IS IT TIME TO RE-STOCK?

Ballroom C

Speakers:

Hugh Aljoe, Chuck Coffey, and Steve Swigert

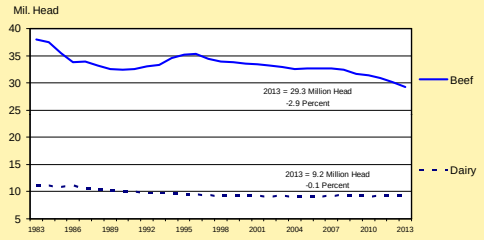
Noble Foundation

Are Your Finances Prepared?

Steve Swigert
Agricultural Economics Consultant

THE SAMUEL ROBERTS NOBLE FOUNDATION

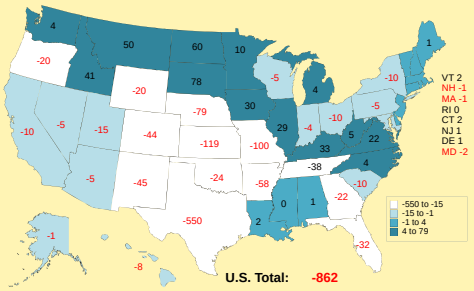
JANUARY 1 COW INVENTORY
U.S., Annual



C-N-02
02/04/13

Livestock Marketing Information Center
Data Source: USDA-NASS

CHANGE IN BEEF COWS NUMBERS
JANUARY 1, 2012 TO JANUARY 2013
(1000 Head)

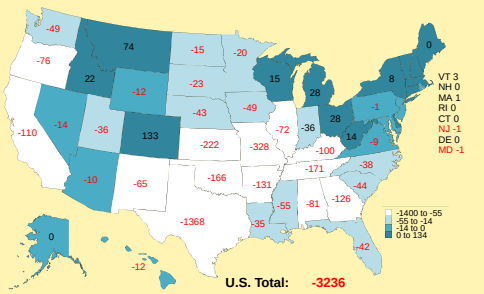


U.S. Total: -862

02/04/13

Livestock Marketing Information Center
Data Source: USDA-NASS

CHANGE IN BEEF COWS NUMBERS
JANUARY 1, 2003 TO JANUARY 2013
(1000 Head)



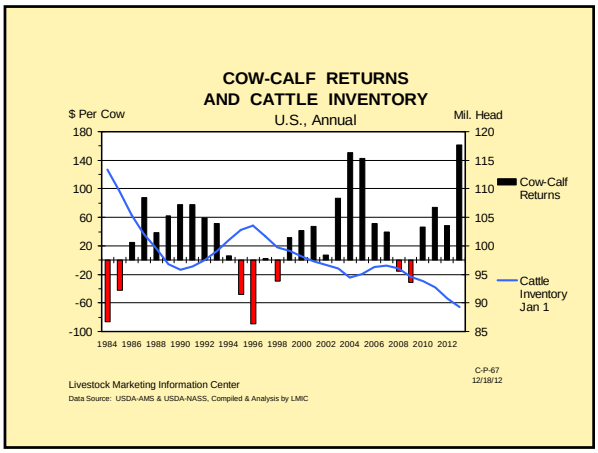
U.S. Total: -3236

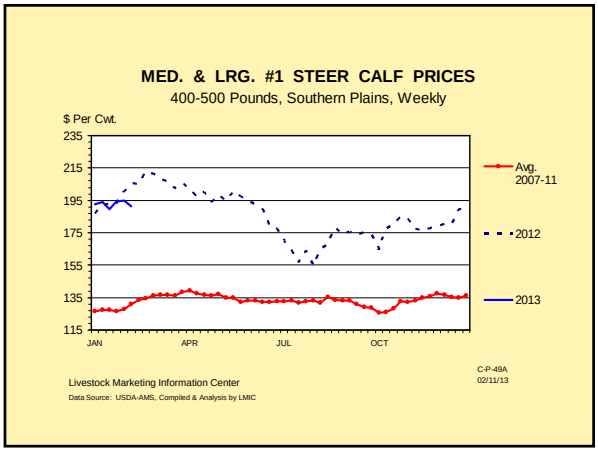
Livestock Marketing Information Center
Data Source: USDA-NASS

