The drought of 2011 had long-lasting impacts on cow-calf producers in the U.S. Southern Plains. Between January 2011 and January 2012, beef cow numbers in Texas were down 13.1%, down 14.3% in Oklahoma and down 10.9% in New Mexico (Livestock Market Information Center, 2012), leading to a 3.1% reduction in the U.S. beef cow herd. Rebuilding herds poses many financial challenges to individual producers, particularly generating sufficient cash flow to rebuild. Large numbers of cull cows were marketing during the summer of 2011, depressing cull cow prices. So, many cull cows generated lower revenue than sales made earlier in the year. Combined with high feed prices, cash reserves for many producers are not sufficient to immediately rebuild herds. With reduced cow numbers in 2012, beef supplies are tight, leading to higher prices for replacement heifers. Now, cow-calf producers have to bid expensive replacement heifers away from feedlots. These factors combine to make rebuilding financially difficult. To advise producers on rebuilding, we have developed and analyzed financial impacts of herd rebuilding strategies for Oklahoma producers.

Analyzing rebuilding strategies is complicated by several factors, including the pre-drought financial position of the producer, degree and timing of herd liquidation, management skill of the producer, off-farm income, family living expenses, and uncertainty over future replacement heifer prices, calf sale prices, and production expenses. While our analyses do not accurately model any single producer, they provide a framework for producers to analyze the financial implications of their rebuilding strategies and suggest approaches that are more financially feasible than others.

**Rebuilding Strategies and Scenarios**

Producers who liquidated entire breeding herds in 2011 face the biggest cash flow demands associated with rebuilding. Their difficulties are compounded with a lack of cow-calf income in 2012. So, we focus our analysis on these producers with three land tenure positions: rent all land, owned land with land debt, and owned land without land debt. Land tenure positions are analyzed under three rebuilding strategies: slow rebuilding using stockers, fast herd rebuilding with cow/calf pairs, and leasing cows. We assume that pasture can only be stocked at 50% of historical levels in 2012, 75% in 2013 and 100% thereafter.

Our base herd is a 100-head (85 mature cows and 15 bred heifers) commercial cow-calf herd with 15 replacement heifers and three bulls as of January 1, 2011. The cows are assumed to be moderate-framed and 1100 pounds on average. All breeding stock, including replacement heifers and bulls, and calves are assumed to have been sold in July 2011. Two ranches are modeled, one with native pasture (1,000 acres) and one with introduced grass pasture (160 acres each of fescue and Bermuda, for a total of 320 acres).

Three land tenure scenarios are considered. In the first scenario, the producer purchased pasture in July 2011 and borrowed 50% of the total investment. Introduced pasture is assumed to have been purchased ten years prior to the drought (July 1, 2001) at $1,000 per acre and has a current market value of $1,400. Assuming 50% debt financing and 6% interest rate over 20 years, the July 1, 2011 loan balance was $160,000. Similarly, native pasture was purchased for $800 per acre in 2001 and has
Financing Herd Rebuilding After the 2011 Drought (cont.)

a current market value of $1,100 and July 1, 2011 loan balance of $400,000. The second scenario has pasture with no debt. The final land tenure scenario has land rented with rental rate varying by forage type.

In the slow-rebuilding strategy, with no cows on pastures, forage is available for a grass stocker enterprise. The profitable stocker enterprise turns investment dollars more quickly than cows. Additionally, stocker heifers can be used as a replacement heifer source. Our fast-rebuilding strategy has producers buying cow-calf pairs over three years. While achieving target herd size quickly, this strategy has the highest cash flow demands and higher incurred debt. Finally, we evaluate leasing cows as a rebuilding strategy. While this option may not be available to all producers, it may relieve cash flow stress for producers who have opportunities to lease cows.

Full details of our model assumptions and results will soon be available as an extension factsheet. We summarize our results here.

Results

In Table 1, annual herd inventories and purchases are reported for the slow-rebuilding strategy with stockers following total liquidation on introduced pastures. Stockers are utilized to provide income and source of replacement heifers. Forage that would normally be grazed by cows is instead grazed by stockers. As of January 1, 2012, the breeding herd inventory is zero cows and bulls. Stockers are purchased in the spring of 2012 with stockers sold in the fall except for 20 heifers that are retained to begin rebuilding. In 2013, cow/calf pairs and more stockers are purchased, including 25 heifers. This continues until 2015 when no additional purchases are made. Bulls are purchased in 2013 and 2014. By 2016, the rebuilding is complete.

