



TIMELY TOPICS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University

DATE: April 27, 2006

VOLUME: 8

This newsletter was developed by your team of Area Specialists in the Northeast District. Our goal is the dissemination of research-based information.



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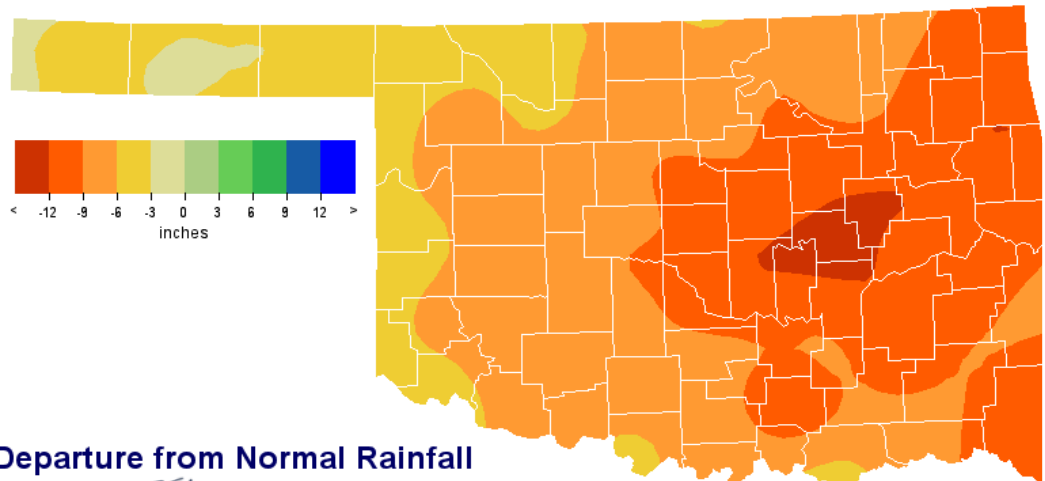
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SPECIAL DROUGHT ISSUE

DROUGHT IN NORTHEAST OKLAHOMA

Robert L. Woods

Even though it did rain across much of NE OK this week, rainfall records from the Oklahoma Mesonet show that the last 6 months have been the 2nd driest on record for the central and east central part of the state and the 5th driest in the northeast part of the state. Across the 21 counties that make up the Northeast Extension District, rainfall for the past 6 months was 6 to 12 inches



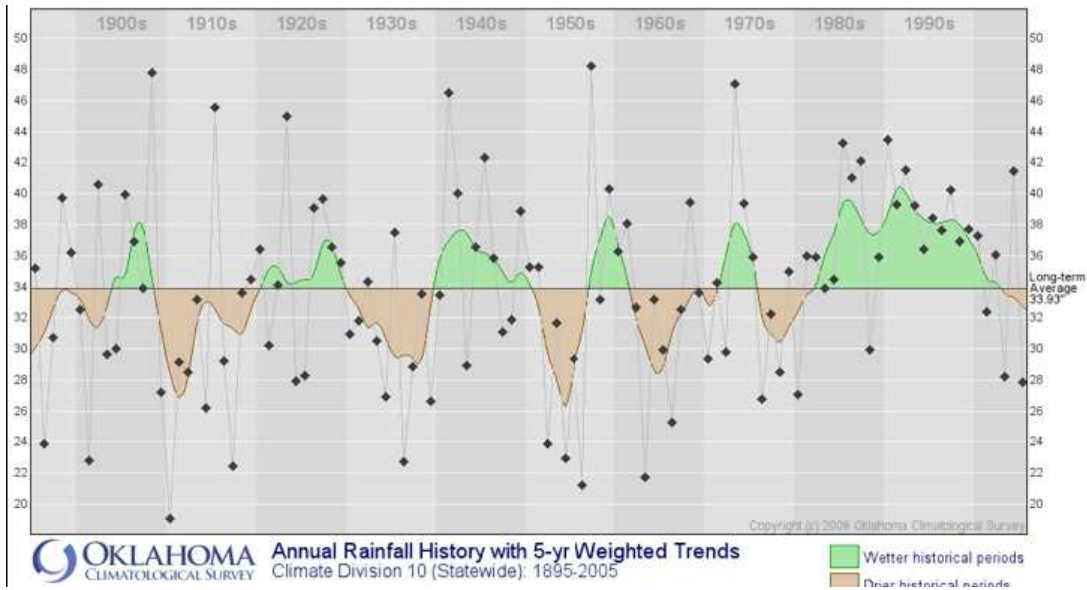
Departure from Normal Rainfall

Oklahoma Climatological Survey  Last 180 Days
Oct 27, 2005 through Apr 24, 2006

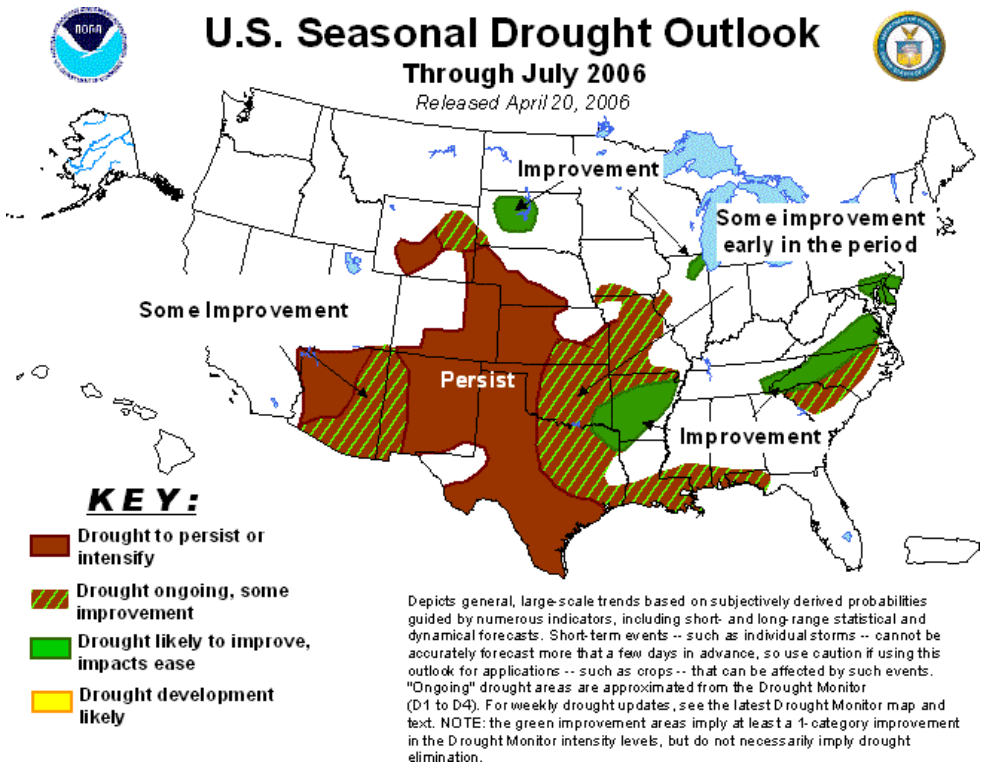
Copyright (c) 2006 Oklahoma Climatological Survey
All rights reserved. Rainfall data collected by Oklahoma Mesonet
Image created 05:46 CDT Apr 25, 2006

