EXTENSION

Ag Insights

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Starting Off Right with Grain Sorghum

Josh Bushong, West Area Extension Crops Specialist

As with any crop, getting started off right can often mean the difference between raising a successful crop or coming up a little short of expectations. Planning for either full season or even double cropping sorghum should be happening now. In order to get the crop off to a good start, farmers will need to determine which hybrid to plant, how to plant it, fertility recommendations, and how to economically control pests.

Hybrid selection is more important than ever. Besides the obvious selection factors like yield potential and maturity, sorghum aphid (formerly known as the sugarcane aphid, SCA) tolerance has become one of the top selection factors in recent years. These hybrids are not truly resistant in the sense that SCA can still infest the crop, but these hybrids tolerate the SCA, and grain yields are not significantly reduced. SCA can still be found in these hybrids, but often don't multiply as fast. Insecticides should be applied when SCA reach economic thresholds regardless of hybrid used.

Planting early with a tolerant hybrid will reduce the risk of needing an insecticide applied, or at least maybe get by with one application of the insecticide Silvanto Prime or Transform WG instead of multiple applications. Economic thresholds for SCA are 20% plants infested with a SCA colony at the pre-boot and boot growth stage and 30% after the heading stage. After the crop gets past the dough stage, SCA will not likely reduce yield, but the honeydew produced can still cause harvest issue.

There are now three herbicide-tolerant traits available in grain sorghum. These grass controlling technologies include igrowth, Double Team, and Inzen. The igrowth technology uses Advanta bred hybrids and the herbicide Imifex from UPL. The Double Team Sorghum Cropping Solution uses S&W Seed Co.-bred hybrids and the herbicide FirstAct from ADAMA US. The Inzen trait uses Pioneer brand hybrids and the herbicide Zest WDG from Corteva. Both Imiflex and Zest WDG are Group 2 herbicides FirstAct is a Group 1 herbicide.

Using pre-emergent herbicides in combination with Atrizine is often needed even if using an herbicide-tolerant sorghum hybrid. Group 15 herbicides are strongly recommended for many grassy and small seeded broadleaf weeds. Treating seed with a seed safener, such as Concept or Screen, is needed to prevent crop injury from this group of herbicides. Group 15 herbicides contain active ingredients such as metolachlor or S-metolachlor (i.e. Bicept and Dual), acetochlor (i.e. Warrant), and dimethenamid (i.e. Outlook).

Sorghum can be seeded with either a planter or grain drill. Row crop planters on 30" row spacings are often preferred. If utilizing a grain drill, many producers find it easier to control plant populations when closing off every other row. Some of the newer hybrids often perform better when plant populations are thick enough to prevent the need for plants to develop tillers. A planting population of about 45,000 seeds per acre is recommended.

Fertility management can easily limit yield potential if not managed correctly. Obtaining a soil sample will help assist in proper nitrogen, phosphorus, and potassium recommendations. Sorghum performs best between a soil pH of 5.5 to 7.0 and needs about 1.2 pounds of nitrogen per bushel of yield.

Planting is often referred to as "the most important pass" with many crops and grain sorghum is no exception. Take action now to get the right hybrid planted on time into a weed free seedbed with proper soil fertility and the rest of the crop year will go much more smoothly. A nice thick even stand will assist in preventing weed emergence by reaching canopy closure faster, create a higher tolerance to pest infestations, and provide a more even maturity at harvest.

Don't Hedge Your Bets on Upcoming Spring Green-up

Dana Zook, West Area Extension Livestock Specialist

January and February are the toughest months for cows. Standing forage quality is waning, cold temperatures are common, and spring calving herds are nearing calving time. Amidst the winter weather and calving preparation, it's easy to overlook increased nutritional needs for lactation. Last month I discussed increased nutritional requirements for cold weather but this month I thought it timely to mention lactation.

