UC CE UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources | UC Cooperative Extension

Imperial County Agricultural Briefs

May 2024 (Volume 27 Issue 5)

Features from your Advisors

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OPENET: A REMOTELY SENSED IRRIGATION MANAGEMENT TOOL FOR DESERT ALFALFA

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

Introduction. OpenET is a new online platform that uses satellites for mapping evapotranspiration (actual ET) at the scale of individual fields, and currently can be used across the western U.S. It builds upon decades of investment by NASA, USGS, NOAA, and the European Space Agency (ESA) to develop, launch, and operate a constellation of Earth observing satellites and to develop a platform for data processing and distribution to provide automated and widely accessible ET data at user-defined spatial scales and timeframes.

OpenET is produced at a spatial resolution of 30m x 30m (0.22 acres). Daily, monthly, and cumulative ET data are accessible on the OpenET Data Explorer. This satellite-based tool includes six models that are developed based on full or simplified implementations of the surface energy balance (SEB) approach or relies on surface reflectance data and crop type information to compute ET as a function of canopy density using a crop coefficient approach for agricultural lands. The model acronyms are *eeMETRIC, geeSEBAL, DisALEXI, SSEBop, PT-JPL*, and *SIMS*. In addition, OpenET provides the OpenET ensemble values calculated from an ensemble of the above six models (Figure 1).

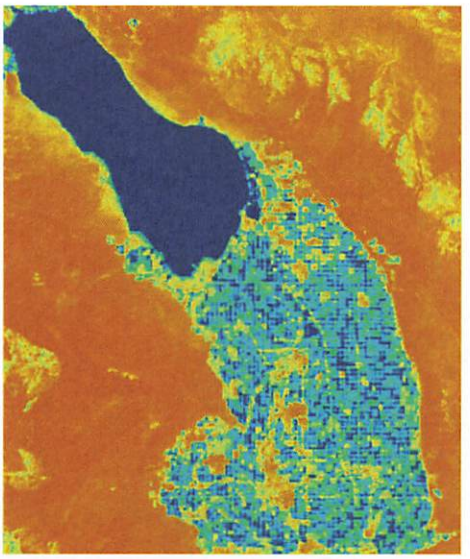

Figure 1. Cumulative OpenET ensemble evapotranspiration of the Imperial Valley in 2023. The data demonstrates that the annual ET varied from a few inches (dark brown areas) to more than 60 inches (dark blue areas).

As a user-friendly satellite-based irrigation tool, OpenET could assist growers to monitor crop water use in their farms on a yearly, monthly, weekly, or even daily basis. The tool may help for a better understanding of crop water use over the crop season and scheduling irrigation events more effectively and efficiently. Developing innovative and effective water management strategies is difficult without accurate and consistent information of crop ET, and that is why OpenET could be a useful decision-making tool to develop optimal irrigation

management strategies as well. This article provides an evaluation of OpenET on estimating alfalfa crop water use in the desert region.

OpenET and field measured data. The experiment was conducted in four commercial alfalfa fields in the Palo Verde Valley over three growing seasons of 2019 through 2021, while only the data of one field over the three-year period is adopted for this article. The field had a dominant soil texture of silty clay loam and was under furrow irrigation practice. The field was planted in October 2018 and was operated for alfalfa hay production over the study period. The actual crop water use (actual crop ET) was measured using the residual of energy balance method with a combination of surface renewal and eddy covariance equipment (Figure 2). The eddy covariance actual ET data was used to evaluate the OpenET satellite models and the OpenET ensemble ET model. The alfalfa field was harvested 25 times over the study period.

Figure 2. Fully automated surface renewal and eddy covariance ET station at the experimental field in the Palo Verde Valley.

Results. The actual ET varied widely for each crop harvest cycle and throughout the study years. The cumulative seasonal ET (measured by eddy covariance equipment) was 63.8, 60.6, 58.9-in for the 2019 season to 2021 season, respectively (Figure 3). Weather parameters, irrigation and other management practices, and harvest schedule could be considered as the main drivers of causing variations on the alfalfa crop water use over the three seasons.

