

Sacramento Valley Field Crops Newsletter, Summer 2014



University of California

Agriculture and Natural Resources | Cooperative Extension | Sutter-Yuba Counties

Drought impacts on agriculture and groundwater

A report released in July from the UC Davis Center for Watershed Sciences summarized the impacts of the 2014 drought:

“The 2014 drought will result in a 6.6 million acre-foot reduction in surface water available to agriculture. This loss of surface water will be partially replaced by increasing groundwater pumping by 5.1 million acre-feet. The resulting net water shortage of 1.5 million acre-feet will cause losses of \$810 million in crop revenue and \$203 million in dairy and other livestock value, plus additional groundwater pumping costs of \$454 million. These direct costs to agriculture total \$1.5 billion. The total statewide economic cost of the 2014 drought is \$2.2 billion, with a total loss of 17,100 seasonal and part-time jobs.”

A summary of the report is available here:

http://www.news.ucdavis.edu/search/news_detail.lasso?id=10978

and the full report can be found here:

https://watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf

‘A slow-moving train wreck’

This is the description of the groundwater situation from Professor Richard Howitt, the study’s lead author. It is estimated that two-thirds of the state’s water supply will be pumped from wells in 2014, as in previous dry years. I know that people are seeing well water levels drop in the Sacramento Valley.

This ‘overdraft’ (pumping more out of the aquifer than is being recharged) is clearly not sustainable on a year-in, year-out basis. Even though groundwater and the regulations that may eventually accompany its use make for thorny conversation, it is a conversation that is happening, and one that we all need to engage in (as politely as we can).

Most of the farmers I know are forward-looking problem-solvers. For that reason, I want to point your attention to an overview of the groundwater situation, some policy efforts that are currently afoot, and **the role that agriculture might play in groundwater recharge/banking**. These are summarized in a recent California Agriculture article by University of California scientists Thomas Harter and Helen Dahlke. The article is available here:

<http://ucanr.edu/repositoryfiles/cav6803p54-136027.pdf>

and a printed version will accompany mailed versions of this newsletter.

Managing corn in drought conditions

I recently recorded a presentation for the California Water and Drought Seminar video series:

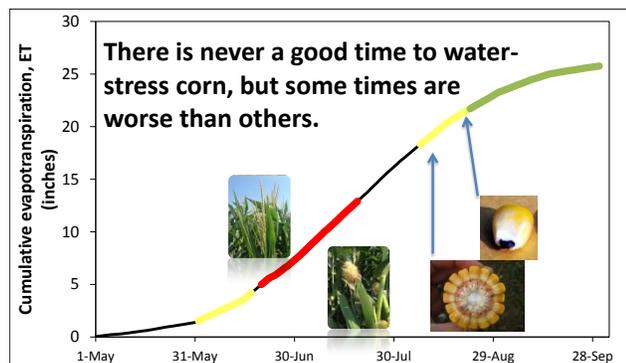
http://ciwr.ucanr.edu/California_Drought_Expertise/Insights_Water_and_Drought_Online_Seminar_Series/

on managing corn under California’s drought conditions. The video recording is not yet available, but the slides from the

presentation as well as the text are available here:

<http://cecolusa.ucanr.edu/files/195616.pdf>

A brief summary:



- 1) The worst time is during the weeks leading up to and following tassling and silking, when pollination is occurring.
- 2) If you must stress the crop, the mid-vegetative and late stages of grain filling are the times that will probably have the least yield consequence.
- 3) Be sure to quit irrigating after the crop has reached maturity.

Supplemental Coverage Option (SCO) deadline for winter wheat is September 30th

The first enrollment deadline for SCO is September 30th for winter wheat. Colusa, Sutter and Yolo counties are all eligible, as are several counties in the San Joaquin Valley:

<http://www.rma.usda.gov/news/currentissues/farmbill/SCOWheatfilingdates.pdf>

A factsheet on the new SCO program is available from the USDA here:

<http://www.rma.usda.gov/news/currentissues/farmbill/2014NationalSupplementalCoverageOption.pdf>

This includes information on how SOC relates to ARC coverage. Another useful summary of SOC and how it relates to ARC, with some practical examples, is provided by Oklahoma State University at this link:

<http://osuwheat.com/2014/08/11/agriculture-policy-news-supplemental-coverage-option-sco-for-winter-wheat/>

Meeting announcement

There will be a meeting/listening session to discuss the possibility of developing crop insurance for alfalfa and other forage crops. It is being hosted by Agralytica, under contract with the USDA's Risk Management Agency (RMA). The objective of the listening session is to receive input from producers to assist with the development of either a new or improved crop insurance policy to better meet the risk management needs of forage producers. The meeting will be **Tuesday, September 9th from 7:30-10AM at UCCE's Norton Hall, 70 Cottonwood Street, Woodland, CA 95695.** A full meeting announcement is attached at the end of this newsletter.