So, what should we monitor? And how can we estimate what cows need? Body condition is key. Our body condition guidelines say that cows should calve in a body condition score of five, and first calf heifers should calve in a body condition score six. In general, a cow in a body condition score five is moderately thin, having no excess fat in the brisket or around the tail head. The loin edge to the backbone should be smooth and only the last two ribs should be showing. A cow in a body condition score 6 will

have an overall smoother appearance, slightly more fat in the brisket and around tail head with very little rib showing.

Take a look at your herd as a whole and evaluate body condition. Doing this evaluation before calving is the best because it gives time to add condition before nutritional requirements skyrocket after calving. If you are behind the ball, don't fear! Evaluate body condition at calving and see where change should be made. To add body condition during lactation is like pushing a boulder uphill but even if the positive change is slight, breeding rates will be much better than if cows are losing condition.

Evaluate manure. Yes, you read that right! This can be a visual to evaluate the full nutritional profile for cows and is a very valuable tool in the winter. Walk through your herd and put your eyes to the ground. Manure pats are scored on a scale from 1 to 5; 1 being very runny to 5 stacking up on itself and showing clear fibrous components. A manure score of 3 is what we are looking for in cows; this would be a manure pat that is a smooth stack a few inches high, has no folds and with little fiber visible. This shows cows are getting what they need. We are all familiar with those manure stacks that are 4-5 inches tall that we trip over when trying to move cows this time of year; these would be a manure score 5. Cows producing stools of this type should be provided a good protein source and a high-quality hay source. One mistake that can occur this time of year is providing a protein source without bothering to consider the hay/forage source. Often, a good quality hay with a small amount of supplemental protein can bring nutrition to the appropriate level this time of year.

Many producers are hopeful the drought will be over this spring. I am also hopeful, but we must be realistic. Yes, "green-up" may occur in March, but our grasslands are in dire need of some recovery time. I say all this to help producers realize we are at least 60-90 days from any real grazing opportunities on our grasslands. If grasses are nubbed to the ground before they get time to grow, summer grazing will be damaged. Some lucky producers may have some small grains pasture but most need to think long term. For this reason, it is NOT too late to get a forage sample analyzed. Contact your extension educator to get their opinion on your forage resources for the remaining winter period. Realistically, we are headed into the most important supplemental period of the year. Drought and high feed prices are stacked against producers, and this is not a year for guessing.

Carbon Markets and Agriculture

Trent Milacek, West Area Extension Ag Econ Specialist

The push for carbon neutrality by governments and companies has created a need for the creation of carbon credits and offsets. Agriculture is seen as an avenue for the biological sequestration of carbon by paying for practice changes that will increase the amount of carbon stored in plant material and the soil. Producers may be positioned to take advantage of this opportunity, but there are many concerns to understand and prepare for.

The need for carbon credits stems from the desire to reach net zero carbon emissions. Consumers are becoming more aware of their environmental footprint and are willing to reduce their carbon impact. They are more likely to shop with companies who are carbon neutral or have plans to be in the near future. This behavior creates the demand for carbon credits.

There are various targets globally as well, with the US setting the goal of carbon neutral emissions by 2050. This can be achieved by production and manufacturing changes along with geological carbon sequestration, but also by biological sequestration through plant growth. Countries can also trade carbon credits with each other in order to meet their goals.

It is typically difficult for corporations and companies to change the production practices of their businesses to reduce carbon emissions. There are also concerns about the cumulative carbon footprint related to manufacturing. Products sourced from other countries may not carry an obvious carbon footprint value and determining the scope of the total carbon footprint of the energy, parts and labor inputs required for manufacturing can be very complicated.

There are many players involved in this endeavor. Producers willing to change production practices, for example conventional-till to no-till, can be paid by integrators for their production changes. Integrators are important because they gather carbon credits into large pools that can be effectively marketed to industry. However, the more players in the market reduces the total monetary value available to producers. Integrators set up the contracts and hold carbon credit buffers in order to account for producer practice changes and carbon leakage back into the atmosphere.