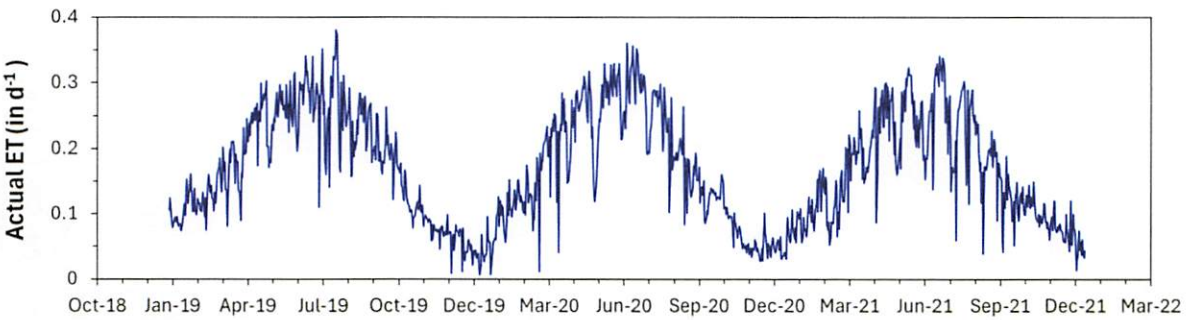

Figure 3. Daily alfalfa crop water use over the study period (the measured data in the eddy covariance station from January 1, 2019 through December 31, 2021).

The daily alfalfa water use varied widely within the crop seasons and over each season. In the 2019 season for instance, the ET amount was 0.08-in after cutting in March and raised up to 0.38-in at full canopy crop in mid-July. The amounts were 0.05-in and 0.34-in in the 2021 season, respectively.

A comparison was conducted between the daily estimated crop water use by the OpenET models (and the ensemble OpenET) and the measured actual ET over study period (Figure 4). The results demonstrated that the *PT-JPL, geeSEBAL and DisALEXI* models provided relatively accurate estimates of annual ET for the experimental field, while the daily ET data estimated by the *PT-JPL* model had a better agreement with the measured daily ET data. The *SSEBop* and *eeMetric* models overestimated the cumulative ET amounts (6-8% points).

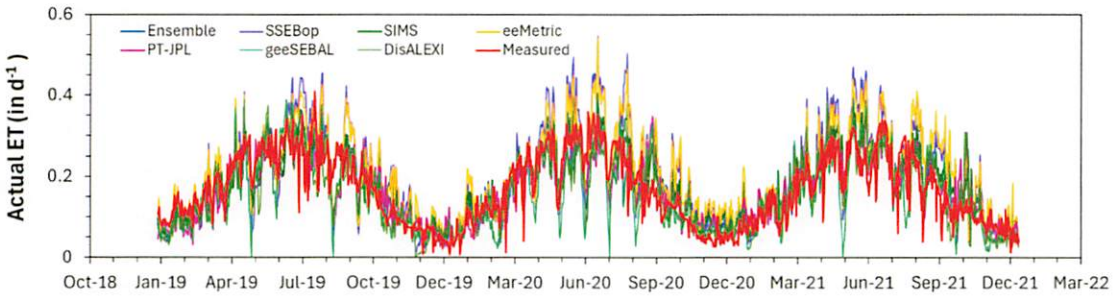

Figure 4. Daily estimated ET by the OpenET models and measured ET using eddy covariance equipment in the alfalfa experimental field over a three-growing season (January 1, 2019, though December 31, 2021).

Results shown in Figure 5 provide evidence of good agreement of the OpenET ensemble daily crop water use estimates with the flux tower ET data across the experimental years. The slope of the best fit line for ensemble model was 0.73 and the overall RMSE (Root Mean Square Error) value of ensemble daily ET calculated was 0.047 in d^{-1}.

