SEPTEMBER 2020 | VOLUME 38 | ISSUE 9 A MONTHLY PUBLICATION FROM NOBLE RESEARCH INSTITUTE


Fall Prescribed Fire 6


Fall Cattle Market 8


Cover Crop Grazing Research 9

NOBLE NEWS & VIEWS

75th ANNIVERSARY

Celebrating Ranchers and the Land for 75 Years

by Courtney Leeper, Noble Research Institute writer/copy editor | clleeper@noble.org

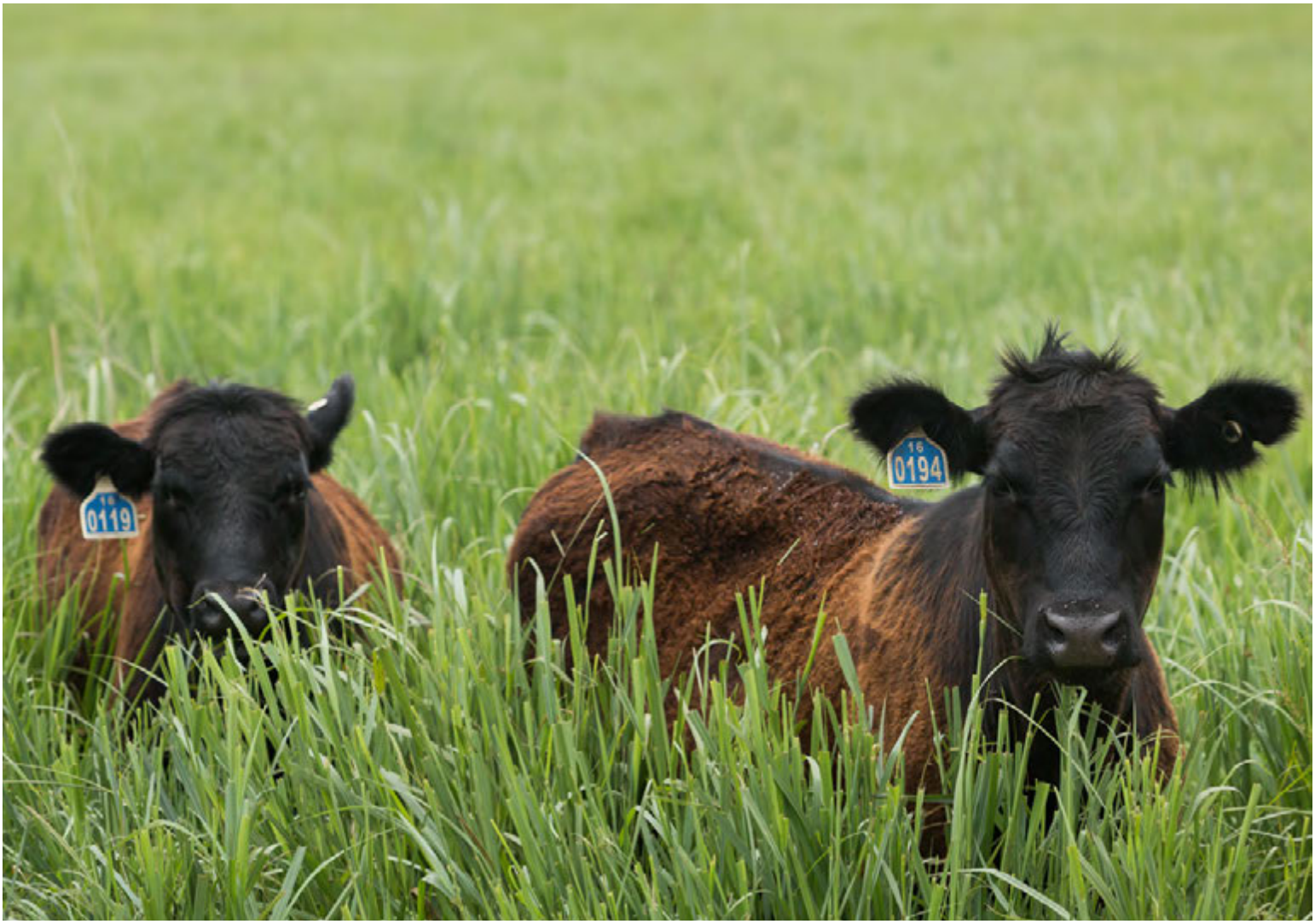
This month, Noble Research Institute will celebrate a major milestone. We will reach 75 years of working with farmers and ranchers on Sept. 19, 2020.

