Imperial County *Agricultural Briefs*

University *of* California
Agriculture and Natural Resources
UC Cooperative Extension

Features from your Advisors

September 2018 (Volume 21 Issue 8)

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WHAT WE NEED TO KNOW ABOUT STATE WATER EFFICIENCY AND ENHANCEMENT PROGRAM (SWEEP) FUND 2018

Ali Montazar, Irrigation and Water Management Advisor, UCCE Imperial and Riverside Counties

The State Water Efficiency and Enhancement Program (SWEEP) is a program that provides financial assistance in the form of grants to implement irrigation systems that reduce greenhouse gases (GHG) and save water on California agricultural operations. California Department of Food and Agriculture (CDFA) announced that 2018 SWEEP will disperse up to approximately $9.5 million to California agricultural operations investing in irrigation systems that reduce GHG emissions and save water. Here's what we need to know about 2018 SWEEP:

- What types of projects are eligible for SWEEP funding? Applicants may consider incorporating several projects types to achieve both water conservation and GHG emission reductions, such as soil moisture monitoring to ensure efficient irrigation scheduling, micro-irrigation or drip systems, switching to low pressure irrigation systems, pump retrofits, variable frequency drives, and installation of renewable energy to reduce on-farm water use and energy.

- How much can be funded and for how long for 2018 SWEEP applicants?

- The maximum grant award per project is $100,000
- The maximum grant duration is 18 months.
- Costs incurred before June 1, 2019 will not be reimbursed and a project must be completed and operational no later than December 31, 2020.
- CDFA reserves the right to offer an award different than the amount requested.

- What are the eligibility and exclusion policies of SWEEP?

- The irrigation project must be on a California agricultural operation.
- An agricultural operation entity cannot receive a total cumulative SWEEP funding amount of more than $600,000.
- Applications cannot build upon any previously funded SWEEP projects directly affecting the same Assessor's Parcel Numbers (APNs).
- An applicant must be at least 18 years old.

- Projects must reduce on-farm water use and reduce GHG emissions. Applicants must provide supporting documentation directly related to actual, on-farm water consumption and GHG emissions during the prior growing season to be eligible for funding.
- The fund cannot be combined with the United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Environmental Quality Incentive Program financial assistance, meaning that applicants may not accept funding from both entities for the same project and APN.
- SWEEP grant funds cannot be used to: (1) expand existing agricultural operations (i.e., additional new acreage cannot be converted to farmland), (2) install new groundwater wells or increase well depth, (3) test new technology or perform research, pay for engineering costs associated with the project development and planning, (4) lease weather, soil and irrigation water based sensors for irrigation scheduling, (5) purchase tools and equipment with a useful life of less than two years.

What is the timeline of 2018 SWEEP? The CDFA will release the request for grant applications of SWEEP in November 2018. CDFA grant application workshops and webinars will begin immediately after releasing the request for grant applications and will continue for about two months. Grant applications will be due January/February 2019 (8-week application period). Award funding will be announced in Spring 2019.

Further information on 2018 SWEEP fund can be found at: https://www.cdfa.ca.gov/oefi/SWEEP/.

RESPIRATION RATE OF HOLSTEIN STEERS DURING HIGH AMBIENT TEPERATURES

Brooke Latack, Livestock Advisor, UCCE Imperial, Riverside, and San Bernardino Counties

