K-STATE Research and Extension

Beef Tips

May 2013 Department of Animal Sciences & Industry www.asi.ksu.edu/beeftips

Upcoming Events

Cattle Feeders College
May 9, 2013
Scott City, KS
620-275-9164
Details on pg. 6

Beef Improvement Federation Convention
June 12-15, 2013
Oklahoma City, OK
www.beefimprovement.org

DNA Technology & Feed Efficiency
June 26, 2013
Clay Center, NE
www.beefefficiency.org

K-State Beef Conference
August 6, 2013
multiple locations see
www.KSUbeef.org

Contributors

Dale Blasi
Stocker, Forages Nutrition & Mgt.
785-532-5427
dblasi@ksu.edu

Joel DeRouchey
Environmental Management
785-532-2280
jderouch@ksu.edu

Jaymelynn Farney
Beef Systems Specialist
620-421-4826
jkj@ksu.edu

Larry Hollis
Extension Beef Veterinarian
785-532-1246
lhollis@ksu.edu

Sandy Johnson, Editor
Livestock Production
785-462-6281
sandyj@ksu.edu

Chris Reinhardt
Extension Feedlot Specialist
785-532-1672
cdr3@ksu.edu

Justin Waggoner
Beef Systems Specialist
620-275-9164
jwaggon@ksu.edu

Bob Weaber
Cow/Calf Specialist
785-532-1460
bweaber@ksu.edu

May- June precipitation provides early indicator of pasture yield and animal performance

Keith Harmoney, rangeland scientist, John Jaeger, beef scientist

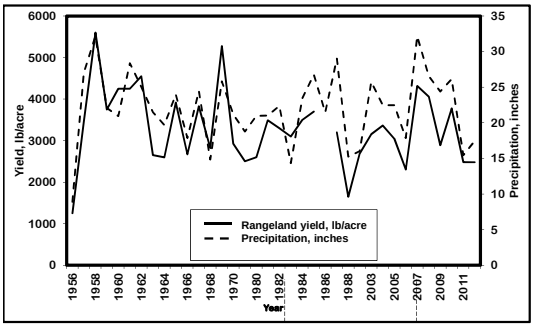
Recent drought conditions have raised a number of concerns;

- having enough rangeland forage production to sustain animals for the current grazing season,
- having enough forage for winter stockpiling,
- gaining enough animal weight during the summer on drought stressed forage,
- producing enough forage the next growing season after the drought to sustain herd size.

Available soil water from precipitation is the main limiting factor to total forage production in most regions. Other factors, such as prior grazing history (stocking rate) and time of year in which grazing took place, also can affect forage production in future growing seasons.

During drought periods, it would be beneficial to know the amount of pasture production that could be expected from decreasing amounts of precipitation so that producers can make informed stocking decisions. Shortgrass rangelands at the Kansas State University Ag Research Center – Hays near Hays, KS, have been used for grazing research since the 1940's. For studies with similar stocking rates, rangeland production was compared to annual precipitation and specific monthly combinations of precipitation for 36 years of data to find the best relationships between the times of year precipitation is received and end of the growing season forage production. Year analyzed, forage production, and precipitation each year are depicted in Figure 1.

Fig. 1. Thirty-six years of rangeland yield data and annual precipitation from October of the previous year through September of the current year at Hays, KS. Vertical dashed lines indicate years of new grazing studies from which vegetative production and precipitation data were collected



The time period of precipitation with the greatest relationship to end of growing season forage production was precipitation from October of the previous year (**OctPY**) through September of the current year (r^2=0.61). Late fall precipitation of the prior year and winter precipitation promote early cool-season grass growth, namely western wheatgrass and annual bromes. The OctPY through September time period also includes precipitation that would fall during the main growing period of the dominant forage in the shortgrass rangeland system, namely warm-season grasses. The two month period that had the greatest relationship with end of season forage production was May and June precipitation (r^2=0.56, Figure 2). This two month period represents the most rapid growth period of warm-season grasses in western Kansas, and therefore precipitation during this time period can reasonably be a predictor of end of season forage production.

continued...see Precipitation on page 6

Sunflower Supreme Heifer Program initiated in southeast Kansas

Jaymelynn Farney, beef systems specialist

"Heifers that breed earlier in their first breeding season have greater lifetime production."

With the reduction in total cow numbers in the United States, when the drought breaks, there will be a need for quality replacement females to re-populate those herds that had to be dispersed. Kansas cattle producers can be at the fore-front of this effort by participating in a new southeast Kansas program to improve replacement heifer development and potentially capture added value. Properly developed bred replacement females have the potential to add value to the herds in which they are retained and also to be a source of additional income if sold.