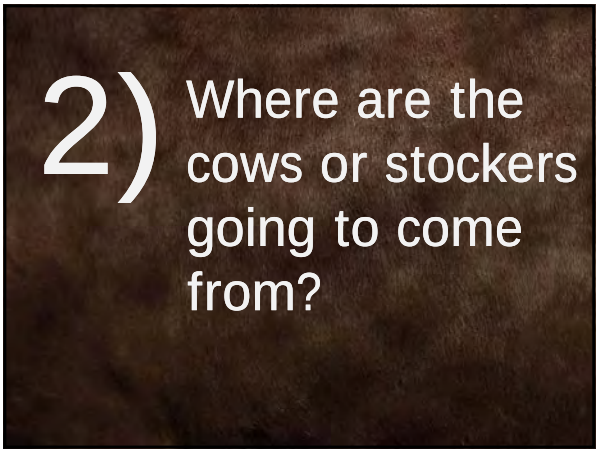
02/04/13

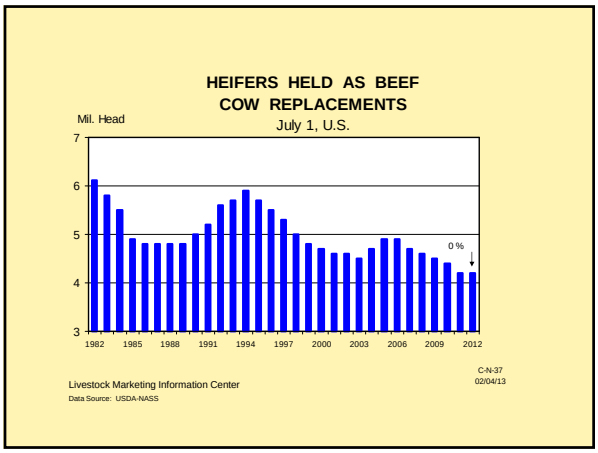
4 Questions that need to be answered

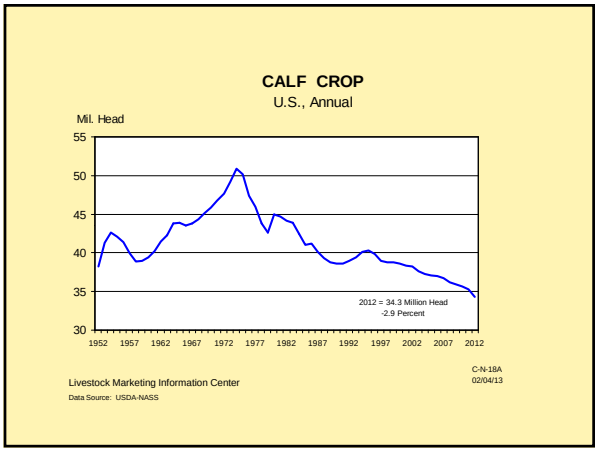
1) What are you going to buy?

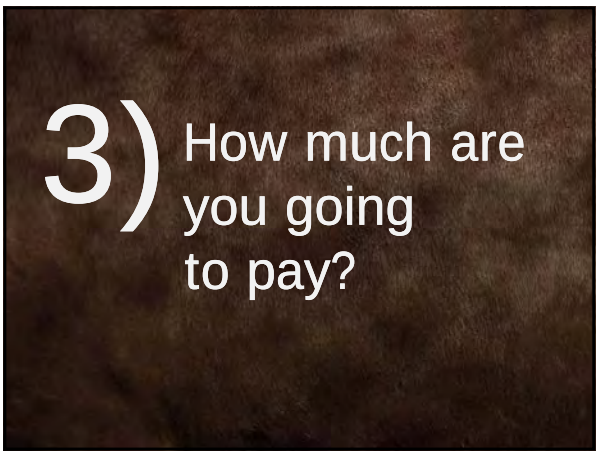

COW-CALF RETURNS
AND CATTLE INVENTORY
U.S., Annual
$ Per Cow
Mil. Head
180
140
100
60
20
-20
-60
-100
120
115
110
105
100
95
90
85
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012
Cow-Calf Returns
Cattle Inventory Jan 1
C-P-67
12/18/12
Livestock Marketing Information Center
Data Source: USDA-AMS & USDA-NASS, Compiled & Analysis by LMIC