Respiration rate has been used as a method to determine thermal comfort of animals, a reflection of changes in animal core temperatures to adapt to an increased ambient temperature. It is suggested that respiration rates greater than 80-90 breaths/minute indicate some heat stress, while rates greater than 120 breaths/minute indicate severe heat stress. Respiration in cattle increases 3.3% for every degree centigrade (C) increase over 24^0C (Hahn, 1999). While changes in ambient temperature affect respiration rate, temperature and humidity (temperature-humidity index) do not explain the variation among individual animals. Shading in pens can affect the relationship between ambient temperature and cattle respiration rate, resulting in plateaued respiration rate instead of a continuous increase as ambient temperature increases (Brown et al, 2005). Furthermore, a change in core body temperature for shaded cattle is more of a function of eating patterns (Gaughan et al, 2008). Animals will decrease feed intake to adapt to increasing ambient temperature, which ultimately decreases the amount of heat the animal needs to dissipate. This indicates that respiration rate and ambient temperature may not be a straight forward method for assessing animal comfort, as previously thought, suggesting that additional impacts on performance parameters (live weight and growth performance) also need to be investigated. Given the extreme heat experienced in the low desert region, along with the adaptation of the animals to the heat, an understanding of the relationship between cattle respiration rate and productivity can benefit producers. The objective of this study was to evaluate the relationship between cattle respiration rate and ambient temperature, live weight, and prior 28-d ADG.

One hundred eighty-eight (188) calf-fed Holstein steers at the UC Desert Research and Extension Center were monitored for respiration rate and ambient temperature to evaluate the relationship between the two variables and the effect they have on feedlot steer performance. Measurements were collected on July 10-14, 2017 at 8:00, 9:00, 10:00, and 11:00 am. The ambient temperature averaged 32.9 ±0.7, 34.9 ±0.7, 36.6 ±0.5, and 37.8 ±0.5 C for the respective time intervals. The cattle had been on feed for approximately 322 days. Average daily gain was collected for the 28 days prior to respiration data collection. Cattle were fed a steam flaked corn-based finishing diet.

Our findings showed that respiration rate of the cattle increased as ambient temperature increased, though there was great variability between steers (Figure 1).

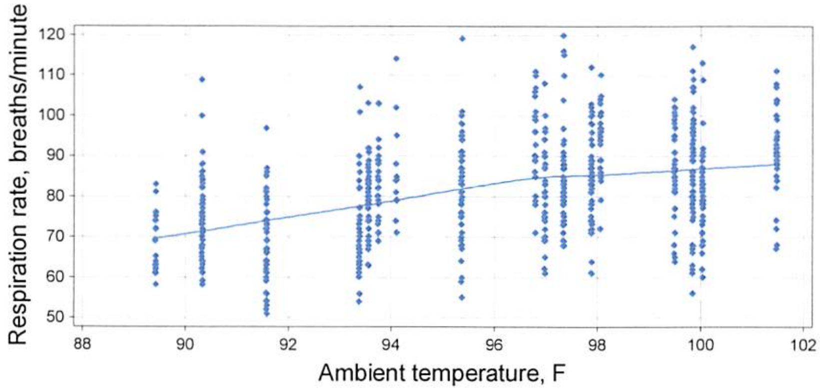

Figure 1:*Interaction between ambient temperature and respiration rate for feedlot steers*

Cattle respiration rates ranged from 60-85 breaths per minute at the lowest ambient temperature and increased to 60-120 breaths per minute as ambient temperature increased. Respiration rate tended to plateau by 10:00 am (Figure 2).

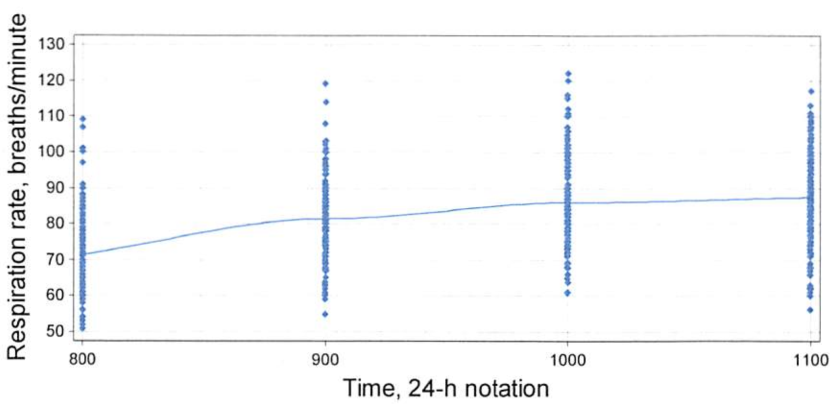

Figure 2*: Respiration rate at hourly data collection intervals*

However, the relationship between respiration rate and live weight gain of steers was flat, suggesting that respiration rate is not a good indicator of cattle performance and was not related to live weight of the steer (Figure 3).