Cash flow is problematic for most of the introduced and native pasture scenarios in most years. If a cash reserve was generated from the herd liquidation in 2011, the reserve is sufficient to cover annual cash flow deficits in all years. If a producer did not preserve cash from the 2011 liquidation, additional debt would be acquired in most of the years and scenarios.

Table 1 reports the inventory and purchase assumptions for the fast-rebuilding strategy. Because of the added debt associated with cow-calf purchases, these scenarios all have higher cash flow demands than corresponding slow-rebuilding scenarios. As with the slow-rebuilding scenarios, the debt-free, owned land and rented land scenarios have the best projected cash flow. Given a 2011 liquidation-generated cash reserve, the owned, debt-free pasture (either introduced or native) producer has sufficient cash flow avoid debt accumulation from fast rebuilding. Similarly, producers leasing pastures can avoid debt accumulation. However, producers owning pasture with debt, either introduced or native grasses, have operating debt accumulating by the end of the 2015. Debt-to-asset ratios improve from 2014 to 2015, indicating that more term debt is paid than operating debt is accumulated.

Table 1. Cattle Inventory Jan, 1 with Alternative Rebuilding Strategies

<table>
<thead>
<tr>
<th></th>
<th>Rebuilding Slowly from Total Liquidation</th>
<th>Rebuilding Fast from Total Liquidation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cows</td>
<td>85 0 0 25 45 95</td>
<td>85 50 80 100</td>
</tr>
<tr>
<td>Bulls</td>
<td>3 0 0 1 3 3</td>
<td>3 2 2 3</td>
</tr>
<tr>
<td>Bred heifers</td>
<td>15 0 0 20 25 5</td>
<td>15</td>
</tr>
<tr>
<td>Replacement heifers</td>
<td>15 0 20 25 5 15</td>
<td></td>
</tr>
<tr>
<td>Purchases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stocker steers</td>
<td>172 215 146</td>
<td></td>
</tr>
<tr>
<td>Stocker heifers</td>
<td>100 25</td>
<td></td>
</tr>
<tr>
<td>Cow/calf pairs</td>
<td>25 25</td>
<td>50 30 20</td>
</tr>
<tr>
<td>Bulls</td>
<td>1 2</td>
<td>2 1</td>
</tr>
</tbody>
</table>
Financing Herd Rebuilding After the 2011 Drought (cont.)

So, fast rebuilding may be feasible for even producers with outstanding debt on land if their pre-2011 financial position was healthy.

For cow leasing strategies, rebuilding will take several years. While leasing has the lowest cash flow demands, it also generates the lowest net cash flow. Operating debt accumulates for all of the introduced pasture scenarios and the owned land with debt native pasture scenario. This strategy appears to work best with two native pasture scenarios: owned debt-free and leased. In the remaining leasing scenarios, operating debt accumulates in 2014 or 2015. It is important to note that no debt for purchasing cows has accumulated in these leasing scenarios, but the owned cow herd increases over time. The producer retains heifers from his/her share of the calf crop. So, the owned cow herd increases steadily after 2013.

Results are from our analyses are encouraging (Figures 1 & 2). Regardless of land tenure, pasture type, or rebuilding strategy, rebuilding appears to be financially feasible assuming proceeds from herd liquidation were preserved to assist with financing. In some scenarios, operating debt accumulates, but generally debt-to-asset ratios remain healthy throughout the years analyzed. However, our analyses are limited to producers who were in reasonable financial health prior to the 2011 drought. Producers who were financially struggling prior to 2011 will likely be in worse condition following the drought. Regardless of financial position, producers should seek advice from their county Extension educator about an appropriate rebuilding strategy given local pasture conditions. Free confidential farm business planning assistance is available through OSU IFMAPS program at 1-800-522-3755.

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**Figure 1.**

Net Cash Flow for Owned Land With No Debt: Native Pasture

**Figure 2.**

Net Cash Flow for Owned Land With No Debt: Introduced Pasture
This is the time of year that cattle producers need to start monitoring or treating cattle for ear tick populations. There have been several reports across the state with cattle severely infested with ear ticks. The majority of the cattle have the Gulf Coast Tick but some have been reported to exhibit a “flop eared” condition which is more likely caused by the Spinose Ear Tick.

Insecticide impregnated ear tags are the most effective treatment for Gulf Coast Ticks. Usually ticks will fall off after one week from tagging the animals and a small proportion of the ticks will remain attached but are dead. In some cases where cattle were tagged with an insecticidal ear tag, the ticks become agitated and moved to the tail head region. If this is observed, additional control should be applied in the form of an approved pour-on or spray for beef animals.