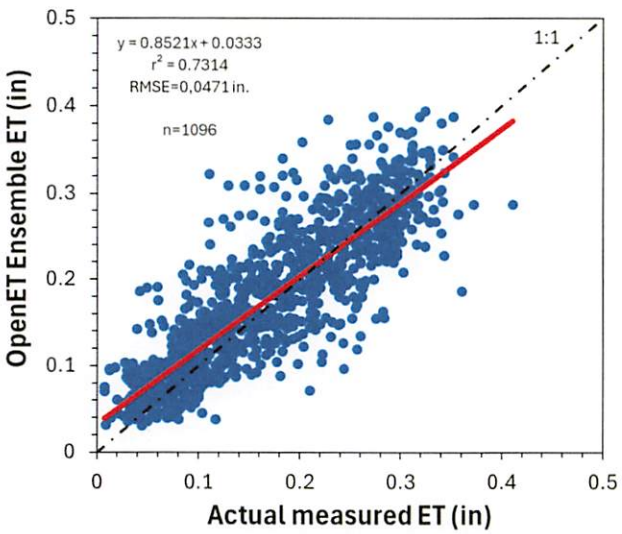

Figure 5. A comparison of the OpenET ensemble estimated daily ET versus the measured daily actual ET at the experimental site. A three-year data set was adopted for this analysis.

Recommendation. While more comprehensive evaluations will be conducted for the diverse cropping systems of the low desert region, this case study demonstrates a good agreement between the results of OpenET (*PT-JPL, geeSEBAL* and *DisALEXI models*) and field measurements for alfalfa crop. As a user-friendly satellite-based irrigation tool, it is recommended growers consider using OpenET ensemble data to manage water in desert alfalfa.

Excess irrigation can be considered beneficial water use for salinity management in the desert region, as the 3-in annual rainfall of the region is insufficient to accomplish this task. In other words, 63.8 ac-in/ac actual ET reported for the experimental alfalfa field in the 2019 season is just alfalfa crop water use during this specific season. The amount of additional irrigation water to effectively drain salt from the crop root zone depends on the soil circumstances and level of salinity. The irrigation water that needs to be applied in an individual field depends on crop water requirements (actual ET that could be obtained from the OpenET ensemble), irrigation system efficiency, and salt leaching requirements.

ALFALFA RESPONSE TO LATE WINTER APPLICATIONS OF FOLIAR NITROGEN FIXING BACTERIA PRODUCTS

Michael D. Rethwisch, Farm Advisor - Crop Production and Entomology

Several new products containing bacteria species that fix nitrogen in plants apart from nodules on roots have become available in the past several years. Some examples of these products include ProveN®, Envita®, Utrisha® N and BlueN™. The products differ in the bacteria species contained, with the ProveN, ProveN® 20 and ProveN® 40 series of products contain *Kosakonia sacchari* and/or *Klebsiella variicola*, while Envita® uses *Gluconacetobacter diazotrophicus*. Utrisha® N and BlueN™ use *Methylobacteria symbioticum* as the bacterial species.

As these products are newly available, few data from replicated field trials in the low desert are available. The majority of university trials thus far in the low desert of California have been conducted on late winter alfalfa, with applications made during February-March. Field conditions and plot sizes have ranged from small plots of established alfalfa infested with cowpea aphids, to first year hay with commercial plots ranging from 5.5-8.25 acres in size which compared swather applications to later foliar applications.

In 2022 BlueN™ was evaluated. BlueN™ contains *Methylobacteria symbioticum* as the bacterial species and is an OMRI approved product, while another product which contains this bacteria (Utrisha® N, marketed by Corteva AgriScience) is not OMRI approved.

BlueN™ was applied at 5 oz./acre in combination with 1 oz./acre of Transform® WG insecticide to established (2nd or 3rd year of growth) alfalfa that was infested with cowpea aphids and later blue alfalfa aphids on three dates in the same field. Average stem heights on these dates were: Feb. 14 = 3.55"; Feb. 18 - 5.95"; Feb. 24 = 9.0".