Noble Research Institute was founded as The Samuel Roberts Noble Foundation in 1945 by oilman and philanthropist Lloyd Noble. He was the son of pioneers to the land-rich prairies of what was then Indian Territory. His parents, Samuel and Hattie, and his uncle and aunt, Edward and Eva, farmed and had various businesses in Texas and what is now Oklahoma before settling in the train depot town of Ardmore, Oklahoma, where they started a hardware store the same year Lloyd was born, in 1896.

Noble always had an interest in the land and a respect for farmers and ranchers.

Story continues on page 3

LLOYD NOBLE HELD THE CONVICTION THAT REVITALIZING HIS COMMUNITY MUST START WITH AGRICULTURE, AND MORE SPECIFICALLY WITH REBUILDING THE SOIL.



He once said "it has been my observation that people who are interested in growing things, whether it be flowers, vegetables, major crops, or livestock, are far more kind and considerate mass-wise than any other group," and for that reason, outside of his close family and friends, he always felt most at home with them. In addition, as a teenager, he spent a year alone on his family's ranch, responsible for his own cooking and laundry as well as tending cattle. It was a time of reflection that is said to have impacted him greatly.

The young man had an entrepreneurial spirit and cut his time short at the University of Oklahoma to go into the state's most lucrative new industry — oil — at the age of 24. He quickly became one of the most respected drilling contractors in the U.S., which enabled him to thrive during the Great Depression and Dust Bowl years. He could see, however, that many were not as fortunate. Much of the land was severely eroded, in part because of early practices that stripped the soil of nutrients, such as the continuous planting of cotton. By the 1940s, many farmers were struggling to produce food and make a living from the weakened land. Noble held the conviction that revitalizing his community must start with agriculture, and more specifically with rebuilding the soil. In 1945, he established this organization as a permanent resource to help farmers and ranchers on this journey.

Noble is now 75 years down the road, and we want to honor this history and our roots during our anniversary year. More importantly, we want to turn our attention to the future and celebrate you, the stewards of the land. Most of our activities will be future-focused with several online campaigns that showcase the importance of agriculture and agricultural producers to society. Here's what you may see in the coming year:

- "Thank you" videos to farmers and ranchers from various people across the region and country
- 75 fun facts about beef, grazing lands and cattle production promoted online and in social media
- Noble researchers, consultants and educators showcasing how their work benefits agriculture with the help of an old friend some of you may remember — the blue cow

We invite you to follow us social media (Facebook, Twitter, Instagram and YouTube) to join us in the celebrations. We also hope you will look forward with us to the future as we continue focusing more on regenerative ranching, which is all about restoring degraded soils on grazing lands. Healthier soils translate into more resilient ranching operations and better profitability for you in addition to benefits for society, and we want to be here for you as a resource wherever you are in your land stewardship journey.

"... (W)E WANT TO HONOR OUR HISTORY AND ROOTS DURING OUR ANNIVERSARY YEAR. MORE IMPORTANTLY WE WANT TO TURN OUR ATTENTION TO THE FUTURE AND CELEBRATE YOU, THE STEWARDS OF THE LAND."

I'd like to leave you with a final thought on our aims from a speech our founder Lloyd Noble gave to the Tulsa Farm Club in 1948: "If we can stir people's imagination as to the potentialities of the soil when conserved and built up, then the knowledge they would naturally acquire through these processes should materially contribute to increased confidence in themselves. As it is only when people have confidence or faith that they fight their greatest battles, if we assist them to this end, we will be reaching our objective."