The Sunflower Supreme heifer program is a joint effort of K-State Research and Extension and the Kansas Department of Agriculture with the stated mission to provide education and guidance to cattle producers about the best management practices for replacement heifer development. The procedures identified in the program are research based and can be incorporated into any beef cow-calf operation. The areas of educational focus are: decreased dystocia, improved longevity, whole herd health programs, and improved reproductive performance. The program is loosely modeled after the Missouri Show-Me-Select Replacement Heifer Program.

Calving difficulty in 2-yr-old heifers has been reported to be three to four times as high as in 3-yr-olds, and calving difficulty decreases with cow age. First-calf heifers experiencing calving difficulty produced fewer weaned calves at first and second calvings than those with easy calvings. Fewer cows requiring assistance at calving were in estrus and became pregnant (69% vs 85%) during a 45-day A.I. period compared to cows with no calving difficulty in a Nebraska study. A shorter duration of labor resulted in more dams exhibiting estrus at the beginning of the breeding season and higher pregnancy rate in a separate study at the Livestock and Range Research Laboratory (Miles City, MT). When dystocia results in a caesarian section, cows are at a much greater risk of being culled due to failure to re-breed.

The most reliable method to reduce dystocia is the utilization of calving ease (CE) expected progeny differences (EPDs) in selection of service sires. The calving ease EPD is calculated using calving ease scores from the progeny of 2-year-old females and birth weight data from progeny born to dams of any age. The calving ease EPD is a measure of percentage of unassisted births and provides a simple, yet very effective tool to reduce dystocia concerns. All heifers in the Sunflower Supreme program must to be bred to bulls which meet or exceed guidelines for calving ease EPD. In the event that Calving Ease EPD is not offered by a breed then guidelines for birth weight EPD will be used.

The Sunflower Supreme program is designed to improve relationships with veterinarians to build a whole herd health management program to achieve the animal health objectives. The program focuses on respiratory and reproductive health. The program vaccination guidelines can be adapted to any operation with guidance from their veterinarian. Additionally, this program will require producers to be Beef Quality Assurance (BQA) certified before administering weaning vaccinations. This training will help producers understand and implement the best management practices related to animal handling/stockmanship, vaccination and treatment protocols, drug withdrawl, and record keeping.

Producers are encouraged, where appropriate, to adopt reproductive management tools such as estrus synchronization and artificial insemination to achieve a number of program goals. Breeders using natural service breeding systems are eligible to participate in the program. This program encourages a 60-day breeding season for all heifers enrolled. Heifers that breed earlier in their first breeding season have greater lifetime production. Pre-breeding exams for both replacement females and bulls are recommended 45 to 60 days prior to breeding. All bulls should have a breeding soundness exam. Heifers should be weighed, body condition scored, and have reproductive tract exams completed well ahead of breeding so that the information collected can be utilized in selection and management decisions.

The Sunflower Supreme Heifer Program will be a great educational opportunity for producers and hopefully expansion of this program will occur to include the entire state within a couple of years. However, all the guidelines for this program can be adopted in any operation. For those who are interested in the specifics of the program, there will be several informational meetings held at various locations around southeast Kansas later this summer and fall. Specific questions about the program can be sent to Jaymelynn Farney jkj@ksu.edu, Delta George delta@ksu.edu, or Keith Martin rkmartin@ksu.edu.

Observe estrus in cow herd to monitor bull fertility during breeding season

Bob Weaber, cow-calf specialist

All too often when producers and specialists talk about 'fertility' we gravitate to a discussion of reproductive failure in cows and subsequent culling or management strategies. It is, however, important to recognize the importance of bull fertility as well, especially in commercial operations that rely heavily on natural service sires. With the increased cost of bulls, it is tempting to stretch the bull to cow ratio. This strategy may decrease the breeding cost per pregnancy but it may also put your herd's reproductive rate at greater risk.

The risks of male reproductive failure tend to increase following nutritional or environmental insults to the bull. Environmental conditions such as drought or extended winter and cold temperatures can not only adversely affect body condition score and fertility in cows, they can take their toll on bull fertility as well. The wide range of precipitation and temperatures experienced recently should cause us to pause and consider strategies to assure a successful breeding season.