The spinose ear tick is a common pest of cattle, horses, and other domestic and wild hosts throughout Oklahoma. The tick is found in the ear canals of its host. The presence of large numbers can cause severe irritation, inflammation and deafness of the animal. Secondary bacterial infections may cause sloughing of tissue into the ear canal. Infested cattle develop a “flop-eared” condition and show discomfort in movement of the head.

Directed sprays that can be targeted deep into the ear of the animal are the most effective means of controlling this tick. If these ticks are present and an infection is seen or smelled then an additional antibiotic application should be given. Another area that should be targeted with a premise insecticide spray (non-animal applications) should be barns or shaded loafing areas where feed is being fed.
When Is Fertilizer Too Expensive?

J.J. Jones, Area Agricultural Economics Specialist, SE District

In 2011, Oklahoma producers went through one of the worst droughts in Oklahoma history. During this drought hay production was reduced by 50%-70% and hay inventories were depleted. Producers purchasing hay had to seek hay from other states and pay in excess of $70/bale. Now in 2012 producers looking to rebuild hay inventories are faced with fertilizer prices between $500 and $700 per ton. Is this too much to pay for fertilizer?

The answer to this question will depend upon an individual producer’s stocking rate and forage needs. But to determine at what price fertilizer becomes economically cost prohibitive, let’s compare the daily cost of feeding a cow with forage grown with fertilizer versus purchased hay.

Assumptions

An average cow will eat 30 lbs of forage per day. She will also trample on, lie on, defecate on or waste about 13 lbs of forage per day. This totals 43 lbs of forage/cow/day.

Bermuda grass will produce 1 ton of forage with no fertilizer. With the addition of 50 lbs of nitrogen (109 lbs Urea), bermuda grass will produce 2 tons of forage. Fertilizer is commercially spread at a charge of $5.00/acre.

Hay bales purchased are 1200 lbs. and the same quality as the forage grown in the pasture.

Comparison

Chart 1 compares the cost of providing a cow 43 lbs of forage per day with either fertilized pasture or purchased hay. The left side of the chart represents the cost/day. The bottom of the chart represents the cost of Urea on a per ton basis.

The horizontal line represents the daily feeding cost of purchased hay at $35 and $45 per bale. The columns represent the cost per day to feed forage grown using fertilizer at different Urea prices. When a column is below the line it is more cost efficient to use fertilizer instead of purchased hay. If the column is above the line, it is more cost efficient to use purchased hay.

The chart shows that when Urea fertilizer is priced at anything less than $1,000/ton, it is more cost efficient to fertilize than to feed $35/bale hay. At no time does fertilizer become more expensive than feeding hay priced at $45/bale.

Chart 2 shows the cost of fertilized production when 50 lbs of phosphorus is required. 109 lbs. of Diammonium Phosphate (18-46-0) is used with 67 lbs. of Urea to reach 50 lbs. of phosphorus and nitrogen per acre. Assume that Urea is $650/ton (current average price). The DAP price ranges from $400 - $1,000 per ton.

Because of the added cost of phosphorus, the price where fertilizer becomes cost prohibitive decreases. Now if a producer expects hay to be $35/bale, DAP would need to be less than $600/ton to compete when Urea is $650/ton.

If a producer expected to pay $45/bale, then the DAP price would have to increase to almost $900/ton to be too expensive when Urea is $650/ton.

A producer could lessen the cost of production by only fertilizing ½ of their acreage with DAP and increasing the amount of nitrogen to 100 lbs./acre on that half. This would produce the same amount of forage as fertilizing the whole pasture with only half the cost of the DAP fertilizer.

Conclusion

Although fertilizer prices are relatively high compared to the past, it is still more economically feasible to fertilize pasture instead of buying hay. Producers who elect not to fertilize to meet forage needs either spend more money in the fall to purchase hay or need to reduce stocking rates to match forage availability.
Many ranchers plan to replenish their hay supplies during the upcoming growing season as weather conditions permit. Round bales are often stored outside and unprotected because their shape enables them to shed precipitation. Since nutrition costs are often the most expensive aspect of annual cow costs, it is important to manage hay costs with proper hay storage. Questions often arise concerning storage losses with exposed hay bales and the economic feasibility of providing some type of protection.

One of the biggest problems in determining total storage cost of a system is estimating the loss of hay value during storage. In Oklahoma, round bales stored outdoors should be fed by March 1 following the year harvested or dry matter losses alone can become excessive as shown in Table 1. Losses from unprotected outdoor storage may exceed 45% when compared to an enclosed barn over the long-term.