MED. & LRG. #1 STEER CALF PRICES
400-500 Pounds, Southern Plains, Weekly
$ Per Cwt.
235
215
195
175
155
135
115
JAN
APR
JUL
OCT
Avg. 2007-11
2012
2013
C-P-49A
02/11/13
Livestock Marketing Information Center
Data Source: USDA-AMS, Compiled & Analysis by LMIC


2) Where are the cows or stockers going to come from?


HEIFERS HELD AS BEEF
COW REPLACEMENTS
July 1, U.S.
Mil. Head
7
6
5
4
3
0 %
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
C-N-37
02/04/13
Livestock Marketing Information Center
Data Source: USDA-NASS


CALF CROP
U.S., Annual
Mil. Head
55
50
45
40
35
30
2012 = 34.3 Million Head
-2.9 Percent
1952
1957
1962
1967
1972
1977
1982
1987
1992
1997
2002
2007
2012
C-N-18A
02/04/13
Livestock Marketing Information Center
Data Source: USDA-NASS


3) How much are you going to pay?

Prices needed to return 3% on a $1,800 bred heifer

$500 Cow Cost	$145	525 lb calf
$600 Cow Cost	$163	525 lb calf

Prices needed to return 3% on a $2,000 bred heifer

$500 Cow Cost	$152	525 lb calf
$600 Cow Cost	$171	525 lb calf

Knowing Your Value of Gain For Stocker Cattle

Steer Value of Gain 2/18/12

520 lbs	$1.83/lb		$951
		$.41 VOG	
620 lbs	$1.60/lb		$992
		$.51 VOG	
728 lbs	$1.44/lb		$1048
		$.92 VOG	
825 lbs	$1.38/lb		$1138

305 lbs $187

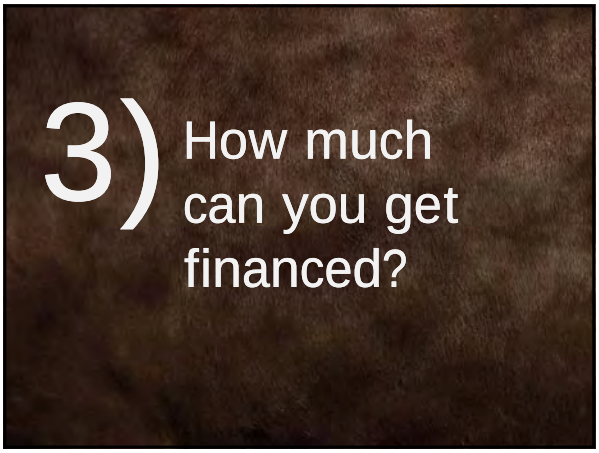
$.613 Total VOG

Heifer Value of Gain 2/18/12

530 lbs	$1.57/lb		$832
		$.58 VOG	
633 lbs	$1.41/lb		$892
		$1.08 VOG	
724 lbs	$1.37/lb		$991
		$.51 VOG	
808 lbs	$1.28/lb		$1034

278 lbs $202

$.726 Total VOG



Conditions-

- Interest Rates
- Term
- Collateral

Cash Flow

Equity Requirement

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Measuring Rainfall and Forage Production to Manage Stocking Rates

The adage "you cannot manage what you do not measure" has many applications and it applies to stocking rate, or more accurately, carrying capacity. However, in the management of beef cattle operations, carrying capacity has traditionally received little attention. There are several factors for this including the development of rapidly growing, fertilizer-efficient introduced grasses, cheap fertilizer, cheap hay, and several decades of good rainfall beginning in the early 1980's. Fertilizer and hay are now much more expensive; and many producers are no longer applying it as in the 1980s. In the last decade, rainfall has become less dependable, and during the last two years we have experienced drought conditions unmatched since the 1950s. In spite of the changing conditions, most producers were reluctant to adjust stocking rate until forced to do so because of the recent drought conditions; and even now few have begun monitoring much less managing carrying capacity. Based on long-term climate forecasts, we should expect a higher probability of drought. Now is the time to begin active management of the carrying capacity and thus your stocking rate.