LIVESTOCK ECONOMICS

Stocker Cattle Transitioning to Wheat Pasture May Not Need Supplement

Jon T. Biermacher, Ph.D., Noble Research Institute professor | jtbiermacher@noble.org; B. Wade Brorsen, Ph.D., Oklahoma State University Department of Agriculture Economics Regents professor | wade.brorsen@okstate.edu; Barrett Moore, Oklahoma State University | barrett.moore11@okstate.edu

It is common practice for stocker cattle producers to purchase cattle from sale barns at weaning in the fall, receive and precondition them in drylot environments for approximately 45 days, then grow them out on wheat pasture before sending them to feedyards for fattening prior to final processing. Past research suggests cattle transitioning to wheat pasture from a drylot require an acclimation period before they gain significant body weight. In fact, it has been shown that substantial weight loss often occurs during the drylot-to-pasture adaptation period. Previous research also concludes that weight loss can be decreased by altering the diet in the drylot prior to turning cattle out to wheat pasture. With this finding in mind, it has been hypothesized that providing a transitional diet during the drylot phase and during the first three weeks of wheat pasture can significantly reduce weight loss during the adaptation period.

Story continues on next page

To explore this topic, we conducted a project with two objectives:

- Determine the effect of a transitional diet strategy on stocker heifer average daily gain and total gain during the grazing period.
- Determine whether or not the transitional diet strategies are more profitable than the conventional practice.

DATA AND METHODS

We used a total of 307 stocker heifers in this experiment, all purchased directly from farms and ranches in Oklahoma during the fall of 2015, 2016 and 2017. All heifers received the same preconditioning treatments upon arrival at Noble Research Institute facilities. All heifers were also treated with a standard receiving protocol. They were treated for internal parasites with a dewormer, given a clostridial vaccine and a zeranol implant, and tested for persistent infection upon arrival at Noble's Oswalt Ranch cattle handling facilities in Love County, Oklahoma.

Heifers were randomly assigned to one of six 6-acre preconditioning pastures (two pastures per treatment), stratified by weight. The average starting weight of the heifers in each treatment group was 524 pounds. We used 120 head in 2015 (body weight ± standard deviation = 456 ± 3.94 pounds), 92 head in 2016 (531 ± 8.20 pounds) and 95 head in 2017 (584 ± 8.49 pounds).

Three alternative diet treatments were randomly assigned to animals each year:

- Low-energy diet fed at 1% of animal body weight only during the drylot phase (1%BWDL).
- High energy diet fed at 2% of animal body weight only during the drylot phase (2%BWDL).
- High energy diet fed at 2% of animal body weight during the drylot phase and the first 21 days of the wheat pasture phase (2%BWDLWP).

The 1%BWDL represents a typical (control) diet fed to stocker cattle during the preconditioning phase. All three diets had the same ingredients. The 2015, 2016 and 2017 heifers remained in drylot for 84, 39 and 44 days, respectively. The number of days in the drylot was much greater in 2015 due to the drought that fall. Chute weights were recorded each morning for two consecutive days for each animal at the start and finish of the drylot phase. Once finished with the end phase weighing, cattle were transported on the same day to Noble's Red River Ranch and randomly assigned to one of six wheat forage pastures. Cattle in each pasture had access to water at one of three GrowSafe Beef® individual animal weigh scales. Individual animal daily weights were recorded for the duration of the grazing period.