The American Society of Agronomy states that “A sustainable agriculture is one that, over the long term, enhances the environmental quality and the resource base on which agriculture depends; provides for basic human food and fiber needs; is economically viable; and enhances the quality of life for farmers and society as a whole”. This general idea with definitions provided by other organizations that are similar but somewhat different from the above, drive the acceptance of production practice changes that are accepted by purchasers of carbon credits.

How much money is available to producers? This is a partial budgeting question and the only value that a producer can capture is the net value after practice adoption. Meaning that we must account for the extra cost of adopting a reduced tillage practice. This is the point where some can feel slighted. These contracts are seeking production practice change. Established no-till farms do not always qualify. There may be provisions to pay for production practices adopted in the last 12 years, but that is the longest known to date and typically contracts are for practice changes in the last 4 years and forward.

Typical payment rates are \$10-\$20/MT of CO_2E sequestered. Practice changes vary widely in their ability to sequester new carbon. For example, the adoption of a cover crop system can sequester 0.14 MT of CO_2E/acre in the western Oklahoma and Texas Panhandle environment. The payment then would be \$20 multiplied by 0.14 totaling \$2.80/acre. This does not pay for a cover crop practice adoption on its own. Payments will have to be increased for local adoption or programs will need to be stacked. There are many different examples that can be calculated but few come close to being profitable at the current time.

There are also concerns about a producer selling their carbon sequestration potential. There could come a time when agriculture is under the same scrutiny for emissions that other industries are. If farmers sell off carbon credits on contracts that can last 10-20 years, they give up the ownership to those offsets. For producers engaged in cattle feeding or other additive production practices, there could come a time when they need their own carbon sequestration potential to offset the carbon emissions of their own business. It would be unfortunate if they needed to purchase back carbon credits that they previously sold for a higher price in this hypothetical scenario.

There is little actually known and many questions regarding carbon credits. Land grant universities are engaged in research and the picture becomes clearer every day. Early adopters may find a way to be profitable selling carbon credits, but agriculture’s total carbon offset potential is relatively finite, and a fixed resource becomes more valuable as demand for it increases.

Time to Evaluate Beef Cow Herd Breeding Potential

Britt Hicks, Ph.D., PAS Texas County Ag Educator & Area Extension Livestock Specialist

With spring calving approaching, now would be good time to evaluate the breeding potential of your cows. Research has shown that the body condition score (BCS) of beef cows at the time of calving has a huge impact on subsequent rebreeding performance. Body condition scoring is a practical management tool to allow beef producers to distinguish differences in nutritional needs of beef cows in the herd. Simply put, BCS estimates the energy status (fat cover) of cows. The scoring system used is a 1 to 9 point scale where a BCS 1 cow is extremely thin while a BCS 9 cow is extremely fat and obese. A BCS 5 cow is in average flesh or body condition. A change of 1 BCS is equivalent to about 90 lb. of body weight. To optimize pregnancy rates, mature cows should have BCS of 5 or greater at calving and 1st calf heifers should have a BCS of at least 6 at calving.

Research has shown that the BCS of beef cows at the time of calving has a huge impact on subsequent rebreeding performance. This occurs because the BCS of a cow influences days to first estrus after calving and calving interval. For a cow to maintain a 365 day calving interval, she must conceive within about 82 days after calving (283 day gestation + 82 day postpartum interval = 365 days). Figure 1 illustrates that 90% of the beef cows with BCS >5 at calving showed signs of estrus by 60 days post-calving, whereas only 59% of beef cows with BCS 4, and only 41% of beef cows with BCS <3 showed estrus. The rectangular box in this figure shows the critical breeding time in order to achieve a 365-day calving interval. Even though cows that calve in a BCS of 7 have a short postpartum interval, it is not economical to feed cows to a BCS of 7.