According to information from the Oklahoma Climatological Survey, “Oklahoma appears to be transitioning once again into a decadal-scale period of below average precipitation. Measured precipitation during three of the last five years has been below the average of the past 111 years. In the past year, drought conditions across portions of the state have approached levels similar to droughts of the 1930’s or 1950’s.”

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The long term weather forecast by the National Climate Prediction Center, updated on April 20th, predicts drought conditions to continue through July with some improvement early in the period.



In summary, recent rainfall has not been sufficient to recharge soil moisture depleted during an extended period of below normal rainfall. Current predictions would indicate that rainfall could continue at or below normal for the next several months. It would appear those grazing livestock should be adjusting their management for a reduced amount of rainfall.

WHAT WILL IT TAKE TO BREAK A DROUGHT?

Robert L. Woods

The current drought has created 2 problems: depleted soil moisture and dry ponds. Fixing these problems will depend on the amount and intensity of rain events, water holding capacity of soils, and the water infiltration rate (Perc rate). Recharging soil moisture can require up to 11 inches of low intensity rainfall that will allow infiltration into the soil. Refilling ponds requires a higher intensity rainfall that exceeds 0.6 of an inch and on some sites as much as 2 or more inches per hour.

Water Holding Capacity and Infiltration Rates of Various Soils in the Northeast Extension District (Summarized from information found in NRCS Soil Surveys).

	Soil Depth (feet)	Total Water Holding Capacity (inches)	Water Holding Capacity (per foot)	Perc Rate Surface only (in/hr)
Taloka	5	10	2	0.6-2
Dennis	5	9	1.8	0.6-2
Bates	2.5	5	2	0.6-2
Parsons	4	8.2	1.4	0.6-2
Chouteau	5.5	9.4	1.7	0.6-2
Okemah	5.5	9.9	1.8	0.6-2.0
Stephenville	2	2.5	1.3	2-6
Darnell	1	1.3	1.3	2-6
Hector	1.3	0.8	0.05	2-6
Enders	3.2	5.6	1.8	0.6-2
Linker	3	3.9	1.3	0.6-2
Chickasha	3.6	5	1.4	2-6
Renfro	6.7	8.6	1.3	0.6-2
Port	6.7	12	1.8	0.6-2
Verdigris	5	11	2.2	0.6-2
Mason	5	9.3	1.9	0.6-2
Osage	>5	9.9	2.0	0.2-.6
Choska	5.5	8.3	1.5	0.6-2
Clarksville	5	3.6	0.7	6-10

Average total rainfall for the months of May, June and July in the 21 northeast counties ranges from 12.6 inches in Pawnee County to 14.6 inches in Cherokee County. Transpiration and evaporation normally exceeds this amount during this time period. So, beginning with below normal soil moisture and predictions for below normal rainfall during this time period, means there is little chance to rebuild soil moisture supplies. Dr. Wilfred McMurphy who taught Pasture Management and Forage Production when I was in school said "Eastern Oklahoma is always 2 weeks away from a drought". This will be especially true this summer unless we receive some exceptionally timely rains.

BERMUDAGRASS MANAGEMENT IN A DRY SUMMER?

Robert L. Woods

Webster's defines drought as a prolonged period of dryness or a chronic shortage. In practical terms, a drought generally means it rains less, not that it will not rain at all. The challenge is having a plan that that will make maximum use of a reduced amount of moisture.

Rainfall patterns tend to be cyclical and during the 1980's and 90's northeast Oklahoma was fortunate to have an extended wet spell. As a result of this 20 year wet spell, some newcomers to the industry and even some experienced livestock producers may have increased stocking rates based on consistently higher than normal forage production. Based on what we are currently experiencing and long range forecasts, it would appear that perhaps we should adjust stocking rates and pasture management to weather an extended dry spell.

During a dry cycle, some inputs may be adjusted downward to compensate for lower yield expectations but many things recommended during the wet spell become more critical. Added emphasis will be placed on the timing of inputs to take maximum advantage of available moisture.

In east central Oklahoma, spring season rainfall has exceeded 8 inches in all but 6 of the past 111 years. Summer season rainfall has exceeded 6 inches except for 7 of the 111 years. Together, you would expect to get at least 14 inches of rainfall during the spring and summer even during an exceptionally dry year. The average spring and summer rainfall for east central Oklahoma is about 25 inches.

Most eastern Oklahoma producers expect unfertilized bermudagrass pastures to normally yield about 1 ton of forage per acre. The reason, bermudagrass needs about 20 inches of available moisture to produce a ton if it was not fertilized. If rainfall is reduced to 14 inches, which is about 60% of normal, you could expect bermudagrass to yield about 1200 pounds in a dry year instead of the normal 2000 pounds per acre.

If adequately fertilized, bermudagrass can yield about 1 ton of forage with 4 inches of water. In a dry spring and summer season, with only 14 inches of moisture, bermudagrass still has the potential to produce 3 tons per acre if fertilized with 150 pounds of actual nitrogen per acre. In 1977 and '78 rainfall at the Eastern Research Station near Haskell was 8.76 inches and 14.33 inches below the long term average. Yet, in 1978 bermudagrass fertilized at 200 pounds of nitrogen per acre produced 7,438 pounds per acre. Timing is critical because to achieve this yield in the dry years you must have adequate nitrogen available when moisture is available.