We used mixed effects analysis of variance (ANOVA) models to test the hypothesis of no statistical difference in average daily gain and total gain between the three alternative diets during the drylot and wheat pasture grazing phases. We also

Story continues on next page

Table 1. Three-year average measures of stocker heifer performance and expected values for revenues, costs and net returns by diet strategy

	Diet Treatments*			
Measures of animal and economic performance:	Low energy drylot only (1%BWDL)	High energy drylot only (2%BWDL)	Transitional drylot and wheat pasture (2%BWDLWP)	P-value
DRYLOT PHASE				
Beginning date	Oct. 10	Oct. 10	Oct. 10	-
Beginning weight (pounds per head)	524	524	524	0.9214
Days on feed in drylot (days)	56	56	56	-
Average daily gain (pounds per head)	1.46[a]	1.90[b]	1.90[b]	0.0325
Total gain (pounds per head)	81.76[a]	106.40[b]	106.40[b]	0.0255
Ending weight in drylot (pounds per head)	605.76[a]	630.40[b]	630.40[b]	0.0365
WHEAT PASTURE PHASE				
Placement date	Dec. 5	Dec. 5	Dec. 5	-
Stocking rate (head per acre)	1.50	1.50	1.50	-
Grazing duration (days)	119	119	119	-
Total accumulated gain on Day 1 (pounds per head)	-28.38[a]	-20.09[b]	-21.83[c]	0.0214
Total accumulated gain on Day 7 (pounds per head)	-16.78[a]	-14.12[b]	-8.56[c]	0.0354
Total accumulated gain on Day 14 (pounds per head)	2.54[a]	3.15[a]	11.33[b]	0.0145
Total accumulated gain on Day 119 (pounds per head)	256.46	258.36	242.06	0.1254
Grazing termination date	April 3	April 3	April 3	-
Final weight (pounds per head)	862.22	888.76	872.46	0.1254
Average daily gain (pounds per head)	2.18	2.18	2.05	0.1963
ECONOMICS				
Total gain in drylot and wheat pasture (pounds per head)	338.22	364.76	348.46	0.1689
Ten-year average value of gain (cost per pound)	0.90	0.90	0.90	-
Revenue (cost per head)	328.28	328.28	328.28	-
Preconditioning costs, excluding feed (cost per head)	39.50	39.50	39.50	-
Seed and seed establishment costs (cost per head)	55.77	57.77	55.77	-
Fertilizer and fertilizer application costs (cost per head)	45.36	45.36	45.36	-
Pesticides and pesticides application costs (cost per head)	18.00	18.00	18.00	-
Feed costs (cost per head)	47.79	98.05	134.3	-
Interest cost on cash operating expenses (cost per head)	2.72	3.41	3.86	-
Interest cost for stocker heifer ownership (cost per head)	20.04	20.04	20.04	-
Total costs (cost per head)	229.17	282.12	316.82	-
Net return (cost per head)	99.11	46.16	11.46	-
Relative difference in net return (cost per head)	-	-52.95	-87.65	-
Relative breakeven cost of feed (cost per head)	-	45.10	46.65	-

* Letters that differ within a row are statistically different at a 95% level of confidence.

used contrast testing to test the hypothesis of no statistically significant differences in accumulated total weight gain during the pasture grazing phase between the three diet treatments at Day 1, Day 7, Day 14 and at the end of the grazing period, which, on average, was Day 119. This is important because the previous literature suggests that the acclimation period between drylot and pasture typically takes place within the first two weeks.

Enterprise budgeting techniques were used along with the parameter estimates obtained from the mixed ANOVA models described above to determine the effect of each diet treatment on the profitability of a typical stocker cattle production system.

RESULTS

Animal Performance

Three-year average measures of stocker cattle heifer performance and expected values for revenues, costs and net returns by diet strategy are reported in Table 1.

Three-year average daily gain across the wheat grazing phase was 2.18, 2.18 and 2.05 pounds per day per head for the 1%BWDL, 2%BWDL and 2%BWDLWP diets, respectively; they were not statistically different, with a 95% level of confidence.

Total accumulated weight gain at the end of Day 1, averaged across all three years, was -28.4, -20.1 and -21.8 pounds per head for the 1%BWDL, 2%BWDL and 2%BWDLWP diets, respectively. These three weights were all statistically different from each other with a 95% level of confidence and are similar to previous research findings.