The question then is "Where to begin?" A good place to start is monitoring monthly rainfall on the ranch using a "Water Year" table, comparing it to the long-term monthly average (Table 1). By comparing the actual monthly rainfall to the long-term average, a producer can determine early in the growing season (and throughout) the trending moisture conditions. The Water Year Rainfall Table for an operation allows a producer to determine the percentage above or below the long-term average that the actual precipitation is at the end of each month, and thus the difference indicating approximately how much to adjust the stocking rate during the growing season (assuming the producer is stocked for an average year).

Table 1. Water year rainfall table created in an Excel spreadsheet

Water Year Rainfall for South Central Oklahoma

	Local Long-Term Monthly Rainfall			2011-2012 Water Year Monthly Rainfall				2012-2013 Water Year Monthly Rainfall			
Month	30 year average	cumulative total	% 30 year average	2011-2012	cumulative total	% 30 year average	variance from average	2012-2013	cumulative total	% 30 year average	variance from average
	inches	inches	percent	inches	inches	percent		inches	inches	percent	
October	4.12	4.12	10	2.07	2.07	5	-5	1.54	1.54	4	-7
November	2.89	7.01	18	6.74	8.81	22	5	0.54	2.08	5	-12
December	2.44	9.45	24	2.05	10.86	27	4	1.72	3.80	10	-14
January	1.84	11.29	28	4.26	15.12	38	10	1.84	5.64	14	-14
February	2.2	13.49	34	1.27	16.39	41	7	1.83	7.47	19	-15
March	3.4	16.89	43	5.79	22.18	56	13		#VALUE!	#VALUE!	#VALUE!
April	3.61	20.5	52	2.77	24.95	63	11		#VALUE!	#VALUE!	#VALUE!
May	5.47	25.97	65	2.12	27.07	68	3		#VALUE!	#VALUE!	#VALUE!
June	4.47	30.44	77	3.30	30.37	77	0		#VALUE!	#VALUE!	#VALUE!
July	2.45	32.89	83	0.7	31.07	78	-5		#VALUE!	#VALUE!	#VALUE!
August	2.52	35.41	89	2.13	33.2	84	-6		#VALUE!	#VALUE!	#VALUE!
September	4.24	39.65	100	2.27	35.47	89	-11		#VALUE!	#VALUE!	#VALUE!
	39.65			35.47							
					Updated	2/21/2013					

There are several key elements in a Water Year Rainfall Table. The “water year” begins with October and ends with September. This is consistent with the Drought Monitor indices as October marks the end of the growing season and is typically the month in which the soil profile begins to recharge. The amount of moisture that occurs between October and March is usually a good indicator of the potential of the type of spring and growing season to expect. The rest of the table is broken into 3 areas: the long-term (or 30-year in this example, which has a higher rainfall average than the 100-year) monthly rainfall averages, the previous water year monthly rainfall averages, and the current water year monthly rainfall averages. Within each of these areas, the rainfall is added cumulatively and then the variance from the long-term average is calculated. It is the variance that is of most significance especially early in the growing season as it provides a producer a numeric value of the degree to which the growing season varies from ‘average’ as well as a quick look at the previous year’s information. Producers often measure rainfall, and the Water Year Rainfall Table is a tool in which the collected information can be used to assist in management decisions. Additionally, the Water Year Rainfall Table can be compared to the Drought Monitor information (both current conditions and the 90-day forecast) to determine how similar your operation’s moisture conditions are to the regional conditions.

One issue to consider when constructing a Water Year Rainfall Table is whether to use the 30-year or the long-term (i.e., 100+ year) averages in the first area of table. If you have traditionally stocked at the carrying capacity more reflective of the past 30 years and want to compare the variance from the climate you have become accustomed to, then the 30-year information may best suit your individual needs. It will provide a more extreme variance during drought years as the annual rainfall for the past 30 years has averaged 4-5 inches greater than the 118-year annual rainfall average. If you have adjusted your stocking rate to reflect the lower carrying capacity observed the previous 2 years and you are prepared to manage relative to the long-term annual rainfall, the 118-year monthly rainfall averages will provide a more accurate variance for managing stocking rate into the future. It is often more difficult to locate the long-term rainfall information. However, a reliable source for such information is the County Soil Survey Books (especially if published prior to the 1980s). Although dated, the reported long-term monthly rainfall averages are more historically accurate than the more recent 30-year averages.