In summary, fertilizing bermudagrass could be more important in a dry year than in a wet year. Old recommendations such as concentrating efforts on the most productive soils that have the greatest water storage capacity and fertilizing according to soil test recommendations still apply. And remember, waiting for it to rain before you fertilize might be a costly missed opportunity in a dry year.

GRAZING MANAGEMENT STRATEGIES FOR RECYCLING NUTRIENTS

Josh Payne, Ph.D.

Area Animal Waste Management Specialist

During drought conditions, many cattle producers are faced with soil fertility decisions. Some opt to not fertilize; however, fertilizing during a drought may be the most important time to do so. A well fertilized soil will utilize limited rainfall more efficiently than a poorly fertilized soil.

In addition to fertilizing pastures, producers can reduce nutrient losses by practicing certain grazing management strategies. Although grazing management does not add new nutrients to the soil, it can, however, recycle forage nutrients removed by cattle back into the pasture.

According to the NRCS Agricultural Waste Management Field Handbook, a 1000 lb live weight grazing beef cow can excrete 0.33, 0.28 and 0.31 lbs/day of N, P₂O₅ and K₂O, respectively. Over a one year period, this translates to 120, 102, and 113 lbs of N, P₂O₅ and K₂O, respectively. If assigning a stocking rate of 1 cow per 3 acres, this further translates to recycling 40 lbs N, 34 lbs P₂O₅ and 38 lbs K₂O/acre/year.

By using cross-fencing and intensive grazing systems, a producer can recycle these valuable nutrients back onto the pasture rather than concentrating them into heavy-use areas where animals feed and water. Nutrients lost to waterways are not only an example of poor nutrient management but are also a source of pollution. Cattle with full access to ponds and streams can erode the banks while excreting excess organic matter and nutrients into the water. This can result in algal blooms, depletion of O₂ and fish kills. Limiting or restricting livestock access to waterways by fencing and providing water or mineral supplements away from waterways can also improve nutrient management. A producer that continually practices proper nutrient and grazing management strategies can improve soil fertility, water quality and reduce nutrient inputs over time.

IRRIGATING PASTURE GRASS IN EASTERN OKLAHOMA

Mike Kizer,

Extension Irrigation Specialist

Whenever there is a prolonged period of low rainfall, Extension educators get questions about setting up pasture irrigations systems for livestock feed. Whenever these questions come to me, the first question I ask is, “Why do you want to irrigate?” If the answer is that the producer has decided that it is time to plan for an improved pasture management and forage production system that will be an on-going component of their total livestock production system, then I get down to business. If the response is that his pastures are dried up and he is out of feed, I try to politely suggest that he check out the price of hay.

There are two main reasons for this seemingly flippant reply. First of all, it takes

time to order irrigation systems, pipes and pumps, and more time to drill wells. If you are only thinking of this after your grass is dried up, it may take a month or two to get equipment ordered and delivered, and much longer than that to work your way to the top of a well driller's list of clients. So starting your plan in May or June is several months too late to do much watering this season.

Secondly, irrigating is an expensive operation. A new hard-hose traveling gun (the most versatile and portable system for irrigating pastures with irregular shapes, trees, etc.) that can apply 1-1 ¼ inches of water per week on 40 to 60 acres of pasture will cost about \$18,000. Throw in about 1500 feet of 6-inch aluminum mainline at \$3.00 per foot for another \$4500. A horizontal centrifugal pump and engine to draw 250 gpm of water from the river and deliver it at 70 psi from the traveling gun nozzle will take another \$5000. We are already up in the \$27,500 for hardware and we haven't pumped a drop of water yet. If this equipment is assumed to have a working life of 15 years and the time value of money is 8%, then the annual cost of owning this irrigation system is \$3200 per year. Plus, about 8% of the initial cost for maintenance and repairs, insurance and taxes adds another \$2200 per year in costs.

If you are paying \$2.00 per gallon for farm diesel, you can expect to spend about \$330 per week for fuel to run your traveling gun the 140 hours it will take to put out 1-1 ¼ inches of water. If you run the system for 13 weeks per year, that adds \$4200 per year for pumping fuel, plus approximately another 5% for oil and lubricants. So that brings the annual cost of owning and operating your system to \$9900, assuming your labor moving the equipment for each set-up is free. Your increased income from 40-60 acres has to pay for that amount—about \$165-\$245 per acre per

year. Is the value of the increased forage produced worth that?

If your intent is to operate this equipment every season to produce improved pasture and to bale high quality hay from your excess forage, the investment may be justified. Though in most cases the economics of investing in equipment just for irrigating grass is "iffy" in eastern Oklahoma where normal effective rainfall is about 17 inches from May through October and about 15 inches of irrigation is needed to produce maximum biomass from Bermudagrass. If, on the other hand, you will only run this equipment once every 5 or 6 years when there is an extended dry period, you are essentially having to pay off this investment in 2 or 3 seasons instead of 15 and you are probably better off investing your money elsewhere. Equipment that sits in the shed for the majority of its working life is not making you any money. And making money is what this decision is all about.

WILL GRASSHOPPERS HOP INTO DROUGHT STRESSED CROPS?

Michelle Buchanan

Area Pest Management Specialist

It seems as though grasshopper populations go in cycles. One year, we may have a "Bad Grasshopper Year", which may be followed by two or three years where we have little to no problems with grasshoppers. Based on current weather conditions and predictions for the summer, this could very well become one of those "Bad Grasshopper Years", which is actually bad for producers. It is hard to predict whether grasshoppers will become enough of a problem in pastures to justify the expense of a spray application. Often, large numbers of nymphs will hatch, but as time,

weather and natural enemies take their toll, they may not develop into a severe problem.

History shows that grasshopper populations are frequently associated with dry weather conditions or drought periods. This is also the time period that the forage crops seem the most compromised and damage is hard to recover from. If the infestations are spotted early, an insecticide application in egg hatching areas may reduce numbers to the extent that few acres will require chemical treatment later on. Egg hatching areas include fencerows, grassy terraces and roadside ditches. Controlling the nymphs early in their life cycle around forage production fields can go a long way in reducing damage later in the summer.