After one week (Day 7), accumulated gain remained negative for all three diets but were substantially less negative compared to Day 1. By the end of the second week (Day 7), total accumulative weight gain for all three treatments were positive at 2.5, 3.2 and 11.3 pounds per head for the 1%BWDL, 2%BWDL and 2%BWDLWP diets, respectively.

The Day 14 weights for the 1%BWDL and 2%BWDL diets were not different statistically but were both less than the 2%BWDLWP weights with a 95% level of confidence. This result indicates that the transitional diet (2%BWDLWP) did work to improve the loss in weights on Day 1 faster than the other two diets. Unfortunately, this difference did not hold up at the end of the wheat-pasture grazing period.

At the end of that period, total accumulated weight gain was 257, 259 and 242 pounds per head for the 1%BWDL, 2%BWDL and 2%BWDLWP diets, respectively and were not statistically different from each other, with a 95% level of confidence.

Economics

Because the total accumulated gain from both the drylot and the wheat pasture phases between the three diets were not statistically different (P = 0.1689), revenues from the three diets are the same. We calculated revenue for each diet strategy using total gains from the 2%BWDL diet (i.e., 364.76 pounds per head) and the 10 year (2010-2020) average value of gain of $0.90 per pound. This was an arbitrary choice that gave us the greatest revenue between the three gains. We could have just as easily chosen to use the gain from the 1%BWDL (control) diet, which would have given all three systems the smallest revenue. We also included the total list of costs associated with our stocker system, including preconditioning/healthcare, seed and seed establishment, fertilizer and fertilizer application, pest management, feed, and interest on cash operating capital and cash operating capital for purchased stocker cattle. However, you can see from a glance at Table 1 that the only costs that vary between the three diet strategies is the cost of feed and the portion of the interest for operating capital associated with feed. As a result, net return for the 2%BWDL and 2%BWDLWP diets are 52.95 and 87.65 lower than the 1%BWDL (control) diet strategy.

CONCLUSIONS

The results of the mixed ANOVA models, as they pertain to the weight gain of cattle in these two feeding segments, concur with and confirm much of what has already been established by previous research on cattle adapting to wheat pasture. During the drylot phase, cattle that are fed more can be expected to gain more weight. During the pasture phase, weight loss that cattle may experience is expected to occur almost immediately after turnout as they transition to pasture. Because of the individual animal data obtained from the Growsafe Beef units, we were able to show that positive daily gains begin as soon as the third day after transitioning rather than slowly over time as the literature suggests. Although previous work has attributed the change in weight to what is often referred to as a two-week adaptation or transition period, the results of this study indicate that the transition period is much shorter. This information is valuable because it shows producers that the net losses from this adaptation period are relatively small.

Although providing a high-energy supplement to cattle transitioning to pasture affected their weight gain during the first two weeks, the gains were not sustained in the long run. The additional cost of feed in drylot and on pasture were the determining factors for the economics. The most economically sound practice is to not provide any energy supplement with the intent of aiding cattle transitioning to wheat pasture. Hence, we do not recommend providing energy supplementation to aid cattle in adapting to wheat pasture.

RANGE

Consider Using Prescribed Fire in the Fall

by Will Moseley, wildlife and fisheries consultant | wamoseley@noble.org; Russell Stevens, strategic consultant manager and wildlife and range consultant | rlstevens@noble.org

Prescribed burning in the southern Great Plains is typically conducted during the dormant season. Recently, there has been more interest and application of fire during the growing season. These fires are typically conducted in July and August. Extending the burning season into the fall (September through first frost) can help producers accomplish their goals and create opportunities to get a different response from the plant community compared to results from burning in the dormant season and growing season.

GET RID OF BRUSH WITH FALL BURNING

Work conducted by Oklahoma State University has shown that burning during September and October has the most impact on woody plants compared to any other period during the year. If brush management is a goal, fall burning might be the best time to accomplish the objectives of the burn. Keep in mind that fire only top-kills most woody plants. Over time, a well-managed burning and grazing regimen will keep woody plants at bay, especially if the woody plants are small in the beginning. We've found that the more mature and densely spaced woody plants become, prescribed fire and grazing tend to only maintain the current status of the woody plant community.

