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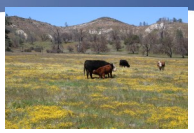

Spring 2020

Livestock, Range, & Watershed

San Luis Obispo, Santa Barbara and Monterey Counties

SAN LUIS OBISPO COUNTY COOPERATIVE EXTENSION

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IN THIS ISSUE:

2020 SOD BLITZ

Due to the direction and guidance from the CDPH on COVID-19 and social distancing the community meeting/ training sessions will not be held but instead there is an online training for this years SOD BLITZ at www.sodblitz.org.

Currently the tree disease Sudden Oak Death (SOD) is found in 15 counties and is currently found at the Monterey/San Luis Obispo County border. Early detection on bay laurel is key, before the infection of oaks and tanoaks, for a successful proactive attempt to slow down the SOD epidemic. In 2019, P. ramorum has been found in three streams (not on landscape vegetation) in San Luis Obispo County, so sampling bay laurel this year is critical.

For more information and to participate in this year's BLITZ please fill out the quick registration, it's easy and free http://ucanr.edu/2020sodblitztraining

Also see:
https://nature.berkeley.edu/matteolab/?page_id=5095

8th California Oak Symposium and Call for Abstracts

The 8th in a series of California Oak symposia will be held during March 22-25, 2021, in San Luis Obispo, California. The theme of the symposium is "Sustaining California Oak Woodlands Under Current and Future Conditions."

Beginning in 1979, there have been a series of seven symposia held every 5 to 7 years. Each symposium addressed the state of our knowledge about the science, policy, and management of California's oak woodlands. Given the risks associated with climate change, conservation of this diverse ecosystem is an especially critical management and policy priority today. Accordingly, the 8th symposium will have plenary sessions that feature presentations on the science of climate change, management of oak woodland under changing environmental conditions, and the maintenance of working landscapes and the essential services they provide to all of us. In addition, a session with invited speakers will describe California oak programs for schools, citizen scientists, and underrepresented groups. Another will feature recent technologies used to increase our understanding of the oak woodland ecosystem and strategies for the application of this information. These two sessions and the three plenary sessions are interspersed with contributed paper presentations on wildlife ecology, oak restoration, oak pests and diseases, fire ecology, and woodland conservation management planning, among others.

As with previous symposia, the 8th will bring together oak scientists, managers, policy makers, and interest groups from throughout the state, and will provide opportunities for field trips to local spots that are expressive of central coast oak management and conservation. For more information, please contact the ANR Program Support Unit. Thank you for your consideration of participating in this important informational event. You can submit an abstract at the following website: https://ucanr.edu/sites/oaksymposium/

Soil Organic Carbon

Scott Devine[1], Anthony O'Geen[1], Han Liu[1], Yufang Jin[1], Helen Dahlke[1], Royce Larsen[2], and Randy Dahlgren[1]. [1]UC Davis, [2]UCANR

Currently, the use of compost to improve soil health and store carbon is being utilized. On the Central Coast, many projects are being started to look at carbon sequestration and improved soil health. A recent study sheds light on the soil organic carbon stocks of our rangelands.

The paper "**Terrain attributes and forage productivity predict catchment-scale soil organic carbon stocks"** was completed recently on the Central Coast**.** Given their importance to both local soil health and global carbon cycles, accurate assessments of soil organic carbon (SOC) stocks are needed at multiple scales. Rangelands cover 54% of California, representing a large stock of SOC, but existing SOC estimates are uncertain.

This study was undertaken to improve our understanding of fine-resolution SOC stocks in complex terrain and provide guidance to rangeland SOC inventories in an annual grassland catchment in California's Central Coast Range. In summary, lower hillslope positions, concave landforms, and enhanced wet-year greenness were associated with more SOC. This study demonstrates that the accuracy of regional-scale SOC mapping of California rangelands benefits from considering microclimatic and topographic controls at the catchment-scale, in addition to broader scale mineralogical and macroclimatic controls identified in previous SOC studies.

