Drought Update in California
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Drought is a recurring phenomenon characteristic of arid and semi-arid landscapes which challenges the efforts of any who try to develop reliable uses of them. Droughts can be especially devastating to those who are unprepared for them, and some are crippling even to those that are. As stated in the National Drought Forum “Drought has imposed significant costs to the U.S. In the past 30 years, the nation has experienced a growing number of billion-dollar drought disasters. For example, the National Drought Forum of 2012 says that the costs of the 2012 drought in the U.S. will surpass $50 billion”. We are just beginning to realize the costs associated with the current drought in California. A preliminary study from UC Davis estimates economic losses from agriculture, in just the Central Valley alone, will exceed $1.7 billion.

A history of drought in California can be found in the Annual Rangeland Handbook (http://californiarangeland.ucdavis.edu/Annual_Rangeland_Handbook/). The following is a brief summary of drought in California. According to tree ring records there have been multi-decade dry periods in the past 500 years. These records reveal a major dry period from 1760 to 1820 and another drought from 1860 to 1885. Severe droughts in 1850-1851 and 1862-1864, together with other factors, have been implicated in the conversion of the former native perennial grassland to a grassland dominated by annual grasses and forbs. The severe drought of 1862-1865 also contributed to the change of agriculture in California from being dominated by livestock to cropland production. At least eight multiyear periods of low precipitation have occurred in California since 1900. Droughts that exceed three years are uncommon, though occurrences in the past century include 1929-1934, 1947-1950, and 1987-1992. One of the most memorable examples of drought in California was the two year dry period in 1976 and 1977. Precipitation during each of these calendar years, and during the 1976-1977 water year in particular, was extremely low. In these two consecutive years statewide precipitation was ranked among five lowest ever recorded in California. The 1976-1977 drought is notable because of the magnitude of the precipitation deficit and the enormous effect it had on the human population of California.

In some years poor precipitation results in forage production that is 50 percent or more below average. Because the amount and dependability of precipitation increases from south to north and with elevation the frequency of years with forage production less than 50 percent of average varies greatly.
across the state’s Mediterranean-type rangelands. Analysis of annual forage production data from 26 locations in California’s annual rangelands reveal that a 50 percent reduction in range forage production rarely occurs north of Sacramento. Forage losses of 50 percent are more common in the rain shadow of the Coast Range adjacent to the west edge of the San Joaquin Valley.

California’s annual rangeland forage production also varies greatly over short distances due to variations in precipitation, soil characteristics and topography. The coastal areas of a county may have adequate precipitation but drier inland locations may have low precipitation and forage reductions exceeding 50 percent. Data from San Luis Obispo County reveals that forage reductions of 50% or more are less frequent at coastal sites than inland sites.

The current drought in California has placed the majority of the state in the severe or exceptional drought category (US Drought Monitor). Even though this year has received much attention from the media, California has actually been experiencing drought conditions for at least 6 out of the last 8 years (Figure 1). The 2013-2014 water year was exceptionally low in rainfall and snowpack and most reservoirs did not fill to capacity, many communities are demanding water cuts, crops are not being watered, and forage production for livestock was significantly less this year.

Currently, the Central Coast is in the heart of the D4 (Exceptional) drought rating (See Fig. 1). The city of Paso Robles CA, has kept rainfall records since 1887 (Figure 2). The water years 2006-2007, 2008-2009, 2011-2012, 2012-2013 and 2013-2014 were all well below average. Annual forage production has been monitored in San Luis Obispo County since 2001. At these sites, forage losses were well below average during those same years at these sites (Figure 3). Forage losses exceeded 95% for the 2013-2014 growing season (Figure 4). Not only was total production severely reduced, but the growing season was also changed dramatically. There was not enough rainfall for germination until end of February 2014, germination usually occurs by October or November. There was no green feed for livestock until March 2014, five months later than normal. There were some locations with very limited rainfall, of which there was no forage production (Figure 5). Many livestock producers have sold most of their herd, or at least significantly reduced their numbers. The San Luis Obispo County Cattlemen’s Association reported that over 10,000 hd of cows went through the primary local auction yard from October 2013 – March 2014. The normal number would be 1,400 hd. It will take several years to rebuild herds back to normal numbers, and rebuilding will not begin until the rains begin.
Figure 2. Rainfall records from 1887-2014 water year, shows high yearly variations.
Figure 4. Available forage for monitored sites in San Luis Obispo County, CA since 2001. Values represent peak production, late April or early May, with the recommended amount that should be left as residual dry matter subtracted out.

Figure 6. Peak production on California’s annual rangelands, eastern side of San Luis Obispo County. Photo taken on April 28, 2014. This area had less than 2 inches of rainfall and there was no forage for livestock.

Figure 5. Available forage throughout San Luis Obispo County, CA, 2014. Many sites had no available forage (100% loss), overall losses were approximately 95% across all sites.