A digital copy of this newsletter is available:

<http://cecolusa.ucanr.edu/Field Crops/Newsletter 805/>

Don't hesitate to contact me with questions, concerns or ideas:

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The development of crop insurance for alfalfa and other forage crops

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Listening sessions for alfalfa and alfalfa/grass mix producers and crop insurance company staff

USDA's Risk Management Agency (RMA) has contracted with Agralytica of Alexandria, Virginia to collect background information to assist with the development of crop insurance that better meets the needs of alfalfa and other forage producers.

With the support of the California Alfalfa & Forage Association, Agralytica staff will be holding a listening session with alfalfa growers, crop insurance staff, and other interested parties to obtain input on the crop insurance needs of the sector.

The objective of the listening session is to receive input from producers to assist with the development of either a new or improved crop insurance policy to better meet the risk management needs of forage producers. Our initial focus is on alfalfa and alfalfa/grass mixtures. We will review all types of risks faced by the producers and potential yield/quality or revenue based types of insurance. **We need producer and crop insurance staff input to clarify the main issues to focus on in designing this product.**

The date, time, and venue for the listening session is as follows.

Date & time: Tuesday, September 9 07:30 breakfast 8:00 - 10:00 a.m. listening session
Venue: Norton Hall, The University of California Cooperative Extension Center, 70 Cottonwood Street, Woodland, CA 95695
Telephone: (530) 666-8734 (UC Cooperative Extension office)

Agralytica staff will also be available for individual meetings at all the above locations. To arrange a time, contact **Nick Young** at (703)-981-6002 or at nyoung@agralytica.com. Alternatively, anyone can submit phone or e-mailed comments to **Nick Young** or to **Tom Earley** at (703)-981-6004 / tearley@agralytica.com

Out of sight but not out of mind: California refocuses on groundwater

Thomas Harter, UC Cooperative Extension Specialist, Department of Land, Air and Water Resources, UC Davis

Helen E. Dahlke, Assistant Professor, Department of Land, Air and Water Resources, UC Davis

A deepening 3-year drought, accentuated by a record dry 2013, has focused public attention on groundwater like never before. And for a good reason: Almost everywhere in California, groundwater levels have been drawn to record depth and domestic and farm wells are drying up at an unprecedented pace. Well drillers are booked for months in advance to deepen existing wells or to construct new, much deeper ones. Even in a wet year, groundwater makes up one-third of our urban and agricultural water supply, but in 2014, as in previous dry years, nearly two-thirds of the state’s water supply will be pumped from wells that are tapping into California aquifers. The economic consequences of not having this hidden resource available in future droughts would be catastrophic.

A significant number of regions in California won’t have groundwater available in another generation or two if we continue business as usual.

Yet, a significant number of regions in the state will not have this resource available in another generation or two if we continue business as usual. As groundwater depletes, damage will increase to our water, transportation and urban infrastructure due to land subsidence; critical ecosystems in groundwater-dependent streams will be lost; and costs will incur from pumping irrigation water from deepening water levels and preventing seawater intrusion into our coastal aquifer systems.

The state has seen similar crises before, particularly in Southern California, where groundwater basins are smaller, have more limited supplies, and had been overtapped soon after powerful turbine pumps were invented in the early 20th century. Extended, expensive court battles between thirsty urban neighbors have divided up the basins and resulted in adjudications that allocate specific amounts of water to specific groundwater users. The adjudications are administered through a local water master and have halted, if not reversed, the overdraft of these basins. A wide range of measures and complex arrangements between multiple stakeholders and the public have generated significant water conservation, development of alternative surface water supplies, and increased groundwater recharge and groundwater banking opportunities.

In other regions of California, particularly in the Central Valley, groundwater overdraft continues, exacerbated by below-average, or well-below-average, precipitation in 6 of the past 8 years. In some areas, including Paso Robles and the eastern San Joaquin Valley, overdraft is a recent phenomenon caused by agriculture expanding into former rangelands and growers using either stream-fed flood and furrow irrigation or high-efficiency irrigation systems that rely on groundwater that lacks recharge from streams.

Past droughts have provoked calls for groundwater action: In 1992, the California Legislature passed AB 3030, which encouraged local agencies to collaborate and develop groundwater management plans, though few guidelines were provided. Following another drought, the Legislature passed SB 1938 in 2002, which required those local agencies receiving state funding for water projects to have a groundwater management plan in place. This time, the state provided guidelines on minimum standards that the plans needed to fulfill to receive a passing grade from the state’s Department of Water Resources (DWR). Following the 2007–2009 drought, the Legislature asked DWR to develop more rigorous groundwater level monitoring throughout the state, with the support of local agencies or initiatives.