The best time to control grasshoppers is while they are immature. They become more difficult to control as they become 4 and 5 instar nymphs (bigger grasshoppers). Full grown adult grass hoppers are nearly impossible to control effectively with chemicals. In well fertilized tame hay meadows, pastures and intensively managed crops like alfalfa, treatment may be warranted if you have a history of excessive populations in previous years and you are counting on the forage production from these hay production sites to get you through the winter. So, when you start to see the small ones, it is time to consider treatment before the problem explodes. The question arises, is the cost of chemical application to save the forage crop less than what it would cost you to replace that lost forage with purchased hay? Treatment thresholds include: Small grasshoppers (1/2 inch), treat when populations reach 24 to 100 per sq. yard; Adult grasshoppers (greater than 1/2 inch), treat when populations reach 8 to 40 per sq. yard.

Throughout the spring and early summer would be a good time to scout forage production areas for the presence of the

nymphs and if hatching areas are identified, treat that specific location before the grasshoppers have a chance to grow into adults.

Some of the more common chemical controls for grasshoppers are listed below:

Carbaryl: (Sevin) – 0.5 to 1.0 lb/acre for small grasshoppers, 1.25 to 1.5 lb/acre on adults. See label for grazing restrictions, rate and safety precautions.

Dimilin: 0.5 – 2.0 oz/acre applied when grasshoppers are in 2nd or 3rd instar nymphal stage. See label for grazing restrictions, rate and safety precautions. Restricted use pesticide.

Malathion: 1.5 – 2.0 pt/acre. See label for grazing restrictions, rate and safety precautions.

Methyl parathion: 1.5 pt/acre. See label for grazing restrictions, rate and safety precautions. Restricted use pesticide.

(This article draws information from an article previously written by Chris Rice, SE District Area Agronomist.)

NOW IS A GOOD TIME TO CULL THE HERD

Bill Burton

Even if we were not facing drought conditions, this would be a good time to consider culling your cows heavier than normal. Many livestock producers have not realized it, but we have ended the longest cattle cycle in history and started a new one. A cattle cycle initiates when the cattle inventory begins to increase and continues until it begins to

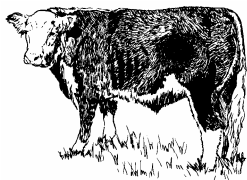
increase again. The last cattle cycle lasted 14 years with the previous one lasting 12 years.

When prices are high the cowherd is generally growing. Producers have been keeping their older cows longer than they might otherwise and retaining more heifers than they normally would. The result of this is more steers hitting the ground, which translates into more pounds of beef reaching the grocery stores causing lower prices for everyone.

So the question for livestock producers is, "How am I going to survive with lower calf prices?" This is easily answered with "Either raise income, lower expenses or both." So how can a producer achieve either of these options? One answer is to cull their cows heavier than they have been. This will generate additional income for this year and also reduce operating expenses.

The issue then becomes how much will income drop due to the fewer number of cows. If the cows culled were older cows, they were probably costing more than the other cows and more likely not to have a calf. So the reduction in income might not be as bad as expected. I have had producers tell me that they did not see any significant reduction in income due to heavier culling.

With the drought facing everyone this year, now might be a good year to start culling those older, unproductive cows from the herd. Cull cows are still bringing good money today, but it won't be that way for long. Once the drought is over and pastures have recovered, producers will likely find cheaper cows to buy back.



TAX CONSIDERATIONS IN A DROUGHT YEAR

Bill Burton

When there is a drought and ranchers are forced to sell more of their breeding stock than normal, there are income tax implications that need to be considered. Normally the sale of any breeding stock would qualify for capital gains, resulting in a 5% to 15% tax on the gain.

In a drought, ranchers must choose between two provisions to defer the gain on their additional cull sales. First, they can elect to postpone the income from the gain for a period of one year. The second provision allows them to postpone the gain if "like animals" are replaced within two years of the end of the tax year of the drought sale. This is a true "like-kind" exchange, so beef cows must replace beef cows. Beef cows are not allowed to replace dairy cows.

Also, this is only for those animals that were sold over normal culling rates. So, if a rancher normally culls 20 animals each year, and this year they cull 30 head, then these rules would only apply to the 10 additional head. The other 20 would be subject to capital gains in the year the sale occurs. Each producer's tax situation is different. Anyone who finds themselves facing this situation should contact their income tax preparer to examine their alternatives.

Ranchers can possibly use the drought and this tax rule to their advantage. If the price of cull cows is high when they sell, they can postpone the gain for up to two years and purchase new cows when they might be priced much lower. This is not a sure thing, but it is possible to use this drought to make a good business decision. Cull your herd now when prices are relatively high, and buy back when they are lower.

NATIVE RANGE SITE STOCKING RATES IN A DRY YEAR

Robert L. Woods

The NRCS Soil Surveys are a good source of information regarding range site production in wet versus dry years. Yield estimates for some soils and range sites across the northeast district show that, on the average, dry year production averages 25% less than a normal year or 45% less than a wet year.

It could be necessary to reduce stocking rates on native pastures by as much as 45% if stocking rates were increased over time to compensate for above average forage production due to the extended period of wet years. A 25% reduction might be sufficient if

stocking rates had been more conservative and based on a normal year production estimate.

These production estimates were determined by harvesting ungrazed, end of season, standing crop. Stocking rates should be based on a harvest efficiency of 25 to 30%. For example, only 1530 pounds of the 5100 pounds shown as a normal year production for the Taloka soil would be consumed by grazing cattle.

In summary, stocking rates on native range may require an adjustment for a dry year. However, it might be possible to compensate for some of the lost production on native range by fertilizing bermudagrass.

Season long production estimates for some soils and range sites taken from NRCS Soil Surveys for Payne, Osage, McIntosh, and Mayes Counties.

