions

Selected Parameter	Purchase Feed-Maintain Cow Herd Size (Scenario 1)	Sell Cows to Reduce Herd Size (Scenario 2)
Operator Off-Farm Income	$24,000/year	Same
Spouse Off-Farm Income	$35,000/year	Same
Family Living Expense	$30,000	Same
Ownership Tenure	100%	Same
Debt Situation	Low	Same
Initial Herd Size	200 cows, 8 bulls	Same
Calf Weaning Rate	85%	Same
Herd Replacement	Bred Heifers	Same
Supplemental Feeding	Salt/Mineral Blocks	Same
Hay Fed/Cow/yrs 2006-2015	2006 -4.0 tons; 2007 - 2.5 tons; 2008-2015 - 1.2 tons	2006 - 3.5 tons; 2007 - 2.25 tons; 2008-2015 - 1.2 tons
Protein Cubes Fed/Cow/Year	2006 - 400 lbs; 2007 - 300 lbs; 2008 - 200 lbs	2006 - 360 lbs; 2007 - 300 lbs; 2008 - 200 lbs
Cow Culling Rate/Year	10%	20% in 2006; 1-% 2007-2015
Steer Weaning Rates	525 lbs	Same
Heifer Weaning Rates	475 lbs	Same
Steer Prices	$1.25/lb	Same
Heifer Prices	$1.18/lb	Same
Cull Cow Prices	$0.48/lb	Same
Cull Bull Prices	$0.48/lb	Same
Bred Heifer Prices	$855/head	Same
Replacement Bull Prices	$2,500/head	Same
Hay Prices	$135/ton - 2006, $110/ton - 2007, $85/ton - 2008-2016	Same
Range Cube Prices	$0.08/lb	Same

In the years required to rebuild the herd (2007-2010), the profitability advantage is in [maintaining the herd] where average NCFI is $14,497.50 compared to only $3,282.50 for [herd culling].

Table 2: Financial Projections - Selected Indicators

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
Total Cash Receipts ($1,000)											
Maintain Herd (Scenario 1)	129.02	122.09	114.56	108.94	104.45	101.17	99.32	100.44	103.15	105.43	108.86
Herd Culling (Scenario 2)	139.62	99.55	95.97	96.07	97.97	101.17	99.32	100.44	103.15	105.43	103.87
Total Cash Costs ($1,000)											
Maintain Herd (Scenario 1)	165.53	129.85	89.90	86.53	85.78	86.62	86.13	86.30	86.97	87.60	99.12
Herd Culling (Scenario 2)	134.45	109.20	86.99	87.91	92.33	86.62	86.13	86.30	86.97	87.60	94.45
Net Cash Farm Income ($1,000)											
Maintain Herd (Scenario 1)	-36.51	-7.76	24.67	22.41	18.67	14.56	13.19	14.14	16.18	17.83	9.74
Herd Culling (Scenario 2)	5.18	-9.64	8.98	8.16	5.63	14.56	13.19	14.14	16.18	17.83	9.42
Ending Cash Reserves ($1,000)											
Maintain Herd (Scenario 1)	-2.89	11.40	47.20	85.53	129.53	163.20	196.94	232.03	269.14	307.90	
Herd Culling (Scenario 2)	35.78	43.33	67.10	94.26	126.47	161.05	195.72	231.62	269.37	308.38	
Real Net Worth ($1,000)											
Maintain Herd (Scenario 1)	1,831.37	1848.78	1872.52	1889.87	1896.15	1909.82	1934.20	1974.20	2023.03	2070.90	
Herd Culling (Scenario 2)	1834.42	1851.59	1873.01	1889.26	1895.02	1909.15	1933.90	1974.22	2023.32	2071.30	