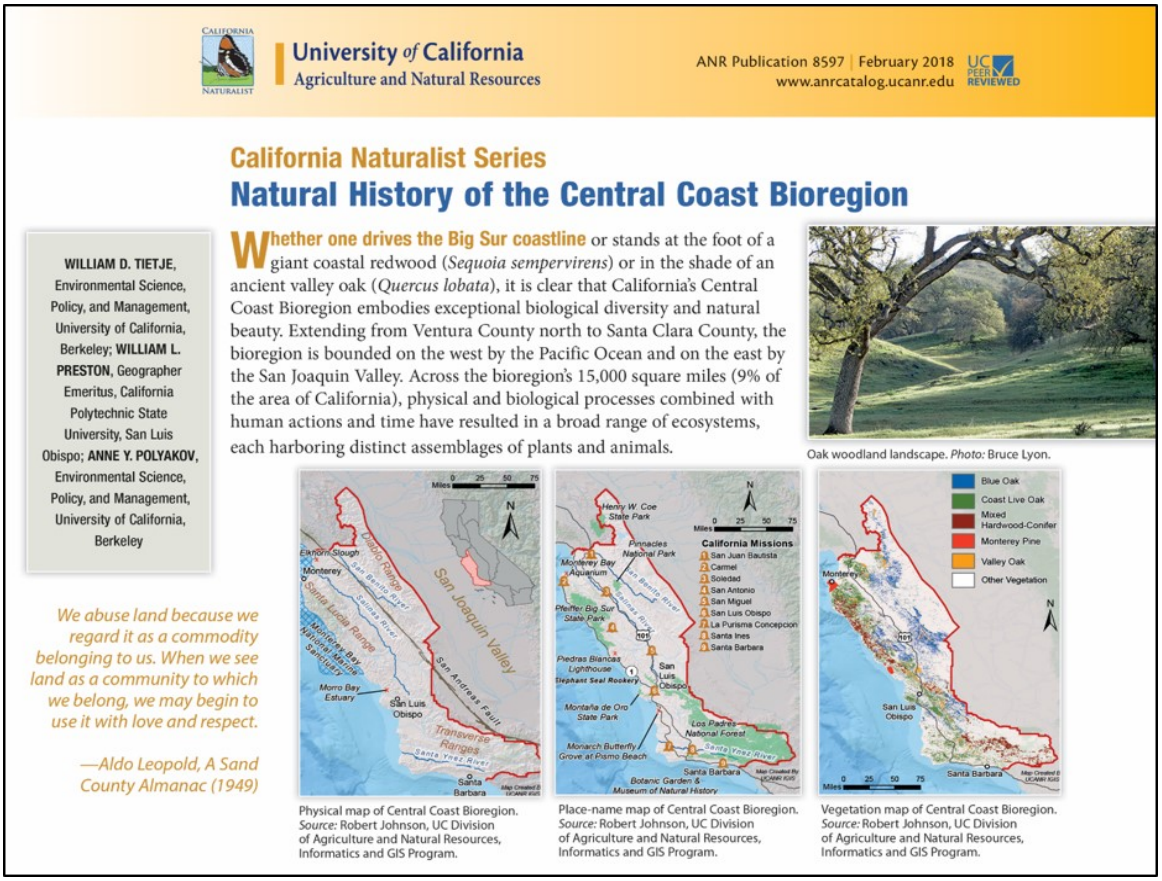
To see the whole article, go to:
https://www.sciencedirect.com/science/article/pii/S0016706119318427?via%3Dihub

Rediscovering California's Central Coast Bioregion

Gregory Ira, Director, UC ANR California Naturalist Program

The publication's lead author, Bill Tietje, with co-authors William Preston, Cal Poly, and Anne Polyakov, University of Washington, created a highly readable and engaging description of the Central Coast Bioregion. "We strived to write in everyday English and create a scientifically accurate presentation." The authors succeeded on both counts by use of plain language, common plant and animal names, and short paragraphs supported with over 65 high-quality photographs, four maps, two diagrams, ten vignettes, and 70 references for further reading.

The Central Coast Bioregion, an area between the Pacific Ocean and the San Joaquin Valley,



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ANR Publication 8597 | February 2018
www.anrcatalog.ucanr.edu

UC PEER REVIEWED

California Naturalist Series

Natural History of the Central Coast Bioregion

WILLIAM D. TIETJE, Environmental Science, Policy, and Management, University of California, Berkeley; WILLIAM L. PRESTON, Geographer Emeritus, California Polytechnic State University, San Luis Obispo; ANNE Y. POLYAKOV, Environmental Science, Policy, and Management, University of California, Berkeley

Whether one drives the Big Sur coastline or stands at the foot of a giant coastal redwood (*Sequoia sempervirens*) or in the shade of an ancient valley oak (*Quercus lobata*), it is clear that California's Central Coast Bioregion embodies exceptional biological diversity and natural beauty. Extending from Ventura County north to Santa Clara County, the bioregion is bounded on the west by the Pacific Ocean and on the east by the San Joaquin Valley. Across the bioregion's 15,000 square miles (9% of the area of California), physical and biological processes combined with human actions and time have resulted in a broad range of ecosystems, each harboring distinct assemblages of plants and animals.

Oak woodland landscape. *Photo:* Bruce Lyon.

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.

—Aldo Leopold, A Sand County Almanac (1949)

Physical map of Central Coast Bioregion. *Source:* Robert Johnson, UC Division of Agriculture and Natural Resources, Informatics and GIS Program.

Place-name map of Central Coast Bioregion. *Source:* Robert Johnson, UC Division of Agriculture and Natural Resources, Informatics and GIS Program.

Vegetation map of Central Coast Bioregion. *Source:* Robert Johnson, UC Division of Agriculture and Natural Resources, Informatics and GIS Program.