Table 1. Percent dry matter loss of round hay bales

<table>
<thead>
<tr>
<th>Storage Method</th>
<th>Storage Period</th>
<th>5-20</th>
<th>10-20</th>
<th>15-50</th>
<th>20-30</th>
<th>25-40</th>
<th>30-50</th>
<th>35-70</th>
<th>40-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposed</td>
<td>Up to 9 months</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>Covered</td>
<td>2-4</td>
<td>1-2</td>
<td>2-4</td>
<td>3-6</td>
<td>4-8</td>
<td>5-10</td>
<td>6-12</td>
<td>7-14</td>
<td>8-16</td>
</tr>
</tbody>
</table>

The value of storage depends on the projected hay loss while in storage and the price of hay when sold or used. Table 2 illustrates the value of hay losses given storage loss percentages over a range of hay prices.

Table 2. Value of hay lost in storage ($/ton)

<table>
<thead>
<tr>
<th>Hay Price ($/ton)</th>
<th>Storage Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$80</td>
<td>5</td>
</tr>
<tr>
<td>$100</td>
<td>10</td>
</tr>
<tr>
<td>$120</td>
<td>15</td>
</tr>
<tr>
<td>$140</td>
<td>20</td>
</tr>
<tr>
<td>$160</td>
<td>25</td>
</tr>
</tbody>
</table>

 Poor quality hay as a result of excessive storage loss translates to a higher adjusted price per ton for the edible portion only. For example, a 30% loss for $100 per ton hay equates to an edible weight of only 1400 pounds after waste and an adjusted edible value of $130 per ton. In addition, weathered hay may become more expensive than other crude protein (CP) and total digestible nutrient (TDN) sources.

Hay Storage Cost Evaluator is a spreadsheet that facilitates the evaluation of alternative methods of hay storage, namely, unprotected open storage, open storage with hay covered, and hay barn storage (free download instructions in Summary). Total storage costs include the cost of the storage system and losses in hay value during storage. Annual costs are calculated along with a net present value (NPV) of storage costs discounted over ten years. NPV is a capital budgeting technique that accounts for time value of money in ranking investment alternatives.

While it is impossible to know changing costs or hay values over a ten-year timeframe with certainty, using the best information available will improve the reliability of the results. The value of hay and the changes in nutrient levels (percent TDN and percent CP) associated with different storage systems impact the value of hay losses for each. The cost of a replacement energy source (corn) and replacement crude protein source (cottonseed meal) are necessary to calculate the value of nutrients lost during storage. The discount rate is also important since the
analysis explicitly considers the time value of money over ten years. Think of the discount rate as the risk premium needed to equate the investment associated with hay barn storage with an investment of similar financial uncertainty and rate of return. Figure 1 shows information needed for the analysis.

Next, the initial investment, annual storage costs, and dry matter loss percentages are entered in the Storage Investment sheet (Figure 2). The loss in hay value added to the cost of the storage system provides the total storage cost used in comparing the three types of storage systems.
Hay Storage Cost Evaluator Decision Aid (cont.)

The Analysis Summary in Figure 3 presents the NPV of total costs by storage system. Since the focus is on costs, the NPV calculates the expense of future storage in current dollars and the smallest negative NPV is the preferred investment. In this example barn storage is the least cost alternative, generating a current cost savings of almost $19,000 in comparison to open storage.

Figure 3. Hay Storage Cost Evaluator—Analysis Summary

<table>
<thead>
<tr>
<th>Hay Price per Ton</th>
<th>Open Storage</th>
<th>Open and Covered</th>
<th>Barn Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>$80</td>
<td>($27,083)</td>
<td>($16,782)</td>
<td>($14,111)</td>
</tr>
<tr>
<td>$120</td>
<td>($33,480)</td>
<td>($19,341)</td>
<td>($14,751)</td>
</tr>
<tr>
<td>$160</td>
<td>($39,878)</td>
<td>($21,900)</td>
<td>($15,390)</td>
</tr>
</tbody>
</table>

Summary

All forages packaged in large round bales benefit from protection while in storage, but there are several factors that must be considered in justifying the cost of providing this protection. These factors include hay value, projected storage losses, and other costs associated with storage systems. The Hay Storage Cost Evaluator Decision Aid is a free spreadsheet from the Agricultural Economics Extension website (http://www.agecon.okstate.edu/extension/) designed to help address these factors under a variety of economic scenarios. The user should evaluate expectations carefully given a range of price and storage loss parameters. Since one of the most important keys to controlling costs in livestock operations is to minimize hay requirements, this decision tool will help producers analyze alternatives for hay storage.