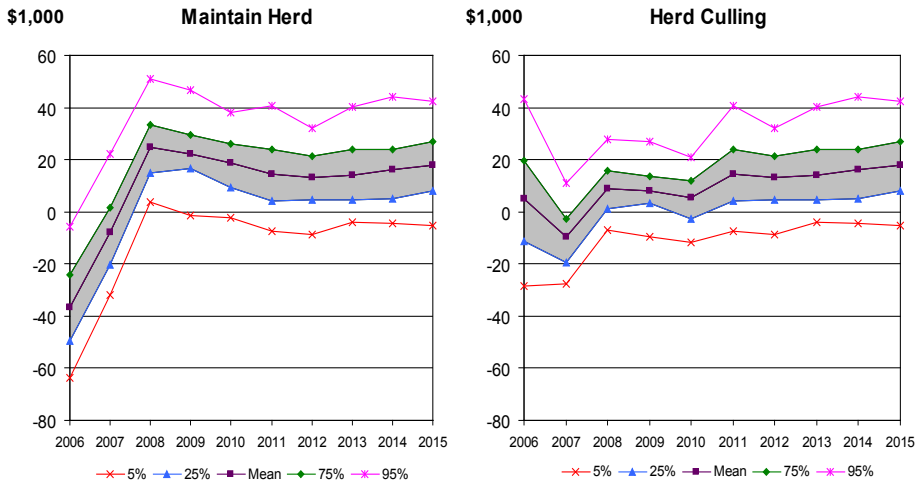
Missouri) with costs adjusted for inflation over the planning horizon.

The projected financial position and performance was evaluated across five major categories including liquidity, solvency, profitability, repayment capacity and financial efficiency. Representative measures were chosen for each of these five categories and are presented in tabular and/or graphical format for each scenario. Each measure chosen provides information with respect to the projected variability in the ranches financial position and performance. When taken as a whole, these measures provide insight into the risk bearing ability of the ranch throughout the planning horizon.

Results

A comprehensive financial projection including price and weaning weight risk of the two different scenarios are illustrated in Table 2 and Figures 1 and 2. Table 2 represents the average outcomes for selected financial projections, while the graphical presentations (Figures 1 & 2) illustrate the range of possibilities for the selected variables. Total cash receipts average $108,860 over the 10-year period for the scenario which looks at maintaining the current cow herd size and buying supplemental feeds, 4.8% more than the scenario which reduces the herd size in 2006. However, if we take a look at the initial year of the projection (2006), we see that total cash receipts for scenario 2 averages $139,620 or 8.2% more in receipts than scenario 1. This reflects the 20% culling of cows in scenario 2 in 2006. From 2007-2010, the total cash receipts are much lower in scenario 2 due to smaller herd size. The lower cash receipts in scenario 2 reflect herd culling in 2006 and then rebuilding the herd in 2007 – 2010. Average cash costs were $165,530 in 2006 for scenario 1 which maintained the current herd size, while average cash cost for scenario 2 in 2006 was $134,446. This is a difference of 23.1% in cash costs in 2006. Looking at the 10 year average, the study found only a 4.9% difference in cash costs, with scenario 1 averaging $99,120 in cash costs and scenario 2 averaging $94,449 in total cash costs.

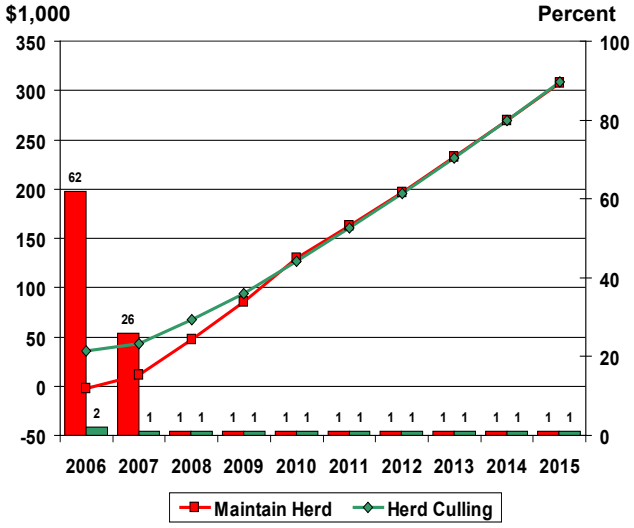
Figure 1. Projected Variability in Net Cash Farm Income for the South Texas Representative Ranch