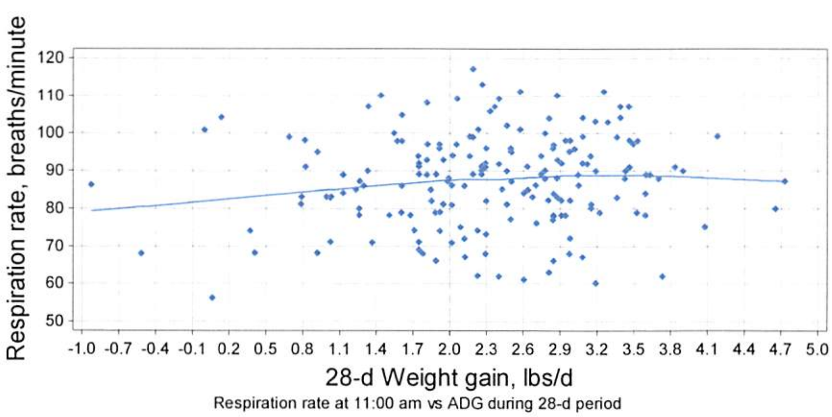

Figure 3*: Interaction between 28-d weight gain and respiration rate for feedlot steers*

It was observed that the prior 28-d weight gain was low (1.07±0.41 kg), which can be explained by a decrease in feed intake as an adaptive technique in high temperatures.

In summary, this study shows that cattle respiration rate is extremely variable and is affected by ambient temperature, but cattle respiration rate alone may not be an accurate indicator of animal comfort and does not represent performance of the steer as the animals in the low desert have utilized short term adaptive abilities to maintain their core temperature. Based on the temperature-humidity index (THI) at the time of data collection, the heat stress category would be considered "Danger" but based on average respiration rate the animals would be in the "Normal" respiration range (<90 breaths/minutes).

For further information, refer to the following reading materials:

- Latack, B.C and R.A. Zinn. Respiration rate of calf-fed Holstein steers exposed to high ambient temperature during the late finishing stage. Poster presented at: 2018 ASAS-CSAS Annual Meeting & Trade Show; 2018 July 8-12; Vancouver, BC, Canada.
- Berry, I.L, M.D.. Shanklin, and H.D. Johnson. 1964. Dairy shelter design based on milk production decline as affected by temperature and humidity. Trans. ASAE. 7: 329-331.
- Brown-Brandl, T. M., R. A. Eigenberg, J. A. Nienaber, and G. L. Hahn. 2005. Dynamic response indicators of heat stress in shaded and non-shaded feedlot cattle, Part 1: Analyses of indicators. *Biosystems Engineering* 90: 451-462.
- Hahn G., J. B. Gaughan, T. L. Mader, and R. A. Eigenberg. 2009. Thermal indices and their applications for livestock environments. In livestock energetics and thermal environmental management (ed. JA DeShazer), pp. 113–130. Amer. Society of Agri. and Biol. Engineers.
- Mader, T. L., M. S. Davis, and T. Brown-Brandl. 2006. Environmental factors influencing heat stress I n feedlot cattle. J. Anim. Sci. 84:712–719.

PLANT GROWTH REGULATORS MAY SUPRESS DURUM WHEAT CROP LODGING

Oli Bachie, Agronomy Advisor, UCCE Imperial, Riverside & San Diego Counties & Director UCCE Imperial County

Durum wheat is one of the major crops in the low desert. Wheat lodging in the Imperial Valley (Figure 1) is a widespread problem and occurs in many growers' fields. Lodging is the bending over of crop stems near the ground level. It is also used to describe regions of crop fields (or sometimes whole fields) that fall flat. Lodging can be caused by a large growth on the lower part of a plant stalk brought about by overgrowth, high nitrogen level, abundant watering, and / or shading. Climbing weeds and crop diseases that affect shoot and root growth can also cause lodging.