It is always a good idea to have a breeding soundness exam performed on bulls prior to turn out to identify infertile and sub-fertile bulls. However, a bull with satisfactory breeding potential before the season starts may not stay that way. In multi-sire breeding pastures, injuries are fairly common causing either injury to feet and legs or the reproductive tract, disrupting the libido and serving capacity of the bull. Fertility issues can and do present themselves in otherwise healthy and fit appearing bulls. Some of the fertility problems are associated with a range of venereal diseases including Trichomoniasis (a protozoan disease) which causes early embryonic losses in cows bred by infected bulls. (see sidebar map for affected counties and January 2012 Beef Tips for more information on Trich). Other causes are less specific and hard to diagnose but result in delayed rebreeding and or low pregnancy rates.

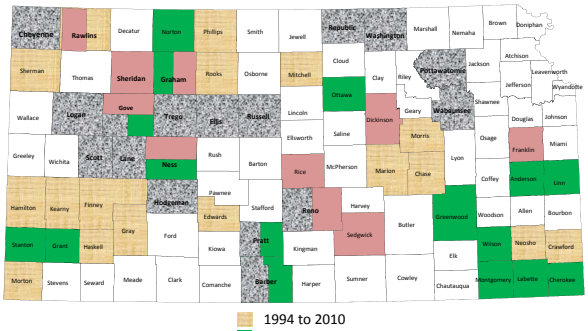
The value of a tight calving distribution is often measured in the weight advantage of older calves at weaning. A tight breeding season is a good sign of the success of nutrition and management decisions. If you still have a large percentage of cows calving in the last 30 days of a 90 day breeding season an investigation into the cause is warranted.

Producers are advised to periodically monitor estrous behavior (heat) in their cowherd to see if the service sires are settling cows. At the beginning of the breeding season, most of the cows should be at least 30 to 45 days postpartum and beginning to show estrous behavior. If all cows in a group have resumed normal estrous cycles then about 5 percent of the cows should be in estrus each day. Over the first 42 days of the breeding season nearly all the cows should exhibit estrus and be bred at least once. A percentage of these cows will not conceive and will return to estrus. If we assume that 80 percent of the cows bred during the first 42 days of the breeding season conceive, then 20 percent of these should return to estrus. During the middle and latter parts of the breeding season, approximately one percent or fewer of the cows should cycle each day. If after 45 days of the breeding season you still have three to five percent of the cows cycling each day action is needed; either pull bulls for a breeding soundness exam to confirm fertility and/or replace these bulls with bulls known to have recently passed a breeding soundness exam.

It is common for bulls to lose body condition during the early part of the breeding season when working hard to cover a high percentage of the cows in the herd. If body condition continues to decline measurably after the middle of the breeding season and bulls are still very active in monitoring and breeding cows, you should check for fertility problems in the bulls. Bulls in low body condition score should be replaced in the breeding pasture by bulls in adequate condition. You should record body condition scores on bulls at turnout and then periodically during the breeding season for use in management decisions.

Detect estrus at least once and preferably twice per week during the breeding season. Estrus should be observed at a distance from the cows early in the morning or near dusk when it cools off just as you would for an artificial insemination program. While finding a bad bull during the breeding season is a bad thing, learning of a problem at pregnancy check time in the fall is even worse. Remember, getting cows bred is profit mission number one! Pregnant cows require fertile bulls. It pays to keep tabs on the breeding performance of your bulls during the breeding season.

Trichominiasis affected counties in Kansas



Source: KAHD
Revised 4 April 2013

"Detect estrus at least once and preferably twice per week during the breeding season."

Double crop forages after wheat

Doug Shoup, crops & soils specialist, John Holman, cropping systems specialist, Jaymelynn Farney, beef systems specialist

Traditional double crop options after wheat grown for grain have been soybean, sorghum or sunflower. Double cropping after wheat is a fairly common practice in central and eastern Kansas where rainfall often occurs toward the end of the summer and the growing season can be long enough to produce grain. However, with the shortage of forages from the extreme drought the last two years, producers may consider planting a forage crop or cover crop instead of a grain crop.

"...with the shortage of forages from the extreme drought the last two years, producers may consider planting a forage crop or cover crop instead of a grain crop."

Soybean

Soybean has been the most popular double crop option in eastern and central Kansas, largely because glyphosate-resistant varieties have made weed control easy. However several weed species in Kansas have developed resistance to glyphosate, so the cost of weed control in soybean may increase.