The second variable to measure is actual forage production. There are several methods to assess forage production, and depending on the type of management employed for an operation, the best method will vary. Typically, forage production estimates require some ability and experience in visual assessment which is one of the reasons it is not a regular management practice. However, usable estimates of production can be developed if you have a reasonable understanding of forage growth by forage type and expected production by soil type. Estimates of forage production need to be determined at critical dates in the operational plan. A few suggested dates for estimating forage production for the Southern Plains region are June 1, July 1, September 1, and frost when respectively about 30%, 65%, 90%, and 100% of annual perennial warm season grass production is expected to be produced. If production is behind expectations and the moisture conditions are not expected to improve, a plan needs to be developed to adjust the stocking rate by the difference between expected and actual production.

The Forage Assessment Form is the tool needed to estimate forage production. There are many different ways to construct a Forage Assessment Form. Tables 2 and 3 provide two different examples of forage production assessments for an identified critical date (i.e., June 1). In Table 2, a reserve herd day approach is used in the assessment, which is often easier if practicing managed rotational grazing, and Table 3 illustrates an assessment method using estimates of forage production by pasture. Notice that both methods compare actual forage production to the expected production at the assessment date. The critical information to begin includes: identification of critical assessment dates, an estimate of forage demand at critical date assessment and anticipated for the year, an estimate of the total amount of production anticipated for the grazing period (normally a year for cow-calf operations), and an estimate of the amount of forage produced (on-hand, grazed and hayed) at the time of assessment. All forms will include pasture inventory information such as pasture ID, forage type, and estimated production. Notice that both tables include livestock inventory information used to determine livestock demand for the year and up to the date of assessment. For these examples, we make the assumption that the grazing season begins April 1st as the predominant forages are warm season perennial grasses.

Tables 2 and 3 contain charts with the livestock demand information, grazing and hay reserve herd days, and the forage production summary and critical date production values. The livestock demand is listed in pounds of dry matter and based on a daily demand of 26 pounds per 1000-pound animal equivalent. The "Grazing Demand to Date" chart indicates 2 months grazed accounting for the grazing for the months of April and May.

Table 2. Example of a Critical Date Forage Assessment Form using the reserve herd day approach (in an Excel spreadsheet).

Forage assessment form using reserve herd days (RHDs)

Assessment Date 1-Jun-13

ANNUAL ESTIMATE of LIVESTOCK DEMAND

			Annual Livestock Demand			
Cattle	Qty	Weight	per Day	Days/Year		per Year
Cows	84	1200	2,621	365		956,592
2-year old cows	12	1000	312	365		113,880
Yearling heifers	15	800	312	365		113,880
Bulls	5	1600	208	365		75,920
Weaned steers	45	600	702	90		63,180
Weaned heifers	45	600	702	90		63,180
			4,857			**1,386,632**

GRAZING DEMAND to DATE

Grazing Demand			Livestock Demand		Months	Total Grazing
Cattle	Qty	Weight	per Day	per Month	Grazed	Demand
Cows	84	1200	2,621	78,624	2	157,248
2-year old cows	12	1100	343	10,296	2	20,592
Yearling heifers	15	900	351	10,530	2	21,060
Bulls	5	1600	208	6,240	2	12,480
Weaned steers	n/a					-
Weaned heifers	n/a					-
			3,523	**105,690**		**211,380**

FORAGE INVENTORY TO DATE (GRAZED + RHDs)

Grazing RHDs					Estimate
		Total	Reserve		Forage
Pasture	Forage	Acres	Days	Cattle	Reserve
1,4,5,8	Bg	80	21	Cows	55,037
2, 6	Bahia	40	20	2-yr	6,864
3	Bg	20	30	Yrlg hfr	10,530
7	Bg	20	7	Cows	18,346
9	Bahia	20	2	Cows	5,242
10	annuals	20	21	Bulls	4,368
				LBS forage grazing	**100,386**
				Reserve grazing days	**28**
				Reserve grazing months	**0.9**