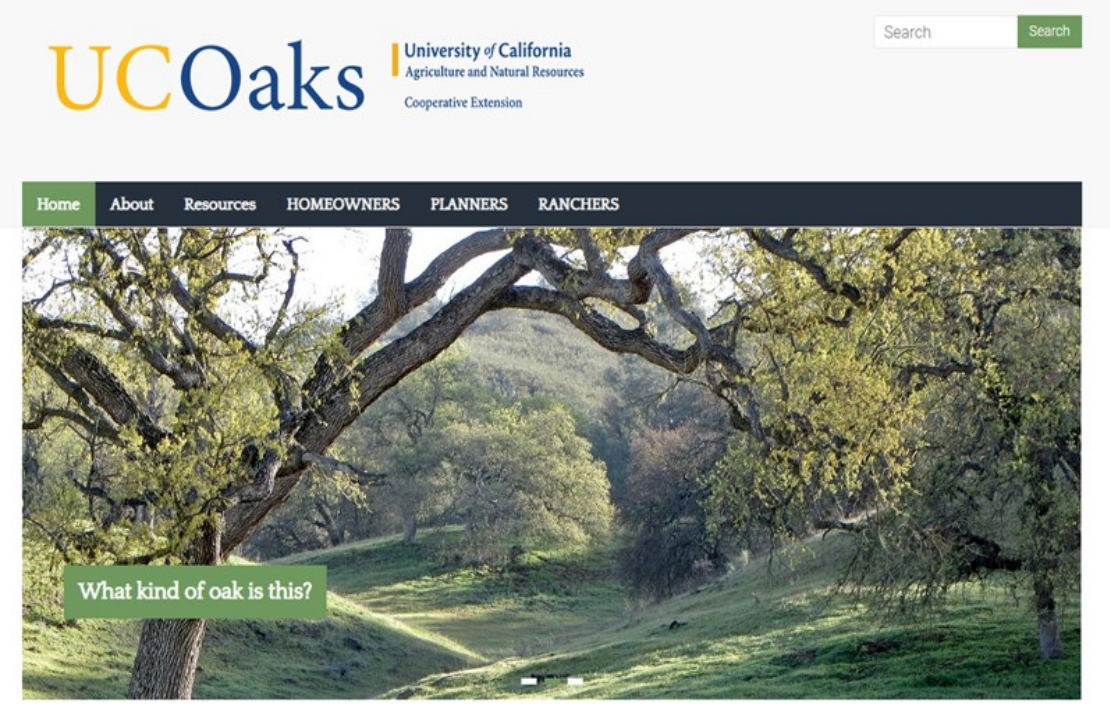
and extending from Monterrey south to Santa Barbara, is home to wildly popular and lesser known destinations. Well known areas include the Big Sur Coast, the estuaries at Elkhorn Slough and Morro Bay, and Monterrey Bay Aquarium. Some of the hidden gems are Pinnacles National Park, Santa Barbara Botanic Garden, and the Gardens of the La Purisima Mission. Together, the authors describe the origins and present composition of the region's environments: "Across the region's 15,000 square miles, physical, and biological processes, combined with time and human actions, have resulted in a broad range of ecosystems, each harboring distinct assemblages of plants and animals." The publication uses engaging vignettes to highlight local conservationists, regional wildlife, historical and contemporary restoration efforts, and interesting places to explore. It begins with a brief history of the region, providing context to descriptions of subsequent environmental and land-use changes, a reminder to readers that while the future of the central coast is uncertain, it will be shaped by our actions. You can find the publication at: http://calnat.ucanr.edu/Resources/calnat_pubs/

Sharing Oak Woodland Research through a Popular Website

Devii Rao,[1] Bill Tietje,[1] Luke Macaulay,[1] Judi Young[2]*
[1]UCANR, [2]Young Digital

Since its creation in 1995, the University of California Oak Woodland Management website has been a valuable educational resource. Based on Google Analytics data from 2011 to 2017, the website receives an average of 45,000 users annually. It is a repository of nearly 30 years of research and outreach data on the ecology, management, and conservation of California's 8 million acres of oak woodlands.

Recent staff retirements and changes in website standards created a need for an update and redesign. To accomplish this, the University of California Cooperative Extension received a Renewable Resources Extension Act Capacity Grant that allowed us to reformat the website for mobile devices; make the website more functional and visually appealing; add some of the latest research; and promote the website to groups who have not historically used it, in particular, the ranching community.



To increase user friendliness, we developed links at the top of the home page for the three primary target audiences: homeowners, land-use planners, and ranchers. On the home page, we also highlighted five topics that receive the most hits: species identification and ecology; oak regeneration and restoration; economic and ecological values of woodland stands; threats to oak woodlands; and woodland wildlife.

The new website, now called **UC Oaks**, went live in June of 2019. The new flexible website design will allow us to continuously meet the needs of our clientele. With its new look and expanded reach, we hope that the website will be a one-stop-shop for everything people need to know about oak woodland conservation and management. https://oaks.cnr.berkeley.edu/

Recent Increases in Blue Oak Mortality

Written by Ted Swiecki and Elizabeth Bernhardt, Phytosphere Research, Vacaville CA—phytosphere@phytosphere.com April 2020

Elevated levels of blue oak mortality have been reported in various parts of California over the past few years. Reported oak mortality tends to occur in a scattered or patchy pattern across the landscape. In some places, other species, such as valley oak have been affected. Concerned landowners have wondered whether another introduced pest or pathogen could be the source of this elevated mortality. In coastal California counties from Monterey County north, sudden oak death, caused by the introduced water mold *Phytophthora ramorum,* has killed many thousands of coast live oak, canyon live oak, California black oak, Shreve oak, and tanoak trees. More recently, several other new invasive species have also been found attacking California oaks. These include gold spotted oak borer, two invasive shothole borers that have become established in parts of Southern California, and more recently, an exotic ambrosia beetle (*Xyleborus monographus*) that was initially found near Calistoga in Napa County.