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Drought Information Resources

General Information and Links to Crop Specific Issues
http://cesanluisobispo.ucanr.edu/Drought_Information/

UC ANR California Institute for Water Resources Drought Information
http://ciwr.ucanr.edu/California_Drought_Expertise/

UC Davis Rangeland Watershed Laboratory Managing Drought
http://rangelandwatersheds.ucdavis.edu/main/drought.html#RancherPerspectives

Coping with Declining Groundwater Levels
CIMIS Drought Tips

Film excerpts from UC Researchers and Academics on a Large Variety of Expert Water and Drought Topics
Insights: Water and Drought Online Seminar Series

Irrigation Scheduling Tools
UC Drought Management-Evapotranspiration Scheduling

Soil Moisture Monitoring
UC Drought Management-Soil Moisture Monitoring

Extension- Soil Moisture Sensors

Drought Strategies
Irrigation Scheduling during a Drought

Camelina and Canola Trials Update
Royce Larsen, UC ANR & Nic George, UC Davis

Biofuels are needed in California to meet the state’s requirements for low carbon fuels under the Low Carbon Fuel Standard. Executive order S-06-06 calls for in-state production of biofuels to add to the state’s economy and meet greenhouse gas reduction goals. Biodiesel also qualifies as an advanced biofuel under the federal Renewable Fuel Standard and demand is expected to increase. California currently has 12 companies producing biodiesel, which would benefit from additional supplies of locally-produced vegetable oils. The production of winter annual oilseed crops to meet this demand will also provide valuable new crop options for California growers across a wide range of locations and differing farming systems. Oilseeds will help diversify farming systems and sustain the profitability of farms.

We started the trials in 2013. This was an interesting year to see how these crops dealt with the drought, figure 1. We had about 6.5 inches of rainfall at the site. Some of the varieties of canola did not make it past the seedling stage. Even though other varieties of Canola did produce pods, there was no seed production at all this year. Interestingly though, we were able to harvest Camelina and production which was about 1500 lbs/ac. This shows that Canola cannot be grown under these severe conditions, like this drought is. However, Camelina did produce a crop under limited rainfall, and may also be a viable alternative for some of our drier portions of the county. There is another year of testing though, before final results will be available.

Plots near Paso Robles: Camelina on left, canola on right
Will We Have a Wet Winter? Are You Ready?
Royce Larsen, UC Cooperative Extension

Currently the EL NIÑO/SOUTHERN OSCIL- LATION (ENSO) DIAGNOSTIC DISCUSSION is- sued by CLIMATE PREDICTION CENTER/ NCEP/NWS and the International Research Institute for Climate and Society (http://www.cpc.ncep.noaa.gov/products/ analysis_monitoring/enso_advisory/ ensodisc.html) shows a 70% chance of EL NIÑO developing this summer, and as high as 80% chance by this coming fall.

Typical El Niño impacts in the U.S. include above-average rainfall in the West and sup- pressed hurricane activity in the East, al- though neither is guaranteed and largely dependent on El Niño’s strength. Hopefully we will have a wet winter, every- one knows we need it. However, if it is wetter than normal this coming year, are you prepared? We have had several “drier than normal” winters now, and many of the streams, roads, and culverts have not had running water for a long time. It is hard to think of doing maintenance during such a severe drought, but it could be extremely beneficial. Are you ready for heavy rains and flooding? Are your culverts clean and free of debris? Are your pas- tures, especially critical areas, covered adequately with RDM (residual dry matter – or old plant material). Are your water bars, rolling dips, berms, etc. maintained properly on your ranch roads? Doing some maintenance now could save a lot of money and time later this fall and winter if the heavy rains do come.

Vintage Photo, California flooding 1940. Courtesy UCANR Repository
Ranching Sustainability Analysis (RSA) Workshop
Thursday August 7, 2014: 8:30 am to 1:30 pm
UCCE Auditorium
2156 Sierra Way, San Luis Obispo

and...
Tuesday August 26, 2014 9:00 am to 2:00 pm
UCCE Cooperative Extension
1432 Abbott St, Salinas

Cooperative Extension Specialists and Advisors, local ranchers, and experts in the industry will define RSA (where it originated and how it works) and talk about its importance, not only for achieving and maintaining a prosperous ranch, but for preserving family values as well. Participants will have an opportunity to fill out the RSA questionnaire.

Featuring a video by Alan Savory:
“How to Fight Desertification and Reverse Climate Change.”

Dr. Jim Oltjen, Animal Management Specialist, UC Davis:
“How to Rebuild Cattle Herds following a Drought”

Central Coast Vineyard Team Representative:
“Positive Points Self Assessment”

Rancher panel discussion topics include:
- RSA Confidentiality & Rangeland Monitoring
- People Relationships
- Ranch Management
- Statewide Perspective

On line registration: http://ucanr.edu/rsaaug2014  Or call 805-781-5940
Cost: $20.00 (Includes Handouts, Continental Breakfast, and Lunch)

For more information on Ranching Sustainability Analysis go to: http://ucanr.edu/rsa