Significant improvements in groundwater management occurred in some areas. Local agencies began thinking and talking about managing their groundwater; education and outreach activities have been offered to stakeholders through various organizations, including UC Cooperative Extension; and local advisory groups have engaged the public and the many local and regional agencies dealing with or affecting groundwater.



Kings County well pumping into an irrigation system.



However, because none of this has stopped groundwater overdraft where it occurs, the demand for more comprehensive groundwater management has grown significantly over the past year. Last fall, the State Water Board (SWB) introduced a discussion draft of a groundwater work plan, and, in February, Governor Brown issued the Water Action Plan, which calls for significant legislative action on groundwater management. In response, the Association of California Water Agencies and a broad group involved in the stakeholder-driven process facilitated by the California Water Foundation issued these proposals, which indicate broad consensus on critical elements of groundwater management:

- Groundwater is most effectively managed at the local or regional basin level, with support from the state.
- Local groundwater management entities must be given better tools, such as clear mandates to assess, measure, monitor and allocate their groundwater and control its extraction.
- The definition of groundwater sustainability can be set at the state level and translated into specific actionable thresholds that must be enforced locally, with a credible threat of state enforcement should the local efforts be unsuccessful.
- Much better data collection, analysis, reporting and data integration are needed to provide transparency, to support local management efforts and to properly inform the public. This requires much stronger planning and support within the DWR and SWB.

But more needs to be done. Local land-use decisions on urban and agricultural development, which have critical impacts on groundwater resources, must be consistent with groundwater management objectives. This will require significant communication between land-use and groundwater managers. Effective integration with water quality management and surface water management efforts, which are governed separately, is also required. And none of these efforts can occur without sustained funding through a mix of local and state sources.

Can agricultural fields aid in water security?

Of particular interest to UC is the emphasis on the need for new tools to better manage groundwater. In 2014, a team of UC Davis faculty and Cooperative Extension specialists and advisors began exploring the feasibility of using agricultural land for transferring excess surface water during the winter rainy season into groundwater aquifers. The project is called Groundwater Banking: An Agricultural Systems Approach for Water Security. The idea is that during storms (or flood control releases) excess surface water could be directed from streams via existing water conveyance systems onto dormant agricultural fields, which would then serve as infiltration basins. If successful, several hundred or thousand acre-feet of water could be recharged annually into California's aquifers during very short periods. The banked groundwater could then be used to satisfy agricultural and urban water demand during dry years, leaving the available surface water for critical environmental uses such as enhanced streamflow.

This 3-year project, funded by UC Division of Agriculture and Natural Resources, aims to set up pilot groundwater recharge

field experiments, which would provide valuable data to address concerns about the costs and risks to crops, the influence these projects may have on groundwater levels and flows, and the possibility of recharging contaminated water or degrading groundwater quality by leaching contaminants such as nitrate from the vadose zone. Potential collaborators for the field experiments include the Glenn County Water Advisory Committee and the Bureau of Reclamation.

Besides the field experiments, the project is also developing suitability indices, such as the Soil Agricultural Groundwater Banking Index (SAGBI), to identify optimal recharge sites on agricultural land. Developed by Toby O'Geen, UC Cooperative Extension soil resources specialist, and the UC Davis Soil Resource Laboratory, the SAGBI ranks soils most suitable for groundwater recharge based on their ability to accommodate deep percolation, maintain a freely drained root zone, distribute water evenly on the landscape, minimize groundwater contamination by salts, and resist erosion and soil crust formation. This index will be combined with information on each possible site's climate, geology, irrigation infrastructure, soil water quality and surface and subsurface hydrology. If repeatedly used for groundwater recharge, a site would need to be protected from high application rates of fertilizer and pesticides; hence, the research team is investigating land with cropping systems that demand low nutrient and pesticide input, such as alfalfa fields and irrigated pasture. Recharge on fields with low-nutrient input cropping systems could sustain or even improve groundwater quality in areas where buildup of nutrients, pesticides, pollutants and salt in the soil is otherwise a concern.

A further aspect of the project is to develop knowledge of the socioeconomic effect of groundwater recharge on agricultural production, farm revenues and crop yields, all of which are fundamental factors in whether the groundwater banking program might be adopted across California. Data collected could serve as a foundation for developing economic incentives at the local, state or federal level to acknowledge the landowner's service to the local community and California's water supply reliability.

The 2013 update of the California Water Plan states that "one of the roles and goals of California is to seek statewide water supply reliability and sustainability [and] to strive for sustainable groundwater supplies throughout the state." Enhancing groundwater storage through intentional agricultural groundwater banking could potentially provide a means to attain these goals. Groundwater is California's largest source of water during droughts, and UC's research on its management, recharge and conjunctive use aims to ensure that a reliable supply is secured for farms and cities throughout the state.