Soil Type	Range Site	Season Long Production (Pounds Per Acre)		
		Favorable year	Normal year	Unfavorable Year
Taloka	Loamy Prairie	6800	5100	4000
Dennis	Loamy Prairie	7000	5500	4500
Bates	Loamy Prairie	7000	5500	4500
Parsons	Claypan Prairie	4500	3000	2000
Chouteau	Loamy Prairie	7000	5200	4000
Okemah	Loamy Prairie	7000	5500	4500
Stephenville	Sandy Savannah	4500	3300	2500
Darnell	Shallow Savannah	3200	2100	1400
Hector	Shallow Savannah	3000	2000	1000
Enders	Sandy Savannah	4000	3000	2000
Linker	Sandy Savannah	4800	3700	3000
Chickasha	Loamy Prairie	5500	3850	2750
Renfro	Claypan Prairie	4000	2800	2000
Port	Loamy Bottomland	8500	6100	4500
Verdigris	Loamy Bottomland	10000	8500	6000
Mason	Loamy Bottomland	11500	9400	8000
Osage	Heavy Bottomland	8000	6200	5000
Choska	Loamy Bottomland	9000	7200	6000
Clarksville	Smooth Chert Savannah	3000	2000	1000

PLANT POISONINGS AND DROUGHT GO HAND IN HAND

*Dave Sparks, D.V.M.
Area Food-Animal Quality
and Health Specialist*

When it forgets to rain, livestock producers have all the trouble they need. When a rancher loses livestock to poisonous plants during a drought, it only serves to compound the economic hardships he or she is dealing with due to increased supplementation costs and decreased stocking rates. Drought, however, is when toxic plants deliver their largest impact.

Drought brings out toxic plant problems in several ways. During drought, toxic plants become more prevalent. Many toxic plants are able to withstand drought better than more palatable forage plants. As the drought continues, decreased competition means greater population of toxic plants. Many of the toxic plants become more toxic under stress conditions such as drought. Drought also causes changes in the animal which lead to problems. Livestock are selective grazers and usually graze only safe and palatable plants, but as the more palatable plants disappear, the animals are sometimes required to graze the unpalatable toxic plants or go hungry. As they develop deficiencies of protein, energy, minerals, or vitamins, they are less able to neutralize the toxic components of the plants and less able to withstand the insult to their system. Deficiencies of phosphorous or Vitamin A can cause animals to eat with relish things they wouldn't usually consume.

Be especially vigilant when conditions change. Many times when a small thunderstorm passes over, the toxic plants are the first to green up and look good to hungry stock. If you move animals to areas you don't normally graze, you may have plants that

livestock normally don't encounter. For example, Johnson grass is seldom seen in pastures but is common in hay meadows or cropland. Add in the fact that drought causes Johnson grass to become much more toxic than normal and you have a potential disaster.

If toxic plants are present, the first thing to think of is to reduce the animal's need to consume them. Very seldom do animals have problems with toxic plants if palatable forage is available in adequate amounts. Toxic plants can be removed by mechanical, chemical, or biological controls. Some livestock species will readily and safely eat plants that are toxic to other species. This may allow you to clean up a pasture during the drought, so that when it does rain, safe forage will be available for the normal animals grazed there.

The first step in preventing problems is to recognize plants that might be a problem and understand their toxic mechanism and effective mechanisms of control. Some of the common Oklahoma plants that cause problems during drought are white clover, sudangrass, Johnson grass, tall fescue, lespedeza, oak, pigweed and millet. There are many others that are less common but equally dangerous. The Texas Cooperative Extension Service and USDA have developed a Toxic Plant Database. It has pictures, descriptions, symptoms, and information on distribution and habitat. You can find it online at <http://texnat.tamu.edu/CMPLANTS/toxic/index.htm>.

Remember that preventing livestock poisoning is easier than curing poisoned livestock.

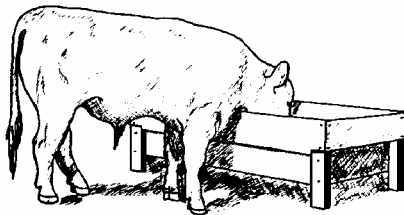
LIMIT FEEDING AN ENERGY SUPPLEMENT TO EXTEND FORAGE

Kent C. Barnes

Grazing forages has always been and will continue to be the most economical and practical way to maintain beef cows. However, in drought situations limit feeding grain may be an economical alternative to purchasing expensive hay. When drought is accompanied by relative low non-forage feed prices, producers can evaluate the possibility of using concentrates to feed cows.

It is possible to reduce forage use by 70 to 80% by limit-feeding some grain to cows. Given the cost of purchasing and hauling hay, limit-feeding grain may reduce the cost of meeting nutritional needs by 20 to 40%. In most cases, a limit-feeding program for cows will require some changes in cow management, may increase labor for feeding, and may require additional feedbunks. These considerations will temper the feasibility of this alternative in some operations.

OSU fact sheet F-3028 explains limit feeding beef cows in detail and is intended to provide management tips to help producers evaluate the opportunity to utilize this technique. This fact sheet and other information to help cattlemen cope with drought are available from OSU County Extension offices.



COPING WITH DROUGHT: STOCKER CATTLE

Kent C. Barnes

Certainly, no cattleman ever plans to find himself with a group of stockers and limited quantity or quality of grass. However, little to no rain in areas of Northeast Oklahoma this spring have required some to search for strategies to cope with drought.

During periods of forage shortages, stocker cattle should not be supplemented with feeds that enhance forage utilization. High protein supplements (38 to 40% CP) improve forage digestibility and increase forage intake as much as 30%.

With limited grass, stocker cattle should be supplemented with larger amounts, over 5 pounds/head/day, of low to medium protein (up to 20% CP) feeds. These supplements will displace at least an equivalent amount of forage in the animal's diet. If the supplements contain starch, the energy source in grains such as corn, forage intake will be reduced beyond that amount displaced by the feed. This negative effect by starch on forage digestibility and intake is due to a change in the rumen microbial population. A thorough discussion of feeds for holding and growing stocker cattle is included in Chapter 17 "Supplementing and Feeding Calves and Stocker Cattle" of the OSU Beef Cattle Manual E-913.

The decision to feed stocker cattle on grass should be determined by the possibility of later rains rejuvenating depleted pastures. Other factors to consider include supplement costs, feedlot opportunities, potential lease pasture and market projections.

COPING WITH DROUGHT: COW MANAGEMENT

Kent C. Barnes

When faced with a shortage of forage due to drought, maintaining the reproductive integrity of the cowherd must be a high priority. Cows that are thin now or become thin prior to calving in the fall or next spring will not rebreed well and subsequent calving seasons will be late or spread out. Calf crop percentages will also drop. These negative effects are all too prevalent as observed after previous droughts.

A Producer's immediate reaction to a lack of pasture for cows is to begin buying hay. However, when forage is short, hay can be expensive. A balance of concentrate feeds with preferable costs per pound of TDN (total digestible nutrients, a measure of energy) and available roughage may be the better option.