Story continues on next page

IMPROVE WILDLIFE HABITAT

In addition to woody plant suppression, another major benefit of fall burning is the temporary increase in bare ground and forbs after the burn. For many species of wildlife, bare ground is important for maneuvering and gaining access to food. If the ground is bare through the winter and there is adequate moisture, winter annual forbs will provide a food source where they would be limited without disturbance. The temporary flush of forbs during the following growing season provides a great food source as well as structure for invertebrates that are critical to turkey and quail during the brooding season. This is an excellent way to increase plant diversity and structure on your property for the benefit of livestock and wildlife.

If nesting cover for ground-nesting birds is a concern, burning only a portion of your property leaves adequate nesting cover on the remainder. Over time, if no action is taken, all nesting cover is at risk of being lost. Additionally, a regimen of implementing prescribed fire in the fall or any other time of the year can create or enhance nesting habitat for many ground-nesting birds.

REMEMBER YOU SHOULD NOT BURN THE ENTIRE PROPERTY AT ONE TIME.

CONSIDERATIONS WHEN CONDUCTING FALL BURNS

If you are concerned about bare ground, remember you should not burn the entire property at one time. And, the same piece of ground should not be burned year after year at the same time of year. Although the surface might be relatively bare, root systems are still intact to hold the soil. The amount of bare ground remaining after a fall burn can be controlled by monitoring soil and fuel moisture prior to a burn. Increased soil moisture combined with moisture in the vegetation and high humidity during the burn often results in thatch remaining after a burn.

A major consideration when conducting any prescribed fire is to understand how the area will be managed prior to and after the burn. If an area is needed for livestock grazing soon after the fire, fall burning might not be the best time to burn, especially when there is not adequate soil moisture. There is a very short window of the growing season left to regrow enough grass for livestock forage. However, if the area can be rested until the next growing season, the forage will be higher in quality.

This article is not to add confusion about selecting a time of year to conduct prescribed burns. Instead, it is to liberate fire practitioners to think beyond typical calendar restraints. Apply fire to the landscape and monitor the plant community response. Any time of the year is a good time to burn, and fall might be the best time for you.

LIVESTOCK

2020 Fall Cattle Market Outlook: Hopeful but Be Prepared

by Jason Bradley, agricultural economics consultant | jwbradley@noble.org

I feel like I can safely say that the markets in 2020 have been a little off. It's like we've been on an insane roller coaster ride, with cattle prices going up and down, bouncing around all over the place, leaving us with no option but to hold tight while we ride the markets out. The October feeder cattle contract has traded as high as $157 in January and as low as $113 in April. That's a $350 per head swing in the span of about 12 weeks. Definitely not what we're used to.

PRICES ARE LOOKING HOPEFUL

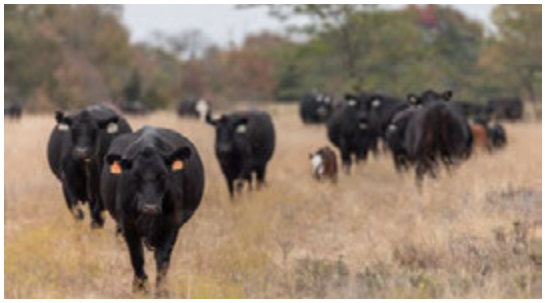
However, where does that leave us today? As of this writing, Aug. 12, 2020, that same October contract was traded at $150, which shows some good news and optimism for fall marketing. So what's causing these higher prices?

SUPPLY

The supply of feeder cattle into the market has remained high due to the backlog of cattle that were ready to head into the feedyards when processor shutdowns started happening. Some of these cattle were held during the summer in hopes that the market would recover once processing started back up. This will result in fewer cattle that would normally have been ready. That scenario seems to have played out, with processors back up and running, moving those cattle through the supply chain.