Although double crop soybean can be harvested as a grain crop, it also has value as a forage crop. Soybean is a legume and as such, it is a high protein feed. Cattle can utilize soybean as either a hay or grazing crop. If double crop soybean produces enough growth for a hay crop, however, it likely has had good enough weather to make a profitable grain harvest. Double crop soybean is not very conducive for grazing. It often is upright in growth and the stem will break easy if cattle open-graze a field, thus potentially wasting much of the forage. Strip-grazing failed double crop soybeans will increase its utilization. Although not ideal as forage, it can be used that way if a poor grain yield is expected. Soybean stubble can be also be harvested as hay after grain harvest; however, its forage quality will be marginal.

Grain Sorghum

Although not as common in the eastern half of the state, grain sorghum is also utilized for a potential double crop option after wheat. Grain sorghum seed is generally less expensive than soybean, however it usually requires more fertilizer expense -- primarily nitrogen. Weed control has been an issue with sorghum, but herbicide expense is becoming more similar to other crops because of the increase in herbicide-resistant weeds in other crops and new herbicide options available in grain sorghum. Under favorable conditions, double crop grain sorghum can be a very profitable grain crop. However, if drought and heat occur during the mid to late summer and grain yield potential looks very low, sorghum can still be used as a quality forage crop.

Sorghum has some nice advantages as a forage crop. Sorghum can produce good biomass until the first killing frost and often will retain its leaves well into the fall and winter.

A couple disadvantages exist for grazing sorghum. First, grain sorghum, like most sorghum species, will accumulate prussic acid. Prussic acid can be very toxic to livestock and extreme caution should be exercised when grazed. Concentrations of prussic acid generally increase after a frost, during a drought, and in new rapid plant growth (often following a rain ending drought or following a freeze). Since the highest concentration of prussic acid is in new growth, grazing should commence once new growth has reached 18 inches in length. After a killing frost, wait at least five days or until the frozen leaf tissue has completely dried out before grazing. Prussic acid is a gas so when plant cells rupture (such as in freeze-damaged leaves), delayed grazing will allow it to dissipate. Similarly prussic acid is not a big concern in hay if allowed to properly cure during the drydown process.

A second concern for grazing or haying sorghum species is the accumulation of nitrates. Nitrates can be just as lethal as prussic acid and caution should be taken when forage reaches levels high enough to affect livestock. Nitrate is used in the plant mostly for protein synthesis. It is absorbed in the roots and transported to the stems and leaves. When growth is slowed due to drought, freeze, or cool and cloudy weather, nitrates will begin to build up in the plant at levels toxic to livestock. Because nitrate synthesis and transport are limited, the largest accumulations will generally be at the base of the plant and the stalk. Grazing livestock should be removed from high nitrate forage for 14 days of resumed normal growth. Reduced nitrogen rates and seeding rates can also help reduce the risk of nitrate accumulation.

Grazing high nitrate or prussic acid forages is extremely dangerous to livestock. Producers should always test forages to determine when it is safe to utilize these types of forages.

Continued… see Double Crops on page 5

Double Crops … *Continued from page 4*

Forage Sorghums, Sudangrass, and Sorghum x Sudangrass

Forage sorghums are developed with biomass as the goal, not necessarily grain production. While some forage sorghums do produce grain that can be a great complement to silage, most forage sorghums are developed strictly for forage production.

There are several forage sorghum types. Photoperiod sensitive forage sorghums are developed to maintain the plant in a vegetative state. This can accomplish two things compared to conventional hybrids: more forage biomass, and slower decline in forage quality as the plant matures. Another type of forage sorghum is brown midrib (BMR). These hybrids have been developed for high forage quality and digestibility by decreasing the concentration of plant lignin. Conventional forage sorghums have been bred to produce large amounts of biomass. Conventional varieties should be harvested near heading if harvested for hay, or later if harvested for silage.

Sudangrass is a sorghum species that may not produce as much total forage as forage sorghum, but will have smaller stems and exhibit greater regrowth potential from grazing than some of the other sorghums. Therefore, sudangrass is a nice option for grazing and haying while forage sorghum is great for hay or silage. Harvesting sudangrass early can allow for a two-cut hay system. Because sudangrass and forage sorghums are closely related, they have the ability to cross and produce forage sorghum x sudangrass hybrids. The progeny produce more forage than sudangrass and have more regrowth potential than forage sorghum.

Many combinations of conventional, photoperiod sensitive, and BMR traits in forage sorghum, sudangrass, and forage sorghum x sudangrass hybrids are available. Like grain sorghum, forage sorghums and sudangrass can also be accumulators of nitrates and prussic acid. None of these species should be fed to horses.