Supplementing cows with feeds containing starch can decrease forage intake 10-30 percent dependent on the level of supplement fed. This reduction in forage intake is due to the substitution of feed for forage and a change in the rumen microbial population. Corn, which contains starch, is the classic supplement ingredient for use in these situations, and corn prices are relatively low this year. The corn should be fed at rates in excess of 4-5 pounds per cow daily to achieve significant reductions in forage intake. Soybean hulls and wheat midds, less expensive per ton than corn and fed at rates of 5-10 pounds per cow per day, will substitute for forage and stretch available supplies of pasture and hay. Ionophores such as monensin and lasalocid have been shown to reduce forage intake in cows 7-10 %.

Checking all cows for pregnancy and culling open, older, structurally inferior or otherwise no longer productive cows is a good

way to conserve forage and improve the productivity of the cowherd once the drought problems are over. The decision to retain replacement heifers should be re-evaluated in light of the lack of forage. However, a balance between heavy culling in the older cowherd and a number of younger females eating lesser amounts of forage supplemented with purchased TDN from concentrate feeds has merit.

A producer should not keep more cows that can be maintained in good body condition. Otherwise, poor calf crops and poor herd reproductive performance may later compound the cost of a drought. Remaining forage resources and the ability to purchase additional feed are keys to determining the number of cows that must be culled from the herd. Selling more cows than usual generates cash that can be used to feed the remaining cows.

MARKET CULL COWS IN GOOD FLESH

Kent C. Barnes

In periods of extreme drought, some ranches are forced to consider selling more cows than normal to reduce forage use and stretch limited forage and/or water supplies. If grain is relatively inexpensive, it may be beneficial to consider confined feeding of cull cows for 30 to 60 days before marketing. Although this requires additional feed, the payoff may be quite high.

Feeding some concentrate feed (with minimal hay) to cull cows may significantly enhance the value of those cull cows, especially if they are thin because of drought-related pasture conditions. In addition to having more pounds to sell, feeding cull cows may increase their price because of increased dressing percent or an increase in quality grade.

COPING WITH DROUGHT: CALF MANAGEMENT

Kent C. Barnes

Many Northeast Oklahoma cattlemen will soon need to make important decisions as a result of continued dry conditions. For spring calving herds, this is an especially critical time of the year with young calves and cows that are at the peak of their nutritional needs.

Early weaning spring-born calves will permit high conception rates and rapid rebreeding. They are big and old enough at forty-five days of age to be managed in a feeding program which will better utilize feed dollars. The forage these calves do not eat is now available for the cowherd and individual cows will consume 15-20% less forage if they are no longer lactating. With proper management, calf gains will approach two pounds per head daily with efficient feed conversions (approximately 4-5 pounds feed per pound of gain) and few health problems.

An early-weaning ration will contain about 30% cottonseed hulls and 50% corn. The remaining 20% will be made up of protein, mineral and vitamin supplements, and a coccidiostat. The ration should be 15% crude protein and 65-70% TDN. Producers may obtain more specifics from OSU Extension fact sheet F-3264 (Early Weaning for the Beef Herd).

Creep feeding calves will reduce forage intake by the calves but will have no effect on forage intake of the cows. The preferred component of the calf's diet is milk. Creep feed will substitute for forage, not milk. The overall effect of creep feeding in solving the problem of a forage shortage will be small.

Fall calving herds facing severe forage shortages may consider weaning calves immediately. Weaned calves could be sold or

ownership retained in drylot conditions on the ranch or sent to a feedlot.

Although early-weaning is certainly not recommended as standard practice, it can provide an alternative in certain situations such as drought, when large amounts of purchased forage would be necessary to maintain a cow herd through to normal weaning time or when cows are already too thin to rebreed. Early-weaned calves can be efficiently raised to a normal weaning weight with minimal labor and facilities.

CULL POORER PRODUCING COWS

Submitted by Kent C. Barnes

Many producers are currently being faced with limited forage availability due to drought and/or fire. One of the first management tools that should be evaluated for cow/calf producers is to cull poorer producing cows. This option can capture their value at a time in the cattle cycle when the prices for cows and culled replacement heifers are fair, while allowing for some capital investment to be used when cattle prices are considerably lower and forage supplies are more plentiful.

Below is a suggested order of culling when facing diminishing forage supplies:

1. Open (non-pregnant) old cows
2. Open replacement heifers
3. Old cows with unsound mouth, eyes, feet, legs and udder
4. Open cows of any age
5. Thin cows over 7 years of age (BCS < 4)
6. Very late bred 2 year olds

The first two items on the list are automatic culls in any forage year. Old open

cows are not worth keeping through a low-forage, expensive feeding period. Replacement heifers that were properly developed and mated to a fertile bull or in a well organized AI program should be pregnant. If they are not bred, there is a likelihood that they are reproductively unsound and should be removed from the herd while still young enough to go to the feedlot and grade choice with an A maturity carcass. The more difficult decisions arise when the producer is low in forage and feed supplies and he/she feels the need to cull cows that have been palpated and found pregnant. That order of culling starts with line 5 on our culling order. This is necessary only when grass and feed supplies are very short. The thin older cows are going to require additional feed resources to have a high probability of being productive the following year and the late bred 2 year-olds are least likely to have long-term productivity in your herd.

Source: Glenn Selk, OSU Department of Animal Science Website (www.ansi.okstate.edu/) Cows and drought.

SERIES: DROUGHT AND LIVESTOCK WATER

Mitch Fram

Note to Educators: Much of the following material appeared in the last edition of Timely Topics. Some new material has been added, and the paper has been split into shorter stand-alone articles more suitable for newsletters or local newspaper columns. There are five articles. Feel free to recombine them or change the order as you see fit.

I. DROUGHT AND LIVESTOCK PONDS

Livestock ponds in most regions of the state remain well below optimum water levels.

As the weather warms this spring and summer, cattle will wade in many of these ponds. Deposited manure and accompanying pathogens, ammonia and nutrients will concentrate in ponds which are low and not being flushed by normal spring rains. The intermediate rains we've had in some areas, one-half to one inch, make matters worse by washing accumulated waste and sediment off of overgrazed pastures into ponds.