WEATHER

The drought monitor is showing drier conditions for many parts of the Southwest as we continue through the year (you can find the latest outlooks for drought at https://droughtmonitor.unl.edu/ConditionsOutlooks/Outlooks.aspx). These drier conditions may become more influential as we head into winter.



DEMAND

As feeders moved through their inventory that came in this spring, the cattle that were held by producers have run the supply a little short, driving up demand for feeder cattle in the yards.

FEED PRICES

Current estimates are pointing toward record yields for corn and soybeans. This will help in the feedyards as it will help pull feeding costs lower, allowing for better cattle prices.

So there is hope. The markets have come up, the feed supply is looking strong, and there is potential for demand for cattle from the feedyard. But in a year where we've been a little off — I mean way off — it's hard to have any real certainty of what's to come. What are consumers going to be doing? What is the government going to put into effect? How is our ability to trade going to look? What does the coronavirus look like in the coming months?

BEST ADVICE FOR UNCERTAINTY

It is difficult to know what to expect for future markets, but you can still be prepared to make the most of your situation.

The best advice I can give you right now is to:

- Know your breakevens.
- Know your cost of gain on your calves.
- Look at what the market is offering and when.
- Consider some risk management.

RESEARCH

Cover Crop Grazing Research Leads to Ideas for Future Research

by James Rogers, Ph.D., associate professor, forage systems | jkrogers@noble.org

The challenge with doing applied research is you cannot answer all of the questions that you may have in a single study without confounding the results. Often, after you begin a study, you realize there are things you should have done differently or that what you thought would be a result winds up being something totally different. Such is the case with the summer cover crop/winter pasture grazing study we wrapped up this year.

This study created a very large data set that we are currently working to get fully analyzed. When the results of the study are finalized, I will share them with you in *Noble News and Views*. For now, the following is a discussion based on our observations from the study that may lead to future work or provide food for thought for folks currently using cover crops or thinking about incorporating them in the future.

SUMMER COVER CROPS AND TILLAGE STUDY

The main objective of the study was to evaluate how the addition of a summer cover crop affects the subsequent winter pasture production in either a tillage or no-tillage system.

Let's begin our discussion with the cover crop. We started with a diverse mixture of three types of millet, grazing corn, soybean, cowpea, buckwheat and sunn hemp. Out of this mixture only the pearl millet, cowpea and sunn hemp persisted and contributed to yield and grazing. After two years, we simplified the mixture to include pearl millet, cowpea and okra. Sunn hemp was performing well and providing a lot of biomass but was not contributing much to grazing, so it was replaced with okra. The okra has performed well, providing some grazing and a deep tap root. Animal performance has been good on both mixtures, with cattle gaining close to 2 pounds per day.

Story continues on next page

LESSONS LEARNED AND THOUGHTS FOR THE FUTURE

KNOW YOUR ENVIRONMENT AND GOALS
It is important when choosing a summer cover crop to consider what crop will work in your environment, what the cost is and what you want the cover crop to do.

DEALING WITH WEEDS
Looking back, if we did not control volunteer plant growth with either tillage or herbicide, we would have had good volunteer ground cover during the summer. The problem is that volunteer ground cover may not always be desirable. In no-till, our volunteer cover crop was summer annual grasses that were grazeable. However, in the tillage system, our volunteer cover crop was pigweed. Though pigweed generally isn't desirable, it might raise an opportunity for multi-species grazing by adding goats to suppress the pigweed.

EVALUATING VERTICAL TILLAGE
Soil movement was a big issue in our tillage treatments. Our primary tillage tool was a heavy offset disk used two to three times behind the cover crop to get the ground ready for winter pasture or used several times in fallow areas during the summer in an attempt to keep pigweeds controlled. A way to describe an offset disk is a "big soil fluff-upper" that leaves the soil loose, fluffy and vulnerable to movement from wind and water. Several new tillage tools are now available that can create a seedbed without the extreme disturbance created by a disk. One such tool is the vertical tillage tool. While I am a strong advocate of no-till, it would be interesting to evaluate a vertical tillage instrument in future work.

