Ranching, Risk, and Res

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Livestock producers in Wyoming, and across much of the western United States, are accustomed to dealing with drought. Yet, producers can always benefit from insight as to how best to cope with the decreases in forage associated with reduced precipitation. Often, these droughts force ranchers to carry smaller herds, increase costs associated with purchased feed, and increase short-term debt, all while dealing with fluctuating cattle markets.

In 2005, researchers in the Department of Agricultural and Applied Economics at the University of Wyoming attempted to answer the tough question of "How can I deal with drought?" A survey of Wyoming cattle producers found operations across the state had tried a number of strategies to deal with drought conditions. The most common responses included some level of herd liquidation and/or purchasing additional feed. However, results showed that a wide variety of strategies had been considered across the state. We analyzed a suite of these alternative strategies across a wide range of both market and climatic situations to better understand the potential long-term profitability of these strategies.

These analyses required setting up a ranch "on paper" and running the model ranch through various precipitation and price shocks across these different strategies to see how the ranch fared over time. This "paper ranch" was set up to resemble a typical 600-cow ranch in central Wyoming. The ranch used the alternative strategies across a series of 86 years of precipitation data, and 27 different price cycle scenarios. In addition to overall profitability, special attention was given to how each scenario performed across a range of potential periods of drought. This offered the benefit of providing insight into both the current drought and future drought scenarios that might occur.

The base strategy allows partial herd liquidation as a drought mitigation approach, and allows the paper

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ranch to choose the most profitable herd size in each year given available forage resources and cattle prices. The second strategy is the same as the base strategy with the added option to purchase additional hay to feed in summer months when requirements traditionally met through grazing are negatively impacted by drought conditions. The option to wean calves early (August 1 as opposed to October 15 in the base model) and subsequently market them earlier than normal, is another strategy aimed at reducing herd forage requirements in the summer, allowing a producer to minimize culling of breeding stock. All of these strategies are considered to be reactive, as management decisions occur as the drought conditions appear.

A more proactive strategy to deal with forage availability and market signals utilizes later calving dates (June 1 as opposed to April 15 in the base model), but maintains the October 15 weaning date

and November 1 sale date. As expected, calves born later are sold at lighter weights than traditionally-born calves. However, weights for late-season calves are not assumed to be drastically different from earlier-born calves (previous research at the University of Wyoming suggests that later-born calves usually experience heavier birth weights than early-season calves). This strategy aims to better align herd requirements with growing season forage production, thereby reducing reliance on raised or purchased feed such as hay. Previous research suggests the potential of additional benefits associated with late calving (such as reduced cow costs) that can increase overall profitability (see Younglove et al., 1998, May et al., 1999, and Kruse et al. 2007).

However, as not all operations will likely see all of the proposed benefits, we evaluated two late-calving scenarios. The basic late-calving scenario only alters calving dates (and associated herd requirements), weaning/sale weights, and the prices associated with lighter sale weights. The second late-calving scenario analyzed the additional potential benefits that may or may not be realized by individual producers trying this strategy. Our specific assumptions of the second late-calving strategy include increased breed back, reduction in calf death loss, a reduction in yearly cow costs (due to less calving difficulties and labor costs), less supplementation needs, and a reduction in yearly fixed costs representing cost savings associated with less required buildings for calving (given most calving would take place out of doors).

While not all of these additional benefits may be experienced by all producers (for example, it is unlikely an operation would eliminate existing barn space due to reduced calving indoors), the analysis included all of these benefits to get an idea of the potential impact of a best-case scenario associated with a conversion to late calving. It should be noted, however, that the model assumes the transition to late calving has already occurred, and none of the conversion costs (transitioning breeding stock, updating grazing strategies, etc.) have been included.

The final strategy analyzed is also proactive in terms of drought management and was modeled as a cow/calf/yearling operation. In this scenario, an operation is expected to retain all weaned steers over the winter with the goal of selling yearling steers the following November. However, in order to accommodate for the reduced forage supply associated with drought, this scenario gave producers the option to sell short yearlings on May 1 in order to reduce herd forage requirements, if needed. As with the late-calving scenario, it is assumed that conversion to a cow-yearling operation has already occurred, and neither the initial loss of revenues associated with a forgone steer-calf crop nor any costs associated with the conversion are included in this analysis.

