FARM Assistance Focus

Texas A&M AgriLife Extension

Profitability of Beef Cattle Best Management Practices in South Texas: Improving Profitability with Genetically Superior Sires and Higher Breeding Ratios

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Farm Assistance Focus 2016-2
March 2016

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Texas A&M AgriLife Extension Service

FARM Assistance
Planning Solutions

Successful managers will select high quality bulls with superior genetics to improve overall herd performance and profitability.

Cow-calf producers have been expanding breeding herds since 2014 in response to high cattle prices, a strong demand for beef, and better forage conditions across Texas and the U.S. When planning herd growth, bull selection and progeny performance are important considerations that can affect the number of calves weaned, calf weight and quality, and bottom-line profits. Successful managers will select high quality bulls with superior genetics to improve overall herd performance and profitability. It is also important to breed these superior bulls to as many cows as possible in order to maximize the use of their genetics and to offset the additional cost of the superior sires.

"Best management practices," such as selection of high quality and reliable performing bulls, are proven methods for improving overall herd performance and ranching profitability. However, many beef producers often use price as their primary criteria in selecting a breeding bull in an attempt to control costs. A common saying is that a mature breeding bull is worth five weaned calves or three fed steers ($3,500-$5,000 in today's dollars), and that might be on the low end for some bull buyers.

Many ranchers will chose a less expensive bull based on price alone, without considering the value of the proven genetics in the higher priced bull. Often the difference in prices between two bulls is only a few more calves, a few more pounds of weaning weight per calf, or a few more cents

Table 1: 2016 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	$50,000/year
Native Pasture	1,800 acres
Improved Pasture (Bermuda)	200 acres
Ownership Tenure	100%
Royalty Income	Not Included
Hunting Income	$10/acre
Herbicide/Acre (Native Pasture)	$0.90
Herbicide/Acre (Bermuda)	$12.00
Fertilizer/Acre (Bermuda only)	$30.00
Number of Cows	200
Number of Bulls	6 or 8
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	$1.88/lb. or $1.98/lb.
Heifer Prices	$1.55/lb. or $1.65/lb.
Cull Cow Prices	$.70/lb
Cull Bull Prices	$.90/lb
Bred Cow Prices	$1,600/head
Replacement Bull Prices	$3,000 or $4,500
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

per pound of weight when sold. Any of these are quite doable with a genetically superior bull. Bulls with higher calving ease can produce 3-4% more live calves worth an extra $3,000 - $4,000 over the life of a bull. The value of longevity of replacement heifers, adding 2-3 years of production per crossbred female is worth an added $3,000-$6,000. The value of an above average bull compared to the average of a given breed can be $3,500-$7,000 more (Marshall, 2012). Considering the genetics for growth and maternal effects, an above average bull could be worth at least $5,000 more than an average one. But, this doesn't mean that is what you should pay for it. That is what it is worth (Wheeler, 2000).

However it is not enough to just use genetically superior bulls, they need to be bred to as many cows as possible to maximize the impact of his genetics in the cowherd and profitability. Increasing the breeding ratio (number of cows bred to a bull or bull to cow ratio) assists in offsetting the additional cost of the genetically superior herd sire. This study illustrates the financial implications of genetically superior bull selection and an increased breeding ratio on herd performance and 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 effective bull selection by South Texas ranchers. Four scenarios were evaluated: 1) 8 genetically average bulls and 200 cows (1 bull to 25 cows, 1:25); 2) 6 genetically average bulls and 200 cows (1:35); 3) 8 genetically superior bulls and 200 cows (1:25); and 4) 6 genetically superior bulls and 200 cows (1:35).

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. Under normal stocking conditions, the cow herd includes 200 cows (1 animal unit to 10-acre stocking rate) 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 2016, 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 January 18, 2016. It was assumed that calves from genetically superior bulls would bring a $50/head premium on average. For the purpose of this analysis, the $50/head premium is generated with a $0.10/lb price premium on weaned steers & heifers (average weaning weight is 500 lbs). In reality, the increased value could be a result of any combination of heavier weaning weights, price premium for quality genetics, improved calving rates, and/or reduced death loss.