Hay	(acres)	(qty/ac)	Bales	Weight	Reserve
Hayfield	25	1	25	1200	30,000
Ryegrass hay			58	1000	58,000
				LBS hay	**88,000**
				Reserve hay days	**25**
				Reserve hay months	**0.8**

Forage Production to Date	
Graze+RHD's	% Annual
Grazed	211,380
RHDs	100,386
Hay	88,000
Total	399,766
% of Annual =	**29**

Critical Dates & Expected Production		
Date	% Annual	Total lbs
1-Jun	30	415,990
1-Jul	65	901,311
1-Aug	90	1,247,969
1-Nov	100	1,386,632

In Table 2, the forage inventory is represented in terms of reserve herd days (RHDs), which are then converted to pounds of dry matter production. RHDs represent the estimated number of days that the herd can graze in the listed pastures if all plant growth ceased immediately. This value is multiplied by the daily demand for the respective class(es) of cattle using the pastures. Hay that has been produced during the growing season is accounted for as well. In the "Forage Production to Date" chart, the production is totaled for Grazing Demand, Grazing RHDs, and Hay, and then divided by the Annual Estimate of Livestock Demand to determine the Percent of Annual Production; the 29% value in the "Forage Production to Date" chart. The "Critical Dates & Expected Production" chart lists the critical dates, percent of annual production expected by that date and the pounds of production that represents based on annual livestock demand. On June 1 in this example, the assessment indicates that forage production for the operation (29%) is tracking close to the expected production (30%) at the critical assessment date. If the assessment indicated greater than 5% deficiency, the Water Year Rainfall chart indicates below average precipitation, and the Drought Monitor does not provide a favorable forecast, a producer should be contemplating drought management strategies. Keep in mind in this example, the expected production is based on the existing herd and not estimated forage production. This method works better if conservatively stocked than if stocked more aggressively.

The Critical Date Forage Assessment Form in Table 3 uses forage production estimates by pasture to create a forage inventory at date of assessment and for the year. The "Forage Inventory" chart is listed by pasture and includes the grazing acres and the estimated pounds of dry matter present and expected for the given year. The disadvantage of this method is it requires some experience in estimating forage production. In this example, it is necessary to assign a harvest efficiency value to the total dry matter production as livestock can only harvest 25% to 75% of the available forage. In this example with introduced pasture and rotational grazing, a harvest efficiency value of 65% is applied to total production. A harvest efficiency of 25% is typically used for native grass pastures. Although not necessary for the assessment, the process of determining the total grazed forage for the year provides a good check against annual livestock demand to be certain that livestock demand does not exceed expected forage production.

Table 3. A critical date forage assessment example using forage production estimates by pasture (in an Excel spreadsheet).

Forage assessment form using pasture production estimates

Assessment Date	1-Jun-13

ANNUAL ESTIMATE of LIVESTOCK DEMAND

			Annual Livestock Demand			
Cattle	Qty	Weight	per Day	Days/Year		per Year
Cows	84	1200	2,621	365		956,592
2-year old cows	12	1000	312	365		113,880
Yearling heifers	15	800	312	365		113,880
Bulls	5	1600	208	365		75,920
Weaned steers	45	600	702	90		63,180
Weaned heifers	45	600	702	90		63,180
			4,857			**1,386,632**

GRAZING DEMAND to DATE

Grazing Demand			Livestock Demand		Months	Total Grazing
Cattle	Qty	Weight	per Day	per Month	Grazed	Demand
Cows	84	1200	2,621	78,624	2	157,248
2-year old cows	12	1100	343	10,296	2	20,592
Yearling heifers	15	900	351	10,530	2	21,060
Bulls	5	1600	208	6,240	2	12,480
Weaned steers						-
Weaned heifers						-
			3,523	**105,690**		**211,380**