Fortunately, evidence to date does not suggest that the various scattered areas of blue oak mortality are due to a specific invasive pest. Rather, much of this mortality is related to the severe drought that California experienced from 2012 through 2016. This drought was the most severe since weather data has been recorded in California, and well beyond that, based on tree ring studies.

Drought-related effects

Drought-related oak mortality mostly began to surface after several years of drought and was more likely to appear first in areas with chronically low rainfall and high evaporative demand. California's warming climate has led to longer, hotter dry periods that can severely stress even drought-adapted species like blue oak. A recent study of blue oak woodlands in the lower elevations of Sequoia National Park used recent and older data to document that standing blue oak mortality rates increased dramatically during the 2012-2016 drought, from around 5% in pre-drought data sets to 23% by 2017 (Das et al 2019. Tree mortality in blue oak woodland during extreme drought in Sequoia National Park, California. Madroño 66(4): 164–175).

Although severe drought alone may be able to kill oaks, quite often tree mortality involves other pests and pathogens that target trees under stress. These include an assortment of opportunistic wood boring beetles and decay fungi, especially certain sapwood decay fungi. For example, in some areas widespread valley oak mortality has occurred where groundwater levels have dropped rapidly, such as in areas where a relatively shallow water table has been lowered due to rerouting of watercourses or dewatering related to sand mining. Excessive use of shallow groundwater during drought can impose the same type of induced drought stress. If the drop in the water table happens quickly enough, mature valley oaks may not adapt fast enough and may become severely drought stressed. As these trees become severely stressed, commonly over several years, opportunistic pests and pathogens degrade the sapwood, hastening tree death. If lowering of the water table is slower or reversed after a short time, trees may be able to adapt by deeper root growth or may recover to some degree if stress has not been too severe.

In contrast to valley oak, which mainly occurs where soils are deep and groundwater is typically available through most or all of the dry season, blue oaks are adapted to much drier sites. Based on a study completed in 1993 (Swiecki and Bernhardt 1993. Factors affecting blue oak sapling recruitment and regeneration, http://phytosphere.com/publications/Blueoakregeneration.htm), we concluded that blue oaks tend to occur in the best areas of the worst sites or in the worst areas of the best sites. Blue oaks can do quite well in good soil in moist sites, but under these conditions, they tend to be out-competed by faster-growing trees (e.g., valley oak, coast live oak, California bay). In our yard, comparing trees grown from acorns planted several decades ago (on clay loam soils with a shallow water table), the valley oaks are many times the size of the blue oaks. Due to competition from faster growing, taller trees, in sites with good growing conditions, blue oak is most competitive in poorer areas where the soil water supply is more limited.

Because blue oaks can tolerate much drier conditions than most other native trees in its range, they become dominant in areas with low rainfall and poorer soils, where they are often mixed with the drought-tolerant foothill pine. Although blue oaks are adapted to tolerate drought conditions, they are not desert plants. During severe drought, conditions at normally dry sites can become extreme, and dip below the threshold of blue oak site tolerance. These are the types of sites where much of the recent blue oak mortality has been observed. These intrinsically dry sites (low precipitation, shallow/rocky soils with low water-holding capacity, on hot south-facing slopes) have had the worst of it during the drought. Between 2012 and 2016, California experienced the worst drought in 500+ (some say, 1,200) years. Under these extreme conditions, the “best areas of the worst sites” were no longer all that good, and in some cases resulted in water stress that overtaxed blue oaks’ prodigious drought tolerance.

Due to long-term consequences of stresses and associated pest/disease interactions, elevated levels of oak mortality can continue for many years after the end of the drought. A drought-stressed tree may die during the drought, one- or two-years post-drought, or even several to many years later. The adage that oaks live for a hundred years and die for a hundred years is based on the idea that few things can kill an oak quickly, but an accumulation of insults over time can eventually do it in. Processes that are set in motion during the drought can play out over several to many years.

Historically, most oak mortality in California blue oak woodlands has been caused by various decay fungi, including canker rots and some root-rotting decay fungi. The effects of these agents can be accelerated by severe stress, such as that imposed by severe drought. The destruction of heartwood and sapwood caused by decay fungi is not reversible when conditions improve. Because the pathogens can respond to the moister conditions quicker than the trees, severe drought followed by heavy precipitation can accelerate decline due to agents such as root rots.