Results

In general, summer feeding did improve overall average profitability. However this alternative was only more profitable than the liquidation-only scenario when compared to the remaining management options (Table 1). Also, caution must be used when implementing the summer feeding strategy, as most of the benefits of feeding through a drought are realized post-drought. Often the benefits of increased calf sales associated with maintaining a larger herd size through the drought were matched by the increased

PICTURED: CATTLE GRAZING IN WYOMING. ISTOCKPHOTO.COM.

costs of feed during drought years. The major benefit of this strategy is the increased calf sales post-drought when feeding (and associated expense) was no longer required. This strategy was most effective when cattle prices increased after the drought. If cattle prices were expected to decline post-drought, this strategy was not profitable.

Our results indicate late calving may be a promising strategy, but some caution must be exercised when considering this alternative as success is dependent on realizing some potential (but not guaranteed) benefits with this strategy. There are also some potential disadvantages of late calving that were not incorporated such as conflicting labor demands, reliance on public grazing during summer months, as well as the risk of utilizing common grazing allotments.

The scenario that retained all steer calves over the winter with the option to sell in early summer or fall was the most promising strategy to adjust to drought. Generally, retaining ownership of steer calves over the winter, with the option to sell if forage supplies become scarce, outperforms both partial liquidation and summer feeding, and results in lower profit variability than late calving or early weaning with only slightly lower profit overall when compared to late calving with additional benefits across most of the scenarios analyzed (Table 1).

As in most of the West, Wyoming suffered a severe drought this summer, with the effects still being felt. There were many efforts aimed at helping to ease the impacts of drought, ranging from drought planning efforts early in the season, and late-season drought recovery planning. Our model ranch was used to show the risks and rewards of the alternative strategies we analyzed. Later in the season, we used this ranch as a tool to demonstrate how some alternative strategies may be helpful in making the ranch more resilient in the future, especially given the cattle outlook in the coming years.

The representative ranch was very useful in demonstrating the impacts of price expectation on current year decisions. Given the high cattle prices this year, we were able to show some benefits to increased culling this year in order to maintain future productivity. Given the high cost of hay this year, many producers were in a better position to sell livestock, and minimize the damage to rangelands of excessive grazing, while trying to keep herd costs in check. Also, given the expected increased costs of breeding stock in the coming years with expected herd expansion, many producers are now considering restocking at least part of their herd with yearling animals. Including stockers offers a way to keep costs down in the short term, as well as add flexibility to destocking decisions in case drought carries into the future. Ranches that are more resilient to the risk of drought in the future should also improve the resilience of small rural communities in the West that have economies dependent on agriculture.

Author's Note: This work has resulted in a series of Extension bulletins and programs. For further information see Ritten et al., 2011a, Ritten et al., 2011b, Ritten et al., 2011c, and Ritten et al., 2011d. For academic papers see Bastian et al., 2009, Ritten et al., 2010a and Ritten et al., 2010b. These are listed at the end of the publication in the 'References' section.

TABLE 1. RANGE AND DISTRIBUTION OF TOTAL NET DISCOUNTED RETURNS OVER ENTIRE 86-YEAR HORIZON.

	Partial Liquidation Only	Summer Feeding	Early Weaning	Late Calving - Basic	Late Calving with Additional Benefits	Retain Steers
Minimum	$885,562	$977,329	$1,241,704	$1,382,708	$1,556,828	$1,440,733
Average	$1,034,335	$1,105,798	$1,415,089	$1,532,248	$1,712,451	$1,591,260
Maximum	$1,121,476	$1,189,350	$1,542,872	$1,640,996	$1,826,303	$1,683,501
Standard Deviation	$66,743	$62,143	$81,951	$80,402	$83,309	$65,694

(ADAPTED FROM RITTEN ET AL., 2011A.)