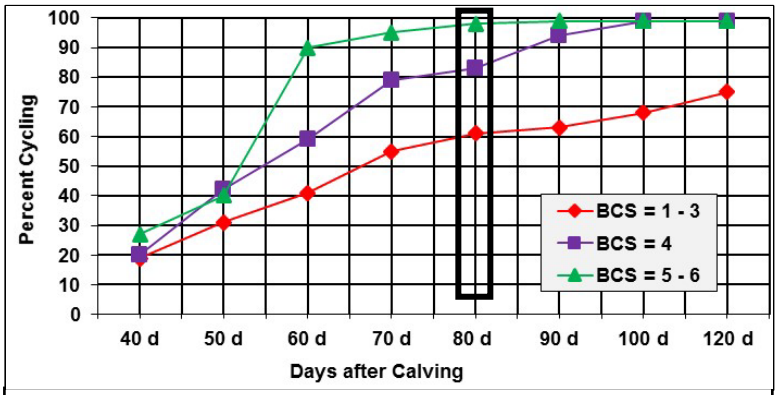
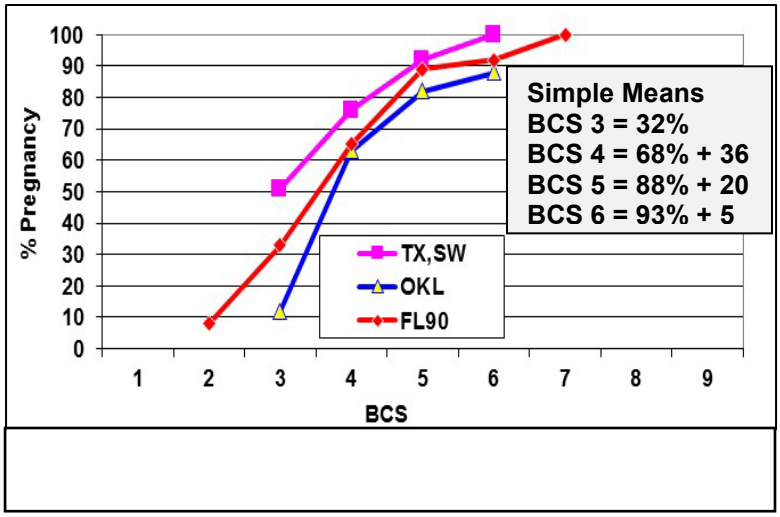


Figure 1. Body Condition Score at Calving and Return to Cycling (Adapted from Wiltbank., 1983).

Research (Figure 2) suggest that increasing calving BCS from 3 to 4 would increase pregnancy rate by about 35 percentage points (from 32 to 68%). Increasing calving BCS from a 4 to a 5 would increase pregnancy rates by about 20 percentage points (from 68 to 88%). Note this same effect of BCS at calving on pregnancy rates has been observed in different regions of the country (Florida, Oklahoma, and Texas).



In addition, thin cows at calving (BCS 4 or thinner) produce less colostrum, give birth to less vigorous calves that are slower to stand and these calves have lower immunoglobulin levels, thus reducing their ability to overcome early calf-hood disease challenges. All of these data illustrate the importance of targeting mature cows to calve in a BCS of at least 5. Since 1st-calf-heifers have only reached about 85% of their mature weight after calving and require additional nutrients to support growth, it is recommended that they be fed so they are a BCS of 6 at calving.

If your cows currently have inadequate condition, there is still some time to change the BCS prior to calving. Manage your mature cows for a BCS of 5+ at calving. If the cows are in BCS of 5 at calving, a slow gradual weight loss after calving is acceptable. Whereas, if the cows are less than BCS 5 at calving then one needs to hold or increase BCS (weight gain) after calving. However, increasing BCS from calving until breeding will be difficult and costly since cows are lactating.

Raising the Orphaned Calf

Rosslyn Biggs, DVM, Beef Cattle Extension Specialist/Director Continuing Education/Clinical Assistant Professor Veterinary Clinical Sciences

Even with the best care and management, it is not uncommon for beef producers to find themselves with an orphaned calf. There are many factors that can contribute to a calf being orphaned, such as weather conditions, dystocia, twins and individual cow accidents or illness unrelated to birth. Although it is possible to graft an orphan to another available cow, this option is not always available.