Figure 1: lodged wheat field

Wheat fields with dense canopy (often caused by excessive early nitrogen rates or soils with high volumes of residual nitrogen) between stem elongation and heading crop stages may be more prone to lodging than normal crop density fields. Wheat crops most often lodge at the end of milk stage and the beginning of soft dough stage. While some lodged plants may recover and stand back up, crop yield has already been affected. In addition to yield loss, lodging makes harvesting and no-tilling cultural practices very difficult. Furthermore, lodging causes uneven grain maturity and hence undesirable productivity. Therefore, crop lodging is a costly phenomenon.

While wheat crop lodging can be reduced or even eliminated with careful crop management, such management techniques are not always easy to implement. Another alternative approach in preventing wheat lodging is the use of growth regulators (that control plant height and improve stem thickness). We tested two growth regulator products, an industry proprietary, labelled as PGR-A and Trinexapac-ethyl (Palisade). The latter has been used on wheat and barley to control lodging especially in Europe and some parts of the US but is not confirmed for the low desert. The first product (GR-A) with forecasted efficacy on controlling wheat crop lodging was developed recently. The trial was conducted at the University of California Desert Research and Extension Center (DREC) in Holtville, CA. Our project tested lodging and yield enhancement efficacy of the two plant growth regulators (both products are in a liquid PGR form) on a durum wheat crop under the low desert growers' cropping practices.

Procedures:

Durum wheat variety (Kronos) prone to lodging was used for the experimentation. The seed was supplied by Rubin's seed company, Brawley, California. The crop was sown in mid-December following standard growers' seeding rates (about 220 lb/acre) in 14 lines of 7" apart (about 45-50 seeds per ft^2). At time of planting or as split applications, 400 lb/ac N (granular) was applied equally to all treatment plots to match a higher-level growers' fertilization practices and served as a control (standard) treatment. All trial plots were provided with upper fertilizer level (representing an intensive fertility program) to promote potential lodging pressure. The experimental treatments, treatment application rates, and application schedule are as follows (Table 1);

Table 1: treatments, treatment application rates and schedules

TRTS	Trt names	Application @ 30-32 growth stage)1	Application at 37-39 growth stage (flag leaf stage)
T1	C (High fertility- HF)	NA	NA
T2	Test PGR 1 (HF)	PGR 25 fl oz	NA
T3	Test PGR 2 (HF)	NA	PGR 25 fl oz
T4	Test PGR 3 (HF)	PGR 14 fl oz	PGR 11 fl oz
T5	Palisade EC 1/ PGR (HF)	Palisade 14 fl oz	PGR 11 fl oz
T6	Palisade EC 2 / PGR (HF)	Palisade 14 fl oz	PGR 25 fl oz
T7	Palisade EC 3 (HF)	Palisade 14 fl oz	NA
T8	Control (Standard Fertility)	NA	NA

Each of the products were planned to be applied as tank mix following product label, and at different crop growth stages specified in Table 1. However, the tank mix was not applied as neither herbicide nor any other pesticides were needed during the crop growth cycle.

While Imperial soil may be rich in phosphorus, a single dose of Phosphorus and K were applied as pre-plant at a rate of 100 kg /ha P_2O_5 and K_2O. All fertilizers were applied as side dressing and received uniform watering up until anthesis. Shortly after sowing, all plots were irrigated with sprinklers to ensure uniform germination and emergence, followed by standard flood irrigation practices. At harvest (mid-May), plants from the middle 4ft wide x 10 ft long plot area were harvested, the grain separated from the straw was analyzed to determine grain yield and grain protein content at 12% moisture or less.