Calving rates and death loss assumptions in the scenarios were based on research conducted by Texas A&M AgriLife Research and Extension and others. It was also assumed that reproductive management (pregnancy testing all cows, BSE testing for bulls, and vaccinations for reproductive and other diseases) and calf management (clostridial vaccinations, castration, and growth implants) and deworming all cattle and calves as needed was practiced by the producer.

Bull selection can have a major impact on herd performance and bottom-line profits.

The base year for the 10-year analysis of the representative ranch is 2016 and projections are carried through 2025. 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. Profitability and liquidity were measures 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. 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 net of taxes. Both measures provide information with respect to the projected variability in the ranch's financial position and performance expectations of the ranch throughout the 10-year planning horizon under each bull selection scenario.

Results

Financial projections for each reproductive management practice scenario are given in Table 2. These results represent the average outcomes for net cash farm income, cash flow and other financial projections for 2016-2025. Figure 1 illustrates the range of possibilities comparing selecting 8 genetically average value bulls to selecting 8 genetically superior bulls. It should be noted that off-farm income and hunting contributes somewhat to the cash flow of the ranching business in all scenarios.

All four bull selection scenarios evaluated offer the potential to generate profitability in the cow-calf operation (Table 2 and Figure 1). With 8 genetically average bulls and a breeding ratio of 1:25 (Scenario 1), the average net cash farm income (NCFI) is $6,840/year or $34.20/cow/year and $38/

Figure 1. Projected Variability in Net Cash Farm Income, 200 Cows

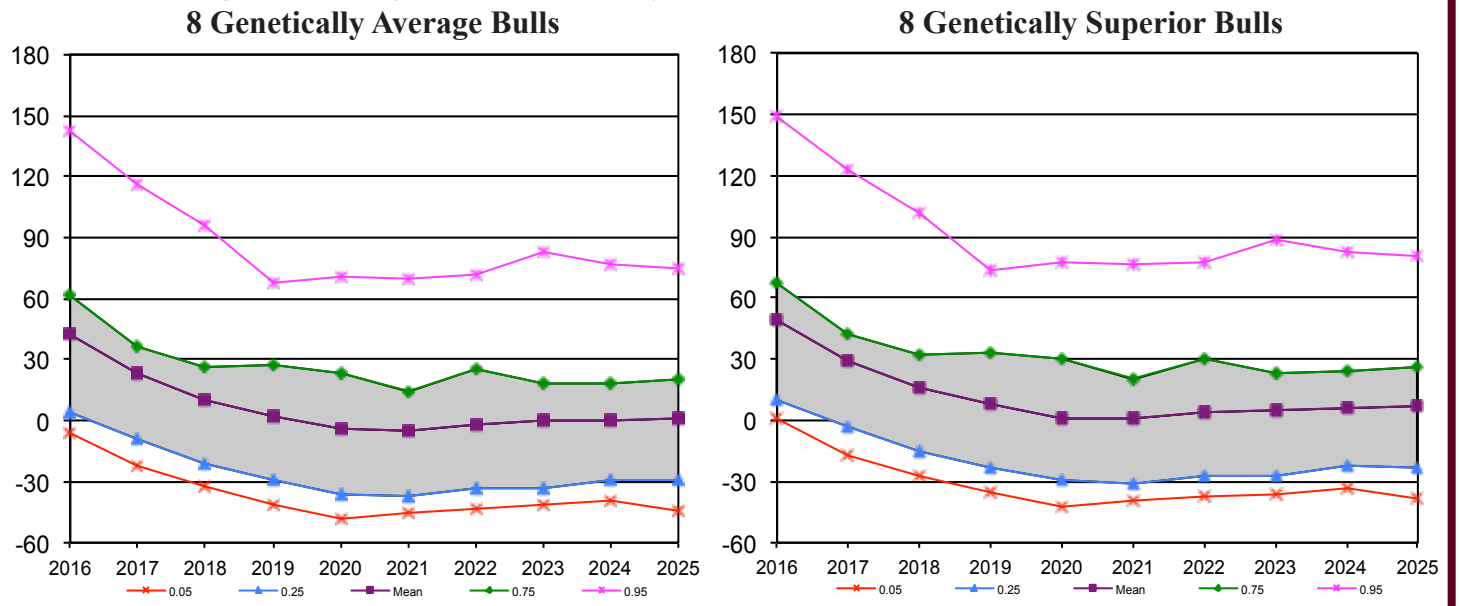

Table 2: 10 -Year Average Financial Indicators for a South Texas Representative Ranch, 200 Cows