Soil types, hydrology, and rainfall amounts vary widely throughout the state and can vary over a short distance within a single watershed. On a given soil type, trees on south-facing slopes will experience more water stress than those on north-facing slopes due to differences in solar radiation. When assessing whether excess mortality may be associated with drought, consider where it occurs across the landscape. Is it more prominent on south-facing slopes or in areas of thin soils? Does the timing of mortality correspond with the drought and expected post-drought effects?

Pests and pathogens

It is important to note that drought is not the only factor that is responsible for mortality of blue oak or other oaks. Unusual mortality could be related to native or introduced pests and pathogens and may not be due to a single cause. For example, even within areas generally affected by sudden oak death, many oaks and tanoaks are killed by other agents.

With the combination of climate change and introduced pests and diseases, we can expect more deviations from what was considered normal, including changes in the ranges of both native and exotic agents that attack oaks. Most new invasive pests and pathogens are introduced by human activities. For most wood boring beetles, movement of infested firewood and other raw wood is a major means of introduction. For root-rotting *Phytophthora* species and some insects, movement of nursery stock is a primary means of introduction, including past plantings of stock used for restoration. Soil movement, including movement from contaminated areas to other areas on vehicles, equipment, livestock, and shoes, can also be a route for spread of *Phytophthora* and other soilborne agents. Consequently, new introductions of exotic pests and pathogens are more likely to occur first near homesites and other developed areas, along roads, maintained utility corridors, and near heavily used points of entry into a property rather than in remote areas with little or no human activity.

Some introduced pests and pathogens produce unusual symptoms, such as the extensive bleeding associated with the gold spotted oak borer and invasive shothole borers. However, some introduced pests and pathogens cause symptoms that resemble drought effects. In Santa Clara County and elsewhere, we have documented sites where native blue oak and other oak stands showed tree decline and death associated with introduced root-rotting *Phytophthora* species. Because these pathogens destroy fine feeder roots, they can induce water stress in the presence of adequate soil moisture. Phytophthora root rots can also exacerbate the effects of drought because they reduce the total root volume that trees use to absorb soil moisture.

Diagnosing the causes of tree mortality is not a simple process and may require the involvement of specialists. Forest health and resource specialists from UC Cooperative Extension and CalFire can help landowners assess oak tree mortality to determine possible causes. However, determining the cause of oak mortality can be a daunting task even for experts, and may be impossible if trees have been dead for a long time. Because tree decline and death often involves several interacting factors, it is very helpful if the landowner can provide detailed information about site history and the onset of symptoms. Good digital photos, showing both relevant close-ups and wide-angle views of the affected locations can provide a way to easily record and store your observations and share them with specialists.

For more information see the journal article “TREE MORTALITY IN BLUE OAK WOODLAND DURING EXTREME DROUGHT IN SEQUOIA NATIONAL PARK, CALIFORNIA” in MADRONO, Vol. 66, No. 4, pp. 164–175, 2019.

Weather Outlook – Spring 2020

Royce Larsen, Watershed/Natural Resource Advisor

As we have watched forage growth struggling this year, some may have looked back at the dry years we have recently endured and wondered if this year will be a drought? Paso Robles has kept rainfall records since 1887, with an average annual rainfall of 15.1 inches. Normally, most of the rainfall comes between December and March, with January and February being the wettest months. But as you know, averages don't tell the whole story. This year Paso Robles had a very wet December, about 2 times the average, Figure 1. But since then it has been very dry, there was 0.66" in January, and 0.0" in February. In Paso Robles there have been three years with no recorded rainfall for January, and 5 years for February. However, looking at January and February combined, there has only been one year, 1983-1984 (0.44"), where there was less rainfall than this year (0.66").

Many refer to the miracle March of 1991 (Fig. 1) as a very important year that saved the livestock industry. That was an incredible year, with more than 10 of the 14.3 inches of rain coming in March. But 2017-2018 was somewhat similar, with over 7 of the 10.8 inches coming in March (Fig. 1). This year, we have had 3 ½ of the 10.6 inches coming in March (Fig 1). The Forecast suggests we may still get more rainfall in April.