Results and discussion

This is a preliminary finding (s) from a one season field trial. Note that it is not the scope of this paper to submit all collected data and findings. Accordingly, we only present the most relevant findings in order to provide preliminary insights to the findings.

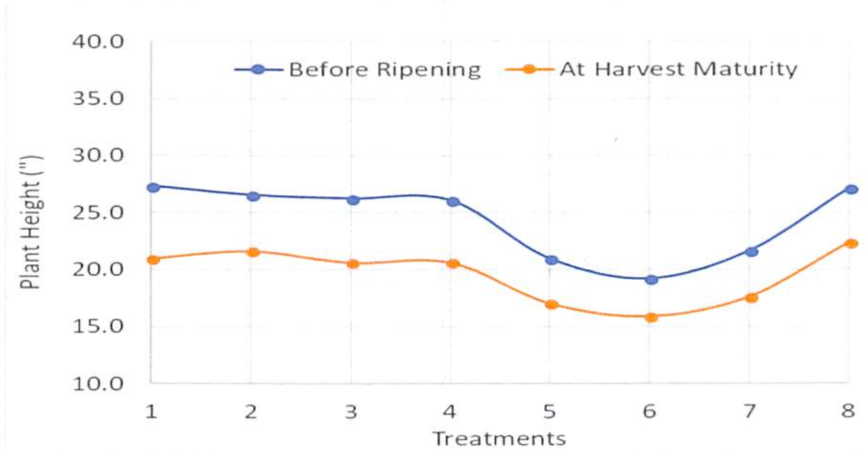

Figure 2: Plant height (10 plants per replication for all treatments

The results show that plants were shorter for all treatments when measured at harvest time (maturity) compared to height measurements taken just before ripening stage (Figure 2). The shorter plants at maturity is probably due to contraction as the plants mature and dry. Furthermore, plant heights for the high fertility regime (T1) and the standard fertility (T8) control treatments were similar (Figure 2), suggesting that plant height is not affected by crop fertilizer levels, at least within the range used in this experiment. Test PGR (both as single or split applications) (T2, T3 and T4) produced plants of the same height as the control treatments. On the other hand, Palisade (both single and split applications) treatments (T5, T6, and T7) resulted in shorter plants compared to those treated with the test PGR or the untreated control. Since, shortening plant heights are indications for resistance to lodging, Palisade, but not the

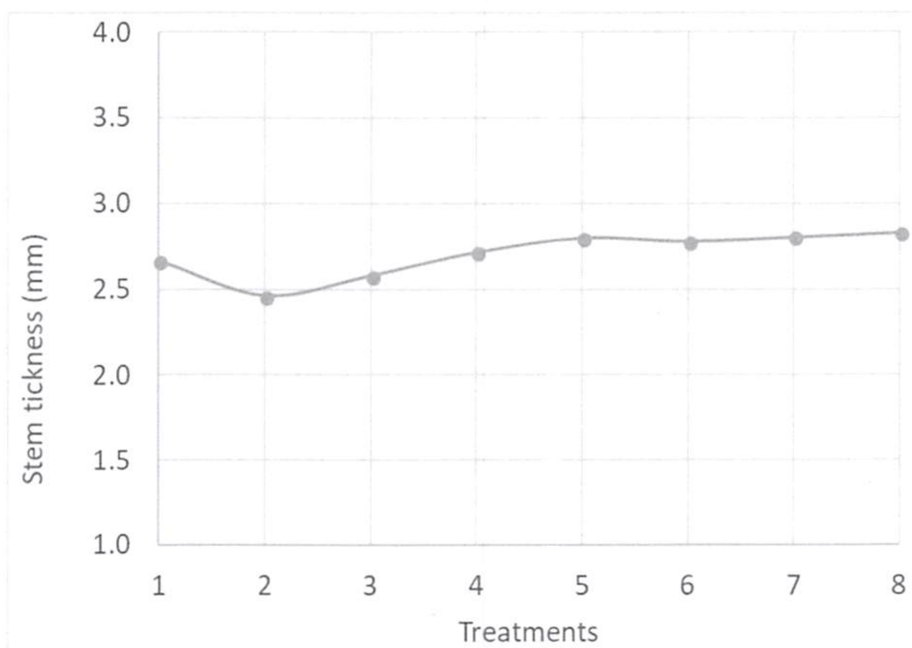

Figure 3: Plant stem thickness (average of 10 plants per replication for under various treatments

new industry product (PGR-A), may serve as a potential suppressant of wheat crop lodging under the low desert wheat growing conditions.