FORAGE INVENTORY TO DATE and ANNUAL

		Grazing	Production to date			Annual production		
	Pasture	Acres	Est. lbs/ac	Total/pasture	Est. available	Est. lb/ac	Total/pasture	Est. available
	1	45	1200	54,000	35,100	4500	202,500	131,625
	2	85	450	38,250	24,863	2700	229,500	149,175
	3	75	550	41,250	26,813	3000	225,000	146,250
	4	80	600	48,000	31,200	3000	240,000	156,000
	5	85	650	55,250	35,913	2800	238,000	154,700
	6	60	700	42,000	27,300	3300	198,000	128,700
	7	90	750	67,500	43,875	2500	225,000	146,250
	8	65	550	35,750	23,238	3500	227,500	147,875
	9	80	400	32,000	20,800	2700	216,000	140,400
	10	80	400	32,000	20,800	2500	200,000	130,000
		Inventory forage		446,000	**289,900**		2,201,500	**1,430,975**

Grazed forage	211,380
Inventory forage	289,900
Total grazed + inventory	**501,280**

Percent of Annual Production	**35%**

Critical Dates & Expected Production			
Date		% Annual	Total lbs
1-Jun		30	660,450
1-Jul		65	1,430,975
1-Aug		90	1,981,350
1-Nov		100	2,201,500

The “Percent Annual Production” chart is a total of grazed and inventoried forage divided by the estimated total forage available for grazing. It is paired for quick reference with the “Critical Dates & Expected Production” chart comparing actual production with expected. In this example, the percent of annual production at the June 1 assessment date is 35%, slightly ahead of the 30% of expected production for that date. Again, when used with a Water Year Rainfall Table for the operation, and with close observance of the Drought Monitor current conditions and 90-day forecast, a producer can better manage and plan for the remainder of the growing season.

These are just two of many examples of how to create Forage Assessment Forms. Each form should be developed to fit an individual operation. Forage assessments performed routinely at critical dates aid in decision making when issues (or opportunities) are identified early in the planning horizon. Forage Assessment Forms and Water Year Rainfall Tables are two simple tools that allow the progressive producer to proactively monitor the carrying capacity of pastures and manage stocking rate.

Adequate rainfall covers up a lot of poor management practices allowing producers to ignore the management of stocking rate. It often takes extreme circumstances like extended drought before stocking rates are adjusted, but then unfortunately it is usually after the land (forage) resource has been misused to the point that it will take multiple years to recover – *if recovery is even possible*. However, astute managers can distinguish themselves during periods of extended drought by ***managing stocking rates to match carrying capacity*** – using tools to monitor forage production and rainfall. The key to sustaining forage resources for long-term optimization of carrying capacity (regardless of rainfall) is active management of stocking rates.

THE SAMUEL ROBERTS NOBLE FOUNDATION

AG News and Views

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FORAGE

"New normal" rainfall expectations endanger production

by Chuck Coffey / crcoffey@noble.org

The "new normal" can be defined as the period of time from 1981-2010, a span of 30 years, when Oklahoma rainfall was significantly more abundant than it had been in the previous 87 years. Figure 1 depicts yearly rainfall from 1895-2011 for Oklahoma. It also shows us the trends in weather patterns by depicting a five-year rolling average.

Until 1980, wet and dry periods trended in seven- to 10-year cycles with somewhat regular frequency. However, from 1980-2010, the trend remained wet – so much so that if we calculate the average annual rainfall for this period we were 3 inches above our 117-year average of 34 inches. Folks, that is impressive, and I'm not even a climatologist. I first observed this phenomenon occurring back in the 1990s and began writing articles about drought. Just looking at this chart caused me to begin telling people that drought is normal and should be expected 25 percent of the time. What we were experiencing was not "normal" and to prepare to pay the fiddler.