The effect of these unwanted inputs to stagnant ponds is what we often call "water fouling." Bacterial and algal growths, as well as high ammonia and sulfide concentrations in bottom mud, make the water so pungent that cattle may not drink enough to meet their daily needs if ponds are their only source.

A couple of livestock diseases are particularly associated with water fouling. Mastitis may spread through wading in fouled ponds. While dairymen regularly observe and test for mastitis, cow-calf producers may never notice it. However, it can affect daily gain in calves. Leptospirosis is a bacterial disease spread in the urine of infected animals. Cattle can acquire the infection from ponds where infected animals have been wading and urinating.

Of course, dehydration due to low water intake from fouled ponds can also be considered a disease, even when not accompanied by infection or toxicity.

Another problem that arises each summer in a few livestock ponds is algal toxicity. Under certain conditions, species of blue-green algae produce substances which are severely toxic to cattle and other animals. These situations are rare, but they usually occur during hot, dry weather in mid- to late summer in ponds with high inputs of nutrients, particularly phosphorus. Symptoms of blue-green algae toxicity include ataxia,

convulsions, bloody diarrhea and sudden death. Blooms of blue-green algae can sometimes be recognized when gentle winds concentrate them near the surface along the downwind shore. They appear as a paint-like scum, usually green to bluish in color. It is best to observe ponds in the early morning when the sun is low, before very high winds occur. The appearance of a bloom does not necessarily mean the water is toxic, but shifting livestock to an alternate source of water is recommended. The presence of dead wildlife near a pond (small mammals, turtles, frogs, etc) should especially raise suspicions of a toxic bloom.

II. WHAT TO DO ABOUT LIVESTOCK PROBLEMS FROM FOULED PONDS

Recent drought conditions have left many livestock ponds low. Low ponds, warm weather and wading cattle combine to increase the risk of “water fouling”. This can cause cattle to consume less water than they need, reducing gain. Fouled water also has the potential to transmit bacterial diseases and promote toxic algae blooms.

When disease symptoms are present that have no ready explanation and a water problem is suspected, a veterinarian should be called for diagnostic help before sending water samples off for testing. There is no single test for all water quality problems, and random testing for toxic compounds is usually fruitless and very expensive.

If signs of a blue-green algae bloom are present, there is some risk of cattle toxicity. It is advisable to restrict cattle access to the pond, or at least block off their access to the downwind end, until conditions improve. Producers can submit a quart sample of pond water from the area of the bloom to the county OSU Extension Center for referral to the OSU Animal Disease Diagnostic Lab. The lab will determine only the presence of blue-green

algae, not the toxicity of the water. The cost is \$10. Copper-containing herbicides such as copper sulfate can help control blue-green algae and other types of algae. However, if not applied correctly, any herbicide can cause fish kills due to rapid decay of plants and depletion of oxygen in the water. Copper can be directly toxic to fish. Contact County Extension Agriculture Educators for advice on algae and aquatic weed control.

The best testing tools for water fouling are your nose and eyes. If the water smells and looks nasty, it very likely is not optimal for your livestock, and will probably cause inadequate water intake if it is the only source.

A general livestock water test is available from the OSU Soil, Water and Forage Analytical Lab for \$6. Bring a pint sample to the county Extension office. The test covers pH, nitrates and total dissolved salts in the water. A pond that is low due to evaporation may have elevated levels of salts and - if the water is also fouled due to wading - high nitrates. The lab report will indicate if the water meets recommended livestock standards for the tested items.

If ponds are to remain the main source of water, the best long-term solution to water fouling is to permanently fence off the pond or at least restrict livestock access to a small area. In-filled ponds should be cleaned out to restore banks and storage capacity and then retrofitted with facilities to use the water away from the pond.

In the short term, water fouling raises the immediate need to look for alternate sources of livestock water.

III. ALTERNATE WATER SOURCES FOR LIVESTOCK

As ponds become low, water may become unacceptable for livestock use due to water fouling, which can compromise production and livestock health. Alternate water sources need to be considered. These can include:

- Using municipal or rural water systems
- Using an existing well or drilling a new one
- Pumping water from adjacent ponds or streams
- Hauling water

All of these options have advantages and drawbacks. Municipal or rural water is high in quality, but can be costly. A new tap fee may be required. Municipal water may entail an additional sewer fee, even though household sewage volume does not increase.

Water yield from an existing well should be evaluated carefully in comparison to livestock water demand. A herd of 30 cows could need upwards of 750 gallons per day in hot weather. If the well yield is marginal, nighttime pumping and extra storage capacity may be needed.

Drilling new wells can be a risky and expensive proposition, depending on the location. Judge the estimated cost of a well against the cost of 10 years of rural or municipal water bills or building a new pond. Experienced neighbors and local well drillers can assist in evaluating the likelihood of getting a good well. Information on groundwater, and a search of well drillers' logs by county or legal description can be found online from the Oklahoma Water Resources Board at <http://www.owrb.state.ok.us/supply/index.php>. Many records on this website appear incomplete, but it may be worth calling the

OWRB to request more information on individual well records.

It may be possible to pump or siphon water from a nearby stream or pond that has good quality water. Gasoline, diesel and solar pumps are alternatives if access to electric power is unavailable. Again, setting up a reliable system will entail significant expense.

For the above options, be sure to consider adequate sizing and freeze-proofing of water troughs, as well as "cow-proofing" floats or other water level control devices. It is especially critical to plan for enough space around a trough, to avoid jostling, fighting and damage to facilities. A good general source of information is a short fact sheet from Clemson University Extension, Alternative Water Strategies for Livestock, by William R. (Rusty) Thomson, available online at <http://www.clemson.edu/laurens/local/water.pdf>.

Another useful publication is Pumping Water from Remote Locations, by Lori Marsh, Extension Engineer, Virginia Tech Publication Number 442-755, May 2001. It is available online at <http://www.ext.vt.edu/pubs/bse/442-755/442-755.html#L12>. This publication contains detailed information on required watering space, flow rates and reserve capacity needed for watering cattle. Also included are pump-sizing and piping tables, energy cost calculations, and details on alternative power sources such as solar and wind.

As for hauling water, that 750 gallons a day required for 30 cows in hot weather can add up to a daunting task which should be reserved only for emergencies. Thomson also reminds us to be careful about choosing tanks to haul livestock water. Tanks that have been used for fuel or chemicals should especially be avoided.