Both forage and grain sorghums can be harvested as silage to feed to cattle. Depending on the variety and/or quantity of grain in the harvested plant sorghum, silages can offer as much energy to the animal as "good" quality corn silage. The process of ensiling will also help manage nitrate issues. It has been reported that between 30-50% of the nitrate can be reduced by the fermentation process.

Millets

Hybrid pearl millet and German foxtail millet are two additional grass forages that can be planted after harvested wheat. Millets generally have a much higher leaf:stem ratio and quick growth potential. While total forage yields are less than the sorghum species, millet species are not prussic acid accumulators. Producers should still be wary of millets' potential for accumulating high nitrates. Millet that is low in nitrate is safe to feed to horses.

Alternative Forages

One additional forage for double cropping after wheat may include crabgrass. Crabgrass is a high-quality forage that is drought hardy and an efficient user of nitrogen fertilizer. Although producers can utilize the natural "weedy" population of crabgrass that may already exist in a field (if it is a pure enough stand), there are also developed varieties of forage crabgrass. Red River was one of the first popular crabgrass varieties grown in Kansas for forage. Another variety that has had equal or greater biomass production in K-State trials is called Quick-N-Big.

Cover crops are becoming more popular among producers, and are often planted as a combination of one or more species. Cover crops may include one of the forages previously mentioned since these crops are known to be somewhat adapted to the hot and dry Kansas summers. Occasionally, the addition of a less common crop, such as sunn hemp, mung bean, clover, or brassica species, is included. Often sorghum or millet species in a cover crop mixture will become dominant because of their drought tolerance and aggressiveness, although other species may grow and contribute to the cover/forage. Producers should be aware that some of these more exotic cover crops may be sensitive to herbicide carryover from many of the commonly applied wheat herbicides. Always test any forage for nitrate and prussic acid before grazing or feeding.

For more information on summer annual forages refer to "Summer annual forages: selection and production characteristics", K-State publication MF-2871 (http://www.ksre.ksu.edu/bookstore/pubs/MF2871.pdf). Hopefully it won't be necessary, but if it remains dry you might also want to refer to "Nontraditional forages as emergency or supplemental feedstuffs," K–State publication MF-2872 (http://www.ksre.ksu.edu/bookstore/pubs/mf2872.pdf).

K-State Cattle Feeders College May 9th

The K-State Cattle Feeders College will be held May 9, 2013 at the Scott County Fairgrounds, Scott City KS. This year's program will begin at 5:00 PM and features several sessions designed exclusively for the commercial cattle feeding industry.

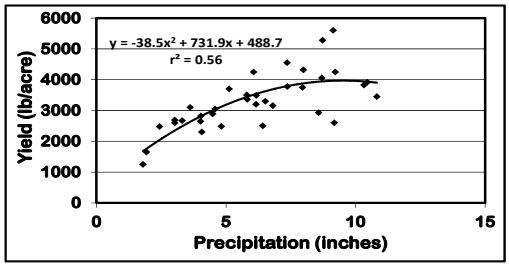
Sessions, speakers and topics are listed below:
Economic Outlook
The current feeder situation; Indicators and implications- Dr. Glynn Tonsor, K-State Ag Economist
Cattle Crew Session
Trimming and shoeing the equine foot- Mr. Vince Vesely, AFA Examiner, Certified Journeyman Farrier
Management of high health risk cattle-Dr. Dan Thomson, K-State College of Veterinary Medicine
Mill and Maintenance Crew Session
Feed Mixer Technology- Mr. Mark Cooksey, Roto-Mix LLC.
Truck Service and Maintenance-Mr. Mark Holderness, Dodge City International

There is no cost to attend but registration is required by May 3rd. Corporate sponsors include Merck Animal Health, Animal Health International, Lallemand Animal Nutrition, Roto-Mix, Dodge City International, The K-State Veterinary Diagnostic Lab and the K-State Beef Cattle Institute. Don't miss this event! For more information on speakers, go to www.southwest.ksu.edu . To register, contact Justin Waggoner, K-State Beef Systems Specialist, (620)-275-9164, jwaggoon@ksu.edu or John Beckman, Scott County Extension Agent, (620)-872-2930, jbeckman@ksu.edu.

Precipitation ….. *Continued from page 1*

"The two month period that had the greatest relationship with end of season forage production was May and June precipitation."