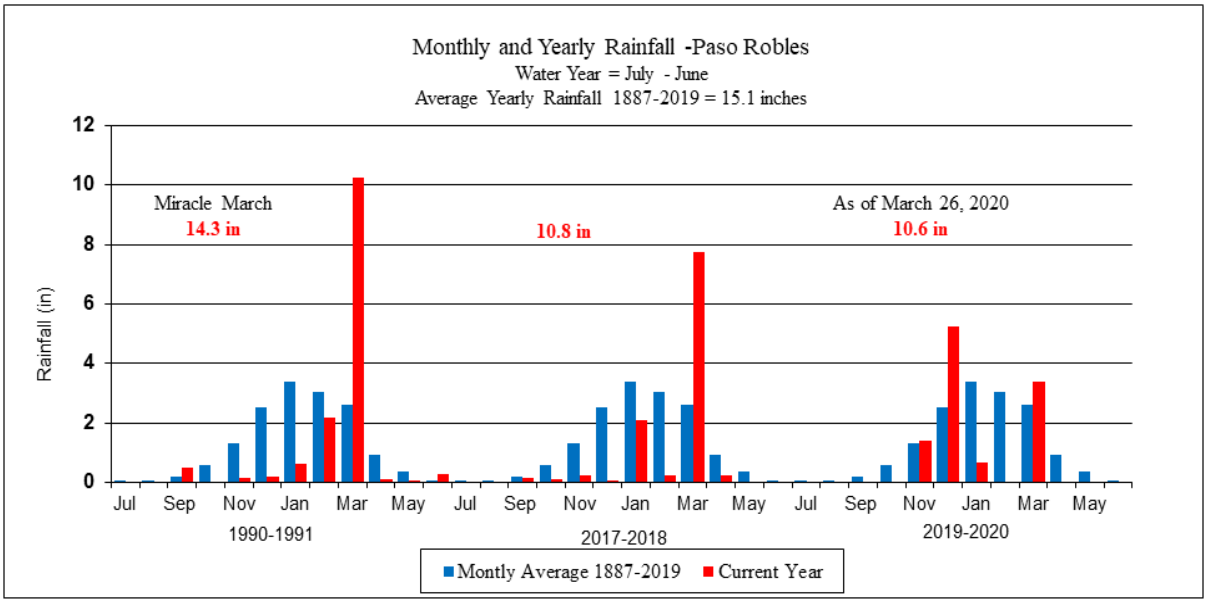


Figure 1. Comparison of monthly and Yearly rainfall for Paso Robles, 1990-1991, 2017-2018 and 2019-2020. *Data from City of Paso Robles: https://www.prcity.com/462/Rainfall-Totals*

Not only is it important to consider how much rain comes each year, but also when it comes. In addition to every year having a different total, each month is also different. March is a critical month for forage growth. December through February is usually too cold for much growth, but as temperature begins warming in March, the rapid growth phase begins. If moisture is available, you can almost see daily growth spurts later in March and into April. There is "very little growth" when temperatures are less than 50° F, but the rapid growth phase begins when the temperature reaches about 70° F.

Hence, rainfall in March can be very effective at increasing forage production. Annual plants evolved with seed production being a priority. If there is plenty of moisture, the plants will first put their energy into "growing foliage", e.g., producing more feed for livestock. But, if moisture is lacking, the plants tend to focus on "seed production", with little foliage growth.

A look back at the last 9 years, Figure 2 shows just how much the yearly and monthly rainfall can change. The drought we experienced during 2012-2016 may have been the worst during the last 500 years. There was a combination of lower rainfall and warmer temperatures which not only lead to low forage production, but also put a lot of stress on vegetation causing high mortality in our oak trees and shrubs (see information on oak mortality in this newsletter). To see more about forage production on the Central Coast please take a look at the forage production reports: http://cesanluisobispo.ucanr.edu/Custom_Program355/Forage_Production_Report/.