It is important to note that the NPV is sensitive to hay price, storage loss, and annual cost assumptions. Everything equal, higher hay values over the ten-year timeframe will create a larger disparity in costs between systems and the opposite is true with lower hay prices. The table below demonstrates NPV sensitivity associated with various hay prices. As hay values increase and/or as storage losses accumulate, proper hay storage can be cost-effective insurance policy in a hay feeding program.

OSU Farm Management is on Facebook. Find us and like us! We’ll be posting timely news and information to support farm and ranch decisionmakers.
The Senate Agriculture Committee released their 2012 Farm Bill draft on April 20. The bill, called the Agriculture Reform, Food and Jobs Act of 2012 passed the Senate Agriculture Committee on April 26 with a 12-4 vote. Full details on the bill can be found here - http://www.ag.senate.gov/issues/farm-bill. The Senate bill includes budget savings of $23 billion and could be debated on the Senate floor soon. The bill contains many key features of the Farm Bill draft prepared for the Joint Select Committee (i.e. Supercommittee) last fall. The bill eliminates direct payments, counter-cyclical payments, and the Average Crop Revenue Election (ACRE) program after 2012 and creates a new Average Risk Coverage (ARC) shallow loss revenue program for commodities. The Supplemental Revenue Assistance Payments program (SURE) expired in 2011 and is not renewed in the bill. However, the Livestock Indemnity Program (LIP), the Livestock Forage Payment (LFP) program, and the Emergency Assistance for Livestock, Honey Bees, and Farm Raised Fish Program (ELAP) are extended until 2017. The bill also establishes two new dairy programs, the Dairy Production Margin Protection Program and the Dairy Market Stabilization Program.

The bill includes several changes to the federal crop insurance program, including a new Supplemental Coverage Option (SCO) insurance plan for crop producers to cover the deductible portion of a producer’s individual insurance policy. In addition, the bill allows for updates to the actual production history (APH) method to establish insurable yields (changes from 60% of the transitional yield to 70% of the applicable transitional yield in 2013). A new Stacked Income Protection Plan (STAX) for Upland cotton producers is created. The bill also includes a request for the Risk Management Agency (RMA) to establish a new peanut revenue crop insurance program.

The major conservation programs are continued, but many programs are combined. The maximum enrollment for the Conservation Reserve Program (CRP) decreases from 32 to 25 million acres through a gradual “step-down” process over the next 5 years. The bill includes a new provision for the enrollment of 1.5 million acres of grasslands in the CRP. In addition, it allows for no reduction in CRP rental rates for harvesting, grazing, or other commercial use of the forage in response to flooding, drought, or other emergency. The easement authorities of the Wetlands Reserve Program (WRP), Grasslands Reserve Program (GRP), and Farmland Protection Program (FPP) are combined into an agricultural conservation easement program.

At this point, the bill is still a work-in-progress and some are concerned that the bill doesn’t contain a strong safety net for commodity producers. The House Agriculture Committee recently finished their D.C. hearings and will likely draft its own farm bill legislation in the next few months. The process is just unfolding and many changes will probably occur before a final agreement is reached for the 2012 Farm Bill. It is likely that the House Agriculture Committee will include both a shallow loss program and target price program and allow commodity producers to choose between the two. It is unclear whether or not a new farm bill will be passed in 2012 or 2013.

New and Updated OSU Publications

- On agecon.okstate.edu/IFMAPS: IFMAPS TODAY Newsletter, April 2012
- CR-3279 Cow-Calf Production Record Software
Oklahoma’s Statewide Women in Agriculture and Small Business Conference is scheduled for August 9 and 10, 2012 at the Moore Norman Technology Center, located on South Penn Avenue in Oklahoma City. Supported by USDA’s Risk Management Agency, the conference offers a variety of sessions to assist women and producers to successfully manage risk for their families, farms and/or businesses. Sessions topics will include contracts and leases, estate planning, farm bill developments and marketing strategies. Participants choose sessions that meet their needs and develop skills in areas that need strengthening. They will also have an opportunity to learn from speakers that include local and state producers and entrepreneurs, insurance agents, lawyers, and extension educators.

Also available to attendees will be informational booths, mini-mall vendors, breaks and lunches each day, and door prizes. Please call the OSU Department of Agricultural Economics at 405-744-9836 for more information or email Jennifer Jensen, Extension Assistant, at jennifer.jensen@okstate.edu. Check the Oklahoma Women in Agriculture and Small Business Page for a complete listing of events, at www.OKWomenInAgAndSmallBusiness.com. Please plan on attending and bringing a friend or two. We look forward to seeing you there!