From a livestock grazing perspective, drought can be defined as "slow

Figure 1. 1981 to 2010 – The "New Normal?" – 30 Years

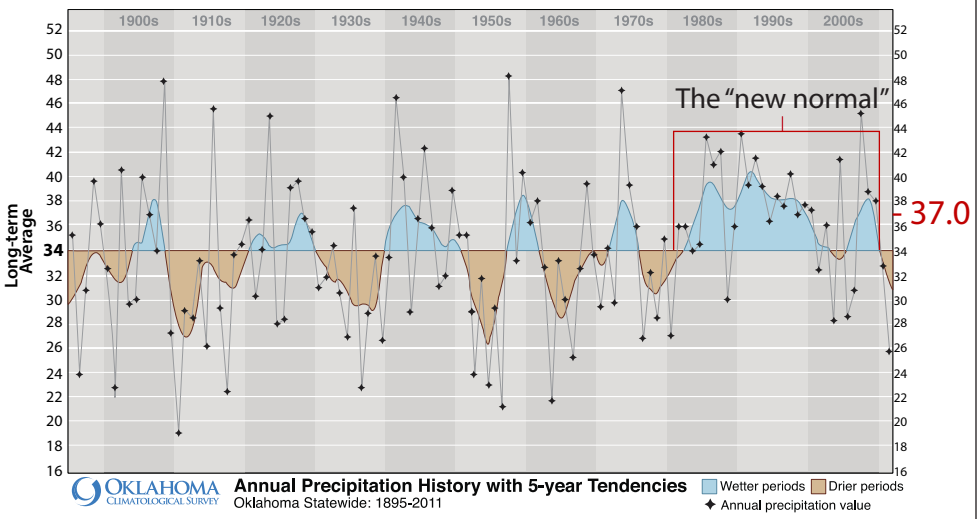
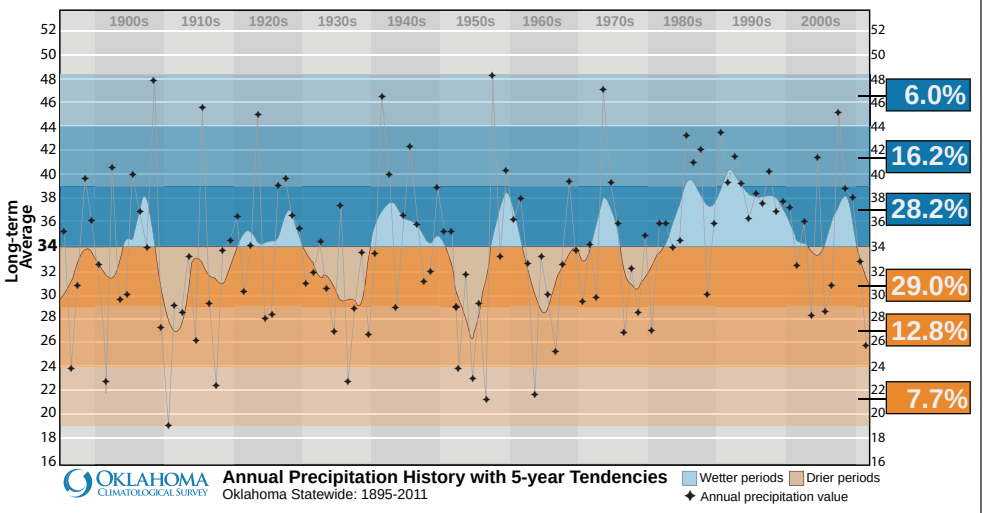


Figure 2. Probability of Rainfall Deviation



plant growth when you expect fast growth" or "no growth when you expect slow growth." If we simply define drought as receiving less than 29 inches of rainfall (greater than 5 inches below average) for Oklahoma, then drought has occurred some 20 percent of the time since 1895 (Figure 2). By this definition, I believe we will see the frequency of drought increase over the coming 20 to 30 years.

It is also worth noting that severe drought in Oklahoma – less than 24 inches of annual rainfall or more than 10 inches below average – has occurred 7.7 percent of the time since 1895. We have not seen this happen since 1963. The drought of 2011 came close with just over 25 inches. What made the drought in 2011 so severe is that it began in the fall of 2010 with a dry winter and continued to stay dry through the spring and summer. We started off on the right foot in 2012, but the rains quit when we needed them the most, in May and June.

Simply put, you better quit thinking animal numbers can rival the capacity of the "new normal" timeframe and adjust your stocking rate to match the long-term average of the last 117 years. In the near term, most of us should consider reducing stocking rates even further due to the severity of stress caused by the drought of 2011 to 2012. The "new normal" was not normal; it was a welcome anomaly and may not occur again in our lifetimes. ■