Similarly, all Palisade treatments (T5, T6 and T7), but not the PGR-A treatments, seem to have increased durum wheat stem thicknesses compared to the high fertility control treatment, but not the standard fertility control treatment (Figure 3). The highest stem thickness increase over the high fertility control treatment was about 4%. As stem thickness is also another parameter that suggests a potential tolerance to lodging, increased plant thicknesses with the use of Palisade may indicate its usefulness to overcome durum wheat lodging. High dose test PGR, be it at early or flag leaf stage applications, increased the number of plant heads per unit area. The development of more crop heads may be the only advantage for the PGR product. Figure 4 also suggests that high dose fertility is negatively associated with the number of heads per given area and is probably less productive than the standard fertility treatment. High dose fertility may enhance crop vegetative growth and suppress the reproductive development of the wheat crop.

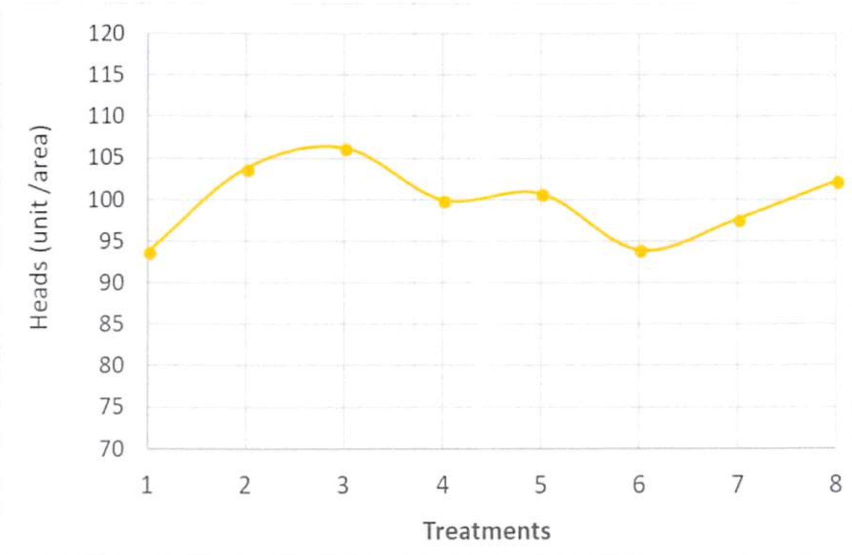

Figure 4: number of heads developed per unit area

Looking at grain protein contents the treated durum wheat, it was observed that Palisade treatments (all rates) enhanced grain protein content compared to the any of the test PGR or the control treatments (Figure 5). Test PGR (all treatments) produced less protein containing grains compared to the high and standard fertility T1 and T8 treatments.