Raising a beef calf on a bottle or a bucket can be time consuming and may require additional expense. Additionally, managing a calf's health and nutrition can present

challenges if the calf was not thriving at the time it was orphaned. This article contains considerations for the producer when creating a plan for raising an orphaned calf.

Nutrition

Age has significant influence on the nutritional considerations for an orphaned calf. High-quality colostrum should be fed to calves that lose their dams at less than 24 hours of age. Ongoing research supports early colostrum administration is best if delivered by four hours of age. After six hours of age, the calf's intestine begins to lose the ability to adequately absorb colostral components. Virtually no intestinal absorption of antibodies occurs after 24 hours of age. Producers should not wait to administer colostrum if there is evidence the calf has not nursed.

Beyond the first day of life, calves need 10-12% of their body weight in milk per day. A good rule of thumb is that one gallon of milk equals eight pounds. The total quantity of milk should be divided into multiple feedings with a minimum of two feedings. Feeding from a bottle or bucket are both options, however, nursing from a bottle closely mimics the nursing of the udder. It is often easier to start a calf on bottle.

The best option for feeding will most often be in the form of a milk replacer. The quality of a milk replacer is critical, and the calf should be consistently fed with the same brand. Milk replacers should, at minimum, be at least 15% fat and 22% protein. Milk should be at 101-105 degrees Fahrenheit when fed.

Within the first week after birth, offer a calf starter ration of pellets or other creep feed along with high quality hay. Offering very small amounts and refreshing when stale is important initially as the calf will not consume very much, but early rumen development is reliant on ingestion of dry hay and feed. Once the calf is beginning to consume one-half to two pounds of dry feed daily, slow bottle weaning can be initiated. Unlike in dairy calves, the best results are seen if a beef calf is fed milk for several months. Calves should be transitioned slowly and should be eating 2-3% of their body weight by eight weeks of age. At this point, the calf's weight should have doubled since birth.

Additionally, calves will not consume enough milk to maintain their hydration status. Fresh clean water should always be available. Water buckets, bottles and feed pans should be regularly cleaned and sanitized to prevent disease.

Temperature

Tracking and maintaining calf temperature is important when managing orphans. Calves, especially newborns, do not have the ability to easily maintain their core temperatures. Inexpensive digital thermometers can be used to determine calf rectal temperature. Environmental conditions, such as wind and outside temperatures below

50 degrees Fahrenheit, may lead to cold stress. Calves may need to be taken indoors for rewarming and fluids if their temperature drops below 99 degrees, especially in the winter. Calf jackets are regularly used by the dairy industry to maintain calf temperatures. Bedding can also help maintain calf temperature. Deep bedding such as straw should be available and regularly refreshed. Housing should be well-ventilated, clean and dry.

Health

Monitoring the health of orphaned calves should occur at every feeding if not more often. Fever, decreased appetite, coughing and diarrhea can all be clinical signs of concern. Producers should work with their veterinarians in advance to develop treatment plans for commonly seen conditions in bottle or bucket calves. Medications used in these treatment plans, such as electrolytes, antibiotics and anti-inflammatories, are good to have on hand.

Extension Experience – Insights into Oklahoma Agriculture

The Northwest Area Extension Staff would like to announce the creation of our new podcast *Extension Experience.* The *Extension Experience* podcast is brought to you by Josh Bushong, Trent Milacek, and Dana Zook. Each week they provide perspective on Agriculture topics and offer insight from our experience working with Extension Educators and Producers across Oklahoma.

The *Extension Experience* podcast is available on Spotify, Google Podcasts, and Apple Podcast platforms. You can also access the episodes on spotlight, http://spotlight.okstate.edu/experience/.

We hope you consider listening to Extension Experience.