Although profitability over the ten-year period between the two scenarios is not greatly different, in 2006 there is approximately a $42.000 difference in Net Cash Farm Income between herd culling (scenario 2) and maintaining the herd (scenario 1). Net cash

There is still no clear cut answer on which strategy is the most beneficial to livestock producers long-term.

Figure 2: Ending Cash Reserves and Probability of Having to Refinance Operating Note for the South Texas Ranch



farm income (NCFI) for 2006 is projected to be -$36,510 for the scenario which maintains the current herd size and $5,180 for the herd culling scenario (Table 2, Figure 1). For 2006-2015, NCFI is projected to average $9,740 for scenario 1 and $9,420 for Scenario 2. The negative NCFI in 2006 for scenario 1 is largely due to the increased feeding costs associated with feeding 200 cows, while the NCFI for scenario 2 portrays receipts from culled cows as well as a reduction in feed costs. In the years required to rebuild the herd (2007-2010), the profitability advantage is in scenario 1 where average NCFI is $14,498 compared to only $3,283 for scenario 2, where the herd size is smaller and the ranch is purchasing replacements to rebuild capacity. Over most of the 10 year projection, cash receipts are projected to generally decline along with the projected cattle prices. Figure 1 also illustrates the risk in NCFI, with the range indicating profit levels from approximately -$63,800 to $44,300 for the scenario which maintains the current herd size (scenario 1) and -$28,500 and $44,300 under scenario 2 (culling the herd size). These ranges suggest that there is significant risk of operating losses over the projected period. The shaded area of the graph suggest that the operation is expected to have a 50% chance of realizing a -$49,100 to $27,100 profit level in scenario 1 and -$19,100 to $27,100 in scenario 2.

The liquidity of the ranch is measured by the ending cash balance (Table 2, Figure2). This figure shows the impacts of each of the two scenarios on the risk associated with ending cash balances by pointing out the probability that ending cash will fall below zero, requiring a carryover debt. In scenario 1, average ending cash values are projected to grow from -$2,890 to $307,900 during the ten-year period. This compares to the average ending cash values in scenario 2 which are projected to reach $308,380 by 2015. Figure 2 illustrates average ending cash balances and risk of cash shortfalls. During the first two years of the study, scenario 1 has a 62% and 26% probability of carryover debt, while scenario 2's probability of carryover debt is minimal.

Overall equity and solvency measures are similar between the two scenarios. The Real Net Worth values for both scenarios grow to just over $2 million on average by 2015.

Implications

Some observations that may affect management decisions in future droughts include:

- Current high cattle prices may be masking the effects of drought and high feeding costs
- With the high cattle prices and the hay shortage today, the best management options may not be the same as during cyclic periods of low cattle prices and low or high hay costs
- A producer must weigh the future cost of herd replacement when making decisions to cull and how much to cull
- Ability to "manage" a drought is directly affected by the operation's debt situation.

The projected results of this study further depict why these two strategies of herd management are continually discussed during drought situations. Unfortunately, there is still no clear cut answer on which strategy is the most beneficial to livestock producers long-term. Each individual operation must assess their short and long term goals and decide for themselves on which management strategy would be the most valuable.

Reference

Young, A.M., Paschal, J.C., Hanselka, C.W., Klose, S.L. & Jupe, M. (2006, September). Impact of a Prolonged Drought on South Texas Ranches". Texas Cooperative Extension, Department of Agricultural Economics, Texas A&M University System, FARM Assistance Focus Paper 2006-2.

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