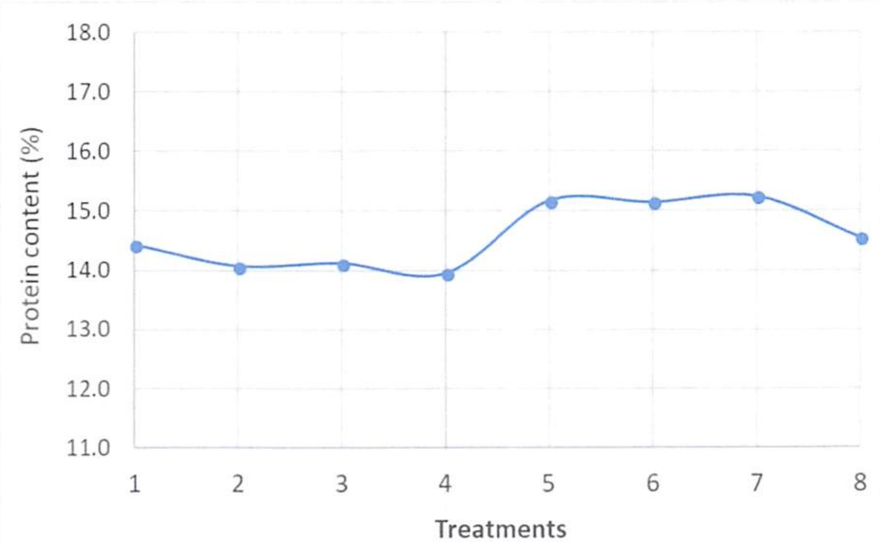

Figure 5: Grain protein content under various treatments

In summary, the relative durum wheat responses suggested that some plant growth regulators such as Palisade may provide promising suppression of wheat crop lodging. Wheat crop lodging has a devastating effect on low desert what fields. While the indicators of tolerance to wheat crop lodging (shorter and thick stem plants) helped to make such judgements, the actual poor crop germination and growth under all treatments made it difficult to observe an actual lodging evaluation. There was no lodging under any of the treatments. While there were indications for the efficacy of some products to regulate plant growth parameters and contribute to suppress crop lodging, a one season experiment is insufficient to provide any conclusive recommendations. The experiment will be repeated during the upcoming wheat growing season. We believe that a conclusive product evaluation will be made following the result we obtain from two consecutive years.

IMPERIAL VALLEY CIMIS REPORT AND UC WATER MANAGEMENT RESOURCES

Ali Montazar, Irrigation & Water Mgmt Advisor, UCCE Imperial & Riverside County

The reference evapotranspiration (ET_o) is derived from a well-watered grass field and may be obtained from the nearest CIMIS (California Irrigation Management Information System) station. CIMIS is a program unit in the Water Use and Efficiency Branch, California Department of Water Resources that manages a network of over 145 automated weather stations in California. The network was designed to assist irrigators in managing their water resources more efficiently. CIMIS ET data is a good guideline for planning irrigations as bottom line, while crop ET may be estimated by multiplying ET_o by a crop coefficient (K_c) which is specific for each crop.

There are three CIMIS stations in Imperial County including Calipatria (CIMIS #41), Seeley (CIMIS #68), and Meloland (CIMIS #87). Data from the CIMIS network are available at: http://www.cimis.water.ca.gov. Estimates of the average daily ET_o for the period of September 1 to November 30 for the Imperial Valley stations are presented in Table 1. These values were calculated using the long-term data of each station.

Table 1. Estimates of average daily potential evapotranspiration (ET_o) in inches per day

Station	September		October		November	
	1-15	16-30	1-15	16-31	1-15	16-30
Calipatria	0.26	0.23	0.21	0.18	0.13	0.11
El Centro (Seeley)	0.26	0.25	0.22	0.18	0.14	0.12
Holtville (Meloland)	0.26	0.24	0.20	0.16	0.13	0.11

For more information about ET and crop coefficients, feel free to contact the UC Imperial County Cooperative Extension office (442-265-7700). You can also find the latest research-based advice and California water & drought management information/resources through link below:
http://ciwr.ucanr.edu/.