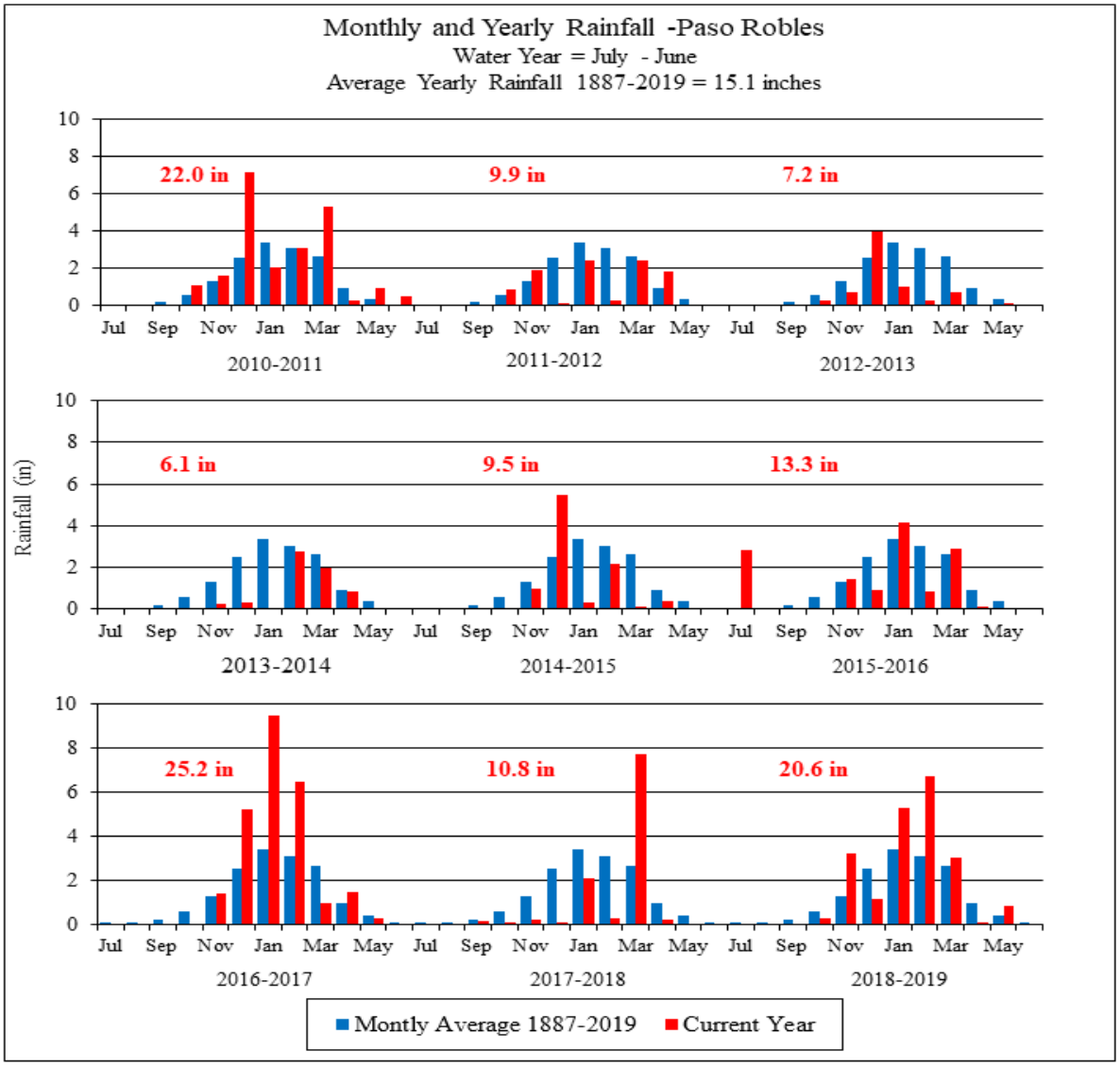


Figure 2. Comparison of 9 years of monthly and yearly rainfall, 2010 – 2019, at Paso Robles. *Data from City of Paso Robles: https://www.prcity.com/462/Rainfall-Totals*

The cow size of the future

By Matthew Shapero, Livestock and Range Advisor, Santa Barbara and Ventura Counties

This past January and February were bleak. While we had a strong start to the rain year (in Los Alamos, for example, rainfall for November and December was 158% of normal), our historically two wettest months (Jan & Feb) were the second driest in the 110 years since records have been taken. It was hard not to begin to fear the worst—and there was drought on the mind. In mid-February, after six nearly rainless weeks, I was at a talk in Denver at the annual meeting for the Society for Range Management. The subject was how cow-calf producers could and would need to adjust their operations in the future, to respond to seasonal weather patterns becoming increasingly more extreme and variable. There was talk of re-thinking range cow size, and reference was made to research out of Wyoming that examined how cows of different size classes performed during different rain years.

While March brought some good storms here locally and washed away for most the threat of catastrophic drought, the Wyoming paper still holds some valuable lessons for the future that I think are worth summarizing here.

The authors of the 2015 study begin by acknowledging that while it has always been generally recognized as important to select cows that match their production environment, that the trend in genetic selection for maximum calf growth has led to gradual increases in the size of beef mother cows. An unrelated but simultaneous trend in recent decades, they explain, has been an increase in temperature, drought severity, and drought frequency. Their study, then, had three objectives: 1) to quantify the effect of drought on weaning weight regardless of cow size (i.e. are calves at weaning smaller during drought); 2) to compare how cow size influenced weaning weights of calves relative to drought (i.e. what size cow produces the heavist calf in years with different forage conditions); and 3) to determine how efficiency was influenced by cow size and drought (i.e. which cows produce the heaviest calf relative to her body weight and consume the least when forage conditions are limited).

The project ran from 2011 to 2014 at two rangeland sites that belong to the University of Wyoming Agricultural Experiment Station Beef Unit near Laramie. Both sites are high elevation and precipitation averages 13.5 inches. During the four years of the study, 2012 was the driest on record (7.91 inches) and 2014 was the fourth wettest (16.73 inches), so the research spanned a large variation in rainfall.

The study tracked 80 Angus-cross spring-calving cows, all of whom had been in the herd for at least four years. The cows were stratified into 5 100-lb weight classes: 1000 lbs (9 cows), 1100 lbs (22 cows), 1200 lbs (29 cows), 1300 lbs (10 cows), and 1400 lbs (10 cows). Cows were artificially inseminated in order to control for sire-influenced growth genetics. And because birth dates, birth weights, and weaning dates varied, all calf results were adjusted to a standardized 210-day Weaning Weight (WW) for comparison.

So what were the results?

- **Weaning weights.** Regardless of cow size, the driest year of the study (2012) produced the lightest calf WW. The wettest year (2014) produced the heaviest calf WW.
- **Influence of cow size.** Cow size did influence calf WW, but the influence depended on precipitation: in the driest year (2012), as cow size increased, WW increased; oppositely, in the wettest year (2014), the smallest cows weaned the heaviest calves. Smaller cows had the greatest variation in calf size as rainfall varied, see Figure 1.
- **Efficiency.** Cow efficiency was measured as the total product (calf WW) per female relative to the dam's body size, essentially measured as the percent of the cow's body weight weaned. Regardless of the study year or the precipitation amount, the two smallest cow sizes always had significantly higher efficiency ratios than the two largest cow sizes.
- **Forage consumption.** Given increased nutritional requirements as cows increase in size, over the course of a 210-d birth-to-weaning period, the largest cows required an additional 1,064 lbs of forage compared to the smallest cows. Accordingly, large cows required 25% more forage than small cows for every for every pound of calf weaned.
- **Herd size.** Because a ranch can run a greater number of small cows than they can large cows, in both drought and wet years smaller cows raise significantly more pounds of calf per ranch or per unit area.