IV. INCREASING THE WATER STORAGE EFFICIENCY OF YOUR POND

The recent drought is causing many producers to consider the storage capacity of their livestock ponds. Building more ponds is an option, but there are some things that can be done in the medium and long term to increase the water available from existing ponds. Many of the following ideas come from Ken Williams, of Langston University. They are also available on the website, <http://www.luresext.edu/aquaculture/new%20pond%20management.htm>.

- Deepen shallow areas while ponds are low. Consider a total cleanout if the pond can be emptied.
- Fence off renovated ponds to restrict cattle access. Unrestricted access and wading leads to shoreline erosion, in-filling and loss of storage.
- Manage the watershed to reduce sedimentation and in-filling. Maintain good cover on pasture; divert or buffer runoff from heavy livestock use areas and plowed fields.
- If sediment from the watershed cannot be controlled by owner management, consider constructing a sediment retention basin above the main pond. Contact NRCS for design information.
- Avoid and repair leaks: Trap out muskrats or other burrowing animals. Treat any small leaks early, to prevent much greater expense and water loss as leaks enlarge. The website cited above has advice on leak repair.
- Do not permit trees to grow on or near pond dams. Trees transpire large amounts of water in hot weather.

Moreover, trees on pond dams often cause leakage due to roots creating channels in the soil. Small trees growing on dams can be removed. However large trees over a foot in diameter should probably be left in place, since allowing their roots to decay will speed the creation of leaks.

- Consider increasing the catchment area contributing to a pond. This can be done by creating small berms angling gently upslope and away from the pond dam, to intercept runoff that would otherwise bypass the dam. This practice should be discussed with the Natural Resources Conservation Service (NRCS) first, as there is a risk of exceeding the design capacity of the pond. Berms can be created with a single-bottom plow, throwing soil downslope from a six-inch furrow. Re-establish grass cover quickly on exposed soil.
- Plant windbreaks across path of prevailing summer winds to reduce pond evaporation. Locate trees well away from pond levees to avoid root-induced leakage.

V. A LONG-TERM LOOK AT YOUR LIVESTOCK PONDS

Do you think of a pond as a routine expense for a water source, or rather as a capital investment in your farm or ranch? If you add a pond and its water management system to the farm's cost basis, you can certainly deduct it from your capital gain when you sell the property. With this in mind, wouldn't it pay to do it right and maximize both the life of the investment and its contribution to your property value?

Most ranchers are well aware of cattle impacts on pond banks: bare, compacted soil, deeply incised trails, dam slopes caving in at water's edge, and muddy, manure-laden bogs in the flat areas. Until the dry weather hits, they may be less aware that all of that destabilized soil has simply gone to fill in the pond and reduce its storage capacity. The recent drought has been an eye-opener for many, as they look at the shallow, fouled water and realize how the capacity of their ponds has declined over the years. Improved pond management not only provides better water for livestock over a longer period, it can also turn an eyesore into a pleasing, high-value part of the landscape, with additional recreational opportunities.

Many ponds have been cleaned out over the winter, and some new ones have been built. To maximize a pond's productive life and enhancement of property value, the first priority should be to restrict or eliminate open cattle access to the water. Planning for this should ideally begin before construction.

First, for new ponds, always consult with the county Natural Resources Conservation Service (NRCS) office. They can help locate the best site, lay out the pond, evaluate soils for water tightness and design dams and piping systems that will promote maximum useful life and quality stock water at a reasonable cost. Don't be tempted to cut corners on the advice of the neighbor with the 'dozer down the road. NRCS publishes an excellent 95-page booklet, [Ponds - Planning, Design, Construction](#). It is available free at most NRCS offices or can be downloaded at: <http://landcare.sc.egov.usda.gov/product.asp?ID=115>.

There is generally no good reason to build a new livestock pond without through-the-dam piping. Water can be gravity-fed to a remote trough or to a freeze-proof tank in the

outside toe of the dam. Such systems enable the complete, permanent fencing of the pond and a reliable supply of uncontaminated water. The small added expense for plumbing and troughs will pay off manyfold in extended pond life, livestock health and never having to chop ice!

Existing ponds

Cutting through an existing dam to install piping can be somewhat risky. Compromised dam cores will need to be restored and anti-seep collars installed around pipes to prevent leakage. On the other hand, if trees have been allowed to grow on the dam or leakage is occurring, this would be a good excuse to re-build the dam and install piping. Again, refer to NRCS for advice.

An alternative for otherwise adequate ponds is the use of fencing to restrict cattle access to all but a limited area of the pond. This involves less expense but usually more maintenance. One method involves using a solar-powered electric fence mounted on floating 2" PVC pipes surrounding the water access point. The advantage of this system is that it moves up and down with pond water levels. Instructions are available from County Extension offices.¹ Limited access can also be achieved using livestock paneling and T-posts to surround the watering area, but these may have to be moved as water levels fluctuate. Either way, water access points need to be of adequate size to prevent excessive jostling among cattle. These areas should also be reinforced well into the pond with geo-textile mat fabric covered by crushed rock, to prevent cattle from bogging down in mud.² Similar reinforcement is recommended for any heavy-use water access area, including around water troughs.

Finally, an existing pond can be fenced off and the water drawn off by pump or siphon

to troughs. A good source of information on water handling is Pumping Water from Remote Locations, by Lori Marsh, Extension Engineer, Virginia Tech Publication Number 442-755, May 2001. It is available online at <http://www.ext.vt.edu/pubs/bse/442-755/442-755.html#L12>.

Consider stocking your pond!

Whatever choices you make to improve pond management and water quality, don't forget the opportunities you open up for multiple uses - swimming, fishing and wildlife. For example, the Oklahoma Department of Wildlife Conservation (ODWC) will provide fish at no charge for stocking ponds that are certified free of existing fish populations. You will not be required to open up fishing to the public. For information call your local Game Warden or contact the ODWC Fisheries Division at (405) 521-3721. Your grandkids will appreciate it.

¹ *The fact sheet, "Constructing a Floating Electric Fence for Stock Watering Ponds", by Marley Beem is available from the author in the OSU Forestry Dept. or from Mitch Fram.*

² *Geotextile fabric is available from the Delaware Conservation District for \$1.25/sq.yd.*

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