ROLLER CRIMPER POSSIBILITIES
Another tool that has gotten a lot of interest in the world of cover crops is the roller crimper. The idea being that it can be used to terminate cover crops in no-till without using herbicides. A lot of the application for the roller crimper has been to terminate cool-season crops, such as annual rye. Evaluating roller crimper use for termination of summer annual crops and weed control in a system is on my research to-do list.

ROTATING COVER CROPS
Crop rotation is an often overlooked but valuable practice that we need additional data on in stocker cattle systems. In our study, we used wheat or triticale as our winter pasture and multispecies cover crops during the summer. In future work, evaluation of summer cover crop rotations and adding diversity to our winter pasture crop should be evaluated. Can short-lived perennials be incorporated into these systems in a cost effective manner? What kind of outside-the-box thinking should we be evaluating in traditional production systems?

GRAZING BETTER ON COVERS
This was a grazing study where we were using cattle to harvest the winter pasture and summer cover crops. In the winter pasture part of the system, cattle grazing went well with cattle going on in the fall and coming off in the spring. Summer cover crop grazing was challenging. The window of time is short in order to get a crop in and have it develop to the point that it can be grazed prior to planting the next winter pasture crop. This limited our grazing time to about 40 days on average. When we put the study together, we looked at a set of calves that would graze winter pasture before being sold then another set of calves that would graze the cover crops. Because of the limited grazing days on the cover crops, the calves did not have enough grazing time to pay for the cost of the cover crop. However, there are many more options of grazing that need to be evaluated. Instead of looking at the cover crop and winter pasture as two separate grazing systems, future work needs to focus on them as being one system. For example, millet and cowpea can produce a lot of forage from September to frost. Are there opportunities to receive cattle on a summer cover crop and graze until winter pasture becomes available? The same is true in the spring. Are there opportunities to finish cattle on summer cover crops or to continue growing stocker cattle past winter pasture graze-out?

We gained a tremendous amount of knowledge during the course of this study, but there is still a lot of work to be done and questions to be answered. Crop rotation, crop species, economics, grazing options and soil health all are just a few of the ongoing work here at Noble Research Institute.

NOBLE NEWS&VIEWS

IN THIS ISSUE

UNLOCK YOUR NEW NOBLE ACCOUNT

GO TO WWW.NOBLE.ORG/MYACCOUNT

You'll need this account to sign up for events and to let us know your interests and communication preferences.

Noble News and Views is published monthly by the Noble Research Institute. Current and past editions of *Noble News and Views* are available at www.noble.org/news-and-views.

Free subscriptions delivered by email are available at www.noble.org/subscriptions. The Noble Research Institute encourages the republication of *Noble News and Views* articles. For publication guidelines, contact J. Adam Calaway, director of communications and public relations, at jacalaway@noble.org. High quality electronic versions of photos and graphics are available.

CHECK NOBLE.ORG FOR EVENT CANCELLATIONS

All educational events will move to live online learning for the remainder of 2020. Please check here for the latest information on times and dates. Please check www.noble.org/events for the most current information.

There is growing demand for pecans as more people are discovering the many health benefits of this native nut. Pecan culture presents unique management challenges, not to mention the need for specialized equipment. Join Noble Research Institute horticulturists as they review the various production and management practices.

6:30-8:30 p.m. CDT
Online
No Registration Fee

So You Want to Grow Fruit

6:30-8:30 p.m. CDT
Online
Registration Fee: $20

So You Want to Grow Vegetables

6:30-8:30 p.m. CDT
Online
Registration Fee: $20

6:30-8:30 p.m. CDT
Online
No Registration

Knowing the steps to take when establishing an orchard will greatly increase your success. This course will cover all of the necessary details to prepare you to start your own pecan orchard.