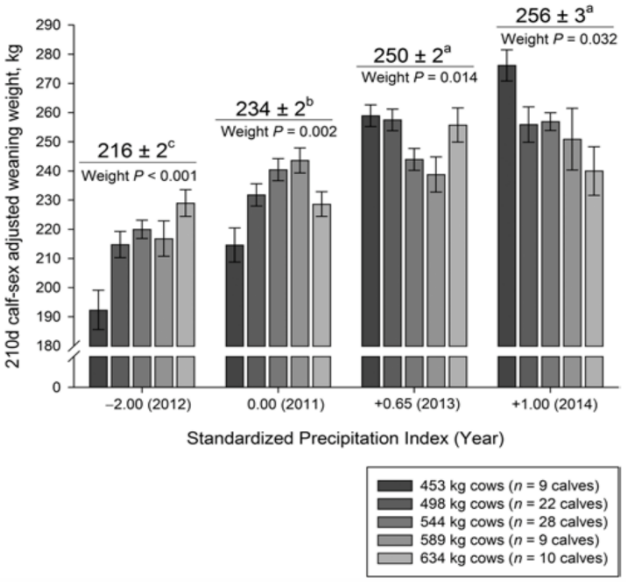


Figure 1. Effect of drought and cow size from research publication. All results expressed in kilograms (multiply by 2.2 for US lbs). Different years are along x (horizontal) axis. Calf WW are along y (vertical) axis. Small cows showed the greatest variation in their calf WW between dry and wet years. Their efficiency and productivity on a per acre basis, however, was greater than other classes of cow size.

So, what are the takeaways from this study then? Results indicate that small- to moderately-sized cows performed better on a per acre basis in all years of the study—across both drought and wet years. Yes, large cows produced heavier calves during the drought year of 2012 (the authors speculated this had something to do with potential advantages of balancing optimal rumen capacity and dry matter intake), but their efficiency was lower than that of small calves. In short, whatever advantages larger cows provide in drought years weaning heavier calves, is outweighed by the fact that smaller cows raise more calves per acre on less forage. This study demonstrates a real, measured economic benefit in all years—wet or dry—to run smaller rather than larger cows. In conclusion, the authors warn again against the inclination to focus too much on selecting sires that increase the weaning weight of calves in a herd. Likely, this effort will introduce sire genetics that ultimately—albeit maybe inadvertently—increase a herd's cow size.

Of course, the climatic and production variables in Wyoming are quite different than ours are in California, but the work to me indicates a promising direction for cow-calf producers to move that would both have immediate economic benefits and longer-term advantages responding to a more variable climate. If you move in this direction, however, be sure to revisit your stocking rate calculations regularly, as decreasing cow size will only be an advantage if you concurrently increase your total number of cows.

If you wish to read the original research article, please contact me directly for a copy.
Scasta, J. D., Henderson, L., & Smith, T. (2015). Drought effect on weaning weight and efficiency relative to cow size in semiarid rangeland. Journal of animal science, 93(12), 5829-5839.

Another Invitation to Join Email List

Many of you responded to the call for emails when I sent my last newsletter out, for that I thank you. For those who are still receiving the hard copy of the newsletter, I am asking again if you would prefer to have your newsletters delivered by email. Due to budget restraints I regularly send out notices through email, but only occasionally (usually one time per year) in printed format. These newsletters/announcements cover news about workshops, or other events. You can visit my website at (http://cesanluisobispo.ucanr.edu/) (look for the Watershed, Natural Resources and Range Management Tab) at any time without being added to any mailing list and find current information listed there http://cesanluisobispo.ucanr.edu/Custom_Program355/Newsletter_810/

Email is the fastest way to receive timely and frequent notifications for any new updates. Some workshops and event announcements may only be sent via email. If you would like these notifications, and are not already receiving them, please contact me at relarsen@ucanr.edu. I can also be reached at 805-434-4106. If you already get email notices from me, please disregard this letter. Thank you for your interest. My hope is to provide information that will be helpful to each of you in your endeavor to manage your rangelands.

Thank you,

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http://cesanluisobispo.ucanr.edu/

Coronavirus Information

We are facing a crisis like most of us have never seen before. The state of California has issued an order to shelter-in-place. All UCCE employees have been directed to work remotely. However, we are still available by phone and email. UCANR, and the San Luis Obispo office, lead by Dr. Katherine Soule, has put together a lot information about the coronavirus, and there are regular updates from UCANR. This information can be found at: http://cesanluisobispo.ucanr.edu/