Fig. 2. The relationship of 36 years of rangeland yield and total precipitation in May and June at Hays, KS

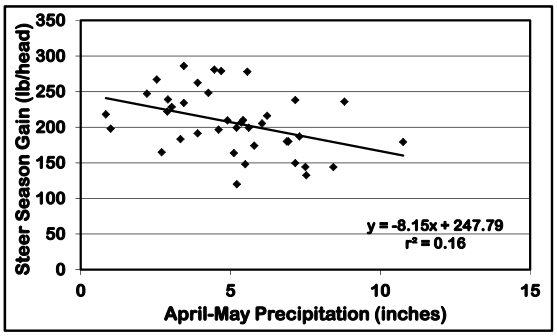


Winter precipitation, OctPY to April of the current year precipitation (late fall, winter, and early spring precipitation) had almost no relationship to end of the year forage production and was a poor predictor of yield (r^2=0.11). The lack of precipitation during the winter does not indicate that a lack of forage production will occur, since precipitation in May and June can still produce favorable forage growth. Precipitation the prior year and prior two years to the current growing season also had no relationship whatsoever with current year forage production (r^2=0.07 and 0.00).

For drought planning, it appears that stocking at a recommended moderate stocking rate for the rangelands being utilized, and then adjusting that stocking rate based on condition and vigor of the vegetation entering the winter dormant season, should be the baseline for spring stocking rates since winter precipitation had almost no relationship to end of growing season forage production. Further refinements of the stocking rate could be based on May precipitation and May and June precipitation combined since over half of the variation in end of growing season forage production can be explained by precipitation that occurs during May and June. However, sequential years of drought may place rangelands into a state of lower vigor and lower plant density, and therefore beginning season stocking rates may need to be reduced with further adjustments occurring during the spring growing season.

Producers are also concerned about animal gain during drought seasons. Animal gains during these 36 years showed that as precipitation increased, total animal gain decreased (r^2=0.16, Figure 3).

Fig. 3. Relationship between stocker steer total season animal gain and spring precipitation from April to May during 36 years of stocking studies at Hays, KS

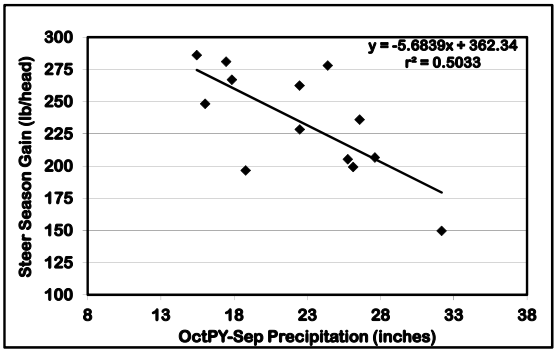


continued...see Precipitation on page 7

Precipitation … *Continued from page 6*

Periods of drought place plants into moisture stress, so plants do not have the available water to develop and mature as quickly. Therefore, plants in a drought remain in a less mature stage of development for a greater length of time through the growing season and would also have greater forage quality for a longer period of time. The most recent thirteen years of stocker studies show, when animals are managed with consistent vaccination, growth implant, stocking rate, and supplement strategies, that total animal gain during the whole grazing season had an evident negative relationship with precipitation from OctPY to September of the current year (r^2=0.50, Figure 4). As precipitation increases, individual animal gains decrease over the same time period. The best individual gains tended to occur during drought years.

Fig. 4. Relationship between stocker steer individual total season animal gain and annual precipitation from October of the previous year to September of the current year during the years of 1999 to 2012 at Hays, KS



As long as animals have adequate current year forage available to meet daily dry matter intake needs during drought, the forage consumed should be of greater quality. Animals that do not perform well during drought periods may be limited by heat stress, poor water quality, old residual forage from the prior year, or lack of total available forage.

Generally, grazing animals are likely not limited by current year forage quality of native rangelands during dry years. Early growing season precipitation can be an early indicator of how well animals will perform on an individual basis, but early precipitation in May and June give an even greater indicator of how much forage growth can be expected at the end of the season to enable producers to adjust stocking and to make animal management decisions.

Participate for a chance to win!

Your help is requested in learning about practices beef producers use in conjunction with AI and synchronization of estrus. Responses are sought from those that use AI for their own operation as well as those that provide AI services to others. A majority of the survey questions are simple to answer (have you used gender sorted semen? y/n). A few questions allow you to share what you have learned using AI. Most people should be able to complete the survey in 10 to 20 minutes.

As an added incentive to complete the survey, one lucky respondent will receive 50 Estrotect Heat Detection Patches. Results of the survey will be available at www.beefrepro.info.

Follow this link to the survey: https://surveys.ksu.edu/TS?offeringId=208705