Scenario		10-Year Average Per Year					Cumulative 10-Yr Cash Flow/ Cow ($1000)
		Total Cash Receipts ($1000)	Total Cash Costs ($1000)	Net Cash Farm Income ($1000)	Net Cash Farm Income/Cow ($1000)	Net Cash Farm Income/Calf ($1000)	
1	8 Average Bulls	153.62	146.78	6.84	0.03420	0.03800	2.31895
2	6 Average Bulls	152.91	145.39	7.53	0.03750	0.04183	2.34730
3	8 Superior Bulls	162.63	149.95	12.68	0.06340	0.07044	2.52220
4	6 Superior Bulls	161.92	147.90	14.02	0.07010	0.07789	2.57585

calf/year. The operation begins the first year of each scenario with a total cash balance of $10,000, and if profitable, accumulates cash over the 10-year period. Average cash reserves, at the end of the 10-year projections for Scenario 1 is $2,318.95/cow.

Assuming increased bull quality, performance and herd management allow for fewer bulls, Scenario 2 has 6 genetically average bulls and a breeding ratio of 1:35 which offers a slightly higher potential for improving profitability and financial performance of a cow-calf operation (Table 2). NCFI averages $7,530/year over the 10-year projection, 10.1% more than Scenario 1, the 8 genetically average bull scenario. The returns equate to $37.50/cow, $3.30/cow more Scenario 1. Returns per calf were $41.83/calf, an increase of $3.83/calf. These increases were due largely to more calves to sell per bull, and lower bull purchase and other bull related costs. Average cash reserves at the end of the 10-year period increase to $2,347.30/cow on average, 1.2% more than Scenario 1.

Scenario 3 assumes 8 genetically superior bulls are used in the herd with a breeding ratio of 1:25. NCFI averages $12,680/year, 85.4% more than Scenario 1 where genetically average bulls were used with a 1:25 breeding ratio. This demonstrates the value and importance of paying more for and using genetically superior bulls from an economic standpoint. This amounts to a $29.20/cow and $32.44/calf increase over using average quality bulls (Scenario 1). Average ending cash reserves improve by $203.25/cow.

The last scenario uses genetically superior bulls and a breeding ratio of 1:35 (Scenario 4). In comparison to Scenario 1, with genetically average bulls and a 1:25 breeding ratio, NCFI increased by 105%, more than double, to $14,020. NCFI using genetically superior bulls but lower breeding ratio (Scenario 3) to using genetically average bulls with a higher breeding ratio (Scenario 2) shows increases of 10.6 and 86.2%, respectively. This indicates that higher valued, genetically superior bulls can be more profitable (Table 2). Scenario 4 has a net increase of $35.90/cow and $39.49/calf over Scenario 1. Ending cash reserves increases by $256.90/cow.

Implications

Bull selection can have a major impact on herd performance and bottom-line profits. Bulls should be more than cow fresheners, only used to produce an average performing calf crop. Higher prices

Cow-calf producers should continue to implement best bull selection and other management practices that improve the bottom-line and financial performance of their operation.

for better quality genetics will normally be returned from higher returns from calf sales. Through improved genetics, calves from above genetically superior bulls will out gain and out-weigh and have higher value per head than calves from genetically average quality bulls. Not only are the calves of higher quality (heavier, perhaps more uniform) and more desirable to the buyer who is willing to pay more, the replacement females from these genetically superior bulls will improve the genetics of the cow herd. If the females are crossbred, besides heterosis for fertility, milk production and growth, they will exhibit greater productive longevity too. If managed properly, these bulls can also be more widely used in the cowherd, breeding more cows than is common practice. While off-farm income, hunting, and other sources of income will continue to help sustain cattle operations, improving the quality of calves can significantly increase direct profits from actual cattle sales.

Actual results will likely vary by producer, bull selection, production region, cattle markets, and marketing efforts. Cow-calf producers should continue to implement best bull selection and other management practices that improve the bottom-line and financial performance of their operation.

References

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Wheeler, John (2000). What's a Good Bull Worth Really? wwn.noble.org/Ag/livestock/bulletin. March 2000 (Accessed 2/26/16).

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