COACHELLA VALLEY FARMERS EDUCATIONAL MEETING SCHEDULE FOR 2018-19

Where: Coachella Valley Mosquito And Vector Control District
43-420 Trader Place Indio CA 92201
Time: 12:00 pm to 1:15 pm

For: 2018

Month **Date** **Topic and Speaker**

August 15 Pepper Weevil and other important pests of Bell Peppers**:** John Trumble, Distinguished Professor, Department of Entomology, UCR

September 12 Grape Production/Disease Update: Carmen Gispert, UCCE Riverside County

October 10 Coachella Valley nematode crop problems: Antoon Ploeg, Associate Extension Nematologist, UCR

For: 2019

Month **Date** **Topic and Speaker**

February 13 Laws and Regulations Update for Riverside County: Ruben Arroyo, Riverside County Agricultural

March 13 Vegetable Diseases in the low desert: Alex Putman, Assistant Cooperative Extension Specialist, UCR

April 10 Pest and disease problems in Landscape Date Palms
Don Hodel, Environmental Horticulture Advisor, UCCE

Program sponsors are:
Coachella Valley Mosquito Vector Control District
California Department of Food and Agriculture
Coachella Valley Water District
UCCE Riverside County
Riverside County Agricultural Commissioners' Office

Some classes will have Continuing Education Credit and it will be noted on the program flyer that is sent out. When you get the meeting notice, please:
RSVP with Wendy @ 760-342-6437 or email to: wensmith@ucanr.edu, we need to know how many are registered ahead of time to order lunches for program participants.

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Preseason Vegetable Meeting
September 4, 2018
Yuma Agricultural Center

2.5 PCA (AZ) & 2.5 (CA) CEU's Have Been Requested

8:00-8:15am	Yuma County Cooperative Extension Update Russ Engel, Director, Yuma County Cooperative Extension
8:15-8:50	Lettuce Weed Control Update Barry Tickes, Area Agent & Director, LaPaz County Cooperative Extension
8:50-9:25	Insect Management Tips for Fall Produce and Melons John Palumbo, Extension Specialist, Entomology, Yuma Agricultural Center
9:25-10:00	Lettuce Disease Management Review Mike Matheron, Extension Specialist, Plant Pathology
10:00-10:20	BREAK
10:20-10:50	Return of El Niño: Implications for Crop & Pest Management Paul Brown, Extension Specialist, Biometeorology & Extension Program Director
10:50-11:20	Implementing FSMA's Co-Management Policy in the Real World Paul Rivadeneira, Extension Specialist, Food Safety & Wildlife
11:20-12:00	Update on the *E. coli* outbreak Investigation and Outcomes of the LGMA Task Force Channah Rock, Extension Specialist, Water Quality
12:00	LUNCH

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ALFALFA PRODUCTION MEETING

Thursday, 8 a.m., September 13, 2018, @ Blythe City Hall, multi-purpose room
235 N. Broadway, Blythe, California

8:00 **Registration 8:00-8:15**
8:15 **Climate and Water Update**
Dr. Paul Brown, University of Arizona Extension Specialist and Biometerology Research Scientist
8:45 **Water and Fertility Management of Alfalfa, and Implications for Pest Control**
Dr. Mike Ottman, University of Arizona Extension Agronomist
9:15 **Experiential Insights on Alfalfa Subsurface Drip Irrigation**
Local Grower Panel
9:30 **Alfalfa Product Update**
Don Miller, Alforex Seeds
9:45 **Alfalfa Products from Corteva AgriSciences, and Chlorpyrifos Update**
Kristen Nelson, Corteva AgriSciences
10:00 **Gowen Company Alfalfa Products**
Chris Denning, Gowen Company

10:15 **Break**

10:30 **Alfalfa Phymatotricopsis Root Rot Control**
Dr. Ayman Mostafa, Central Arizona Cropping Systems Extension Agent, University of Arizona
11:00 **Management of Pigweeds in Low Desert Alfalfa**
Dr. Bill McCloskey, University of Arizona Extension Weed Specialist
11:30 **Alfalfa Insect Pest Management Update**
Michael Rethwisch, Crop Production and Entomology Farm Advisor, University of California Cooperative Extension

Noon: Lunch, provided by our meeting sponsors Please RSVP by 9-11
Please RSVP to Michael Rethwisch 760-921-5064 Or Suzanne at 760-921-5060 (leave a message)

Application being made for CEU hours for Arizona, CCA, and California

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University of California, County of Riverside and U.S. Department of Agriculture Cooperating