Yield and quality data were obtained at harvest. Data indicated that addition of BlueN™ to Transform® WG was consistently beneficial, resulting in an average yield increase of just under 200 lbs./acre more than Transform® WG (Table 1) while also increasing relative feed value (RFV) by an average of just over 5 points (Table 2) when compared with Transform® WG.

Table 1. Mean Established Alfalfa Hay Yields (lbs./acre) Following Treatment Application at Various Points of Regrowth, Blythe, CA, 2022.

Treatment and Rate/Acre	Treatment Date			
	Feb. 14	Feb. 18	Feb. 24	Average
Transform® WG 1 oz.	2,490 a	2,416 a	2,314 ab	2,407 ab
BlueN™ 5 oz. + Transform® WG 1 oz.	2,608 a	2,439 a	2,618 a	2,589 a
Untreated	2,403 a	2,195 a	2,154 b	2,251 b

Means in columns followed by the same letter are not statistically different at the P<0.05 level of probability (Student's T Test, JMP Pro 16.0.0)

Table 2. Mean Alfalfa Hay Relative Feed Values Following Treatment Application at Various Points of Regrowth, Blythe, CA, 2022.

Treatment and Rate/Acre	Treatment Date			
	Feb. 14	Feb. 18	Feb. 24	Average
Transform® WG 1 oz.	188.2 a	181.5 a	191.8 a	187.2 b
BlueN™ 5 oz. + Transform® WG 1 oz.	188.6 a	189.7 a	199.0 a	192.4 ab
Untreated	190.1 a	194.8 a	202.5 a	195.8 a

Means in columns followed by the same letter are not statistically different at the P<0.05 level of probability (Student's T Test, JMP Pro 16.0.0)

In 2024 a wettable (WG) formulation of Envita® (Azotic Technologies) was applied to first year alfalfa at the March cutting via swather and was compared with a later application by sprayer application to foliage. Envita® WG was applied at 4 grams/acre via swather and 5 grams/acre via spray application made by commercial ground sprayer.

It should be noted that Envita® is presently available in the U.S. as Envita® SC and the use rate is 0.8 fl. oz./acre. The Envita® SC formulation also has OMRI certification. Envita® WG is commercial internationally and is intended to be commercially available in the U.S. in 2025. The recommended Envita® WG use rate is 5 grams/acre.

Results from the experiment in 2024 found that both application timings and methods the earlier resulted in higher alfalfa yields (Table 3), with the swather application providing the best economic returns due to highest yields and slightly less product applied.

It should be noted that these are the results of just a single replicated field trial, and additional testing is necessary to have increased confidence in the results. Additional data will be collected to document effects and longevity of product activity in upcoming cuttings.

Table 3. Mean hay yields and quality of first year alfalfa cut April 16 following application of Envita® WG via swather or sprayer in March 2024, Ripley, CA.

Treatment and Method	Alfalfa Yield (Lbs./acre)	Reported at 90% Dry Matter						Reported at 100% Dry Matter	
		% Crude Protein	% Acid Detergent Fiber (ADF)	% Neutral Detergent Fiber (NDF)	% Fat	% Lignin	Net Energy (mcal/lb.)	TDN (Total Digestible Nutrients)	Relative Feed Value (RFV)
Envita® WG* 4 g./acre via swather on March 6	1,854 a	20.2 a	24.1 a	29.2 a	1.75 a	5.27 b	0.653 a	62.3 a	195.3 a
Envita® WG 5 g./ acre applied to foliage on March 19**	1,761 a	19.6 a	24.5 a	30.1 a	1.77 a	5.44 a	0.650 a	61.9 a	188.4 a
Untreated	1,547 a	19.6 a	24.1 a	29.8 a	1.76 a	5.27 b	0.657 a	62.2 a	191.4 a
P value between mean extremes	*0.284*	*0.24*	*0.186*	*0.177*	*0.7575*	*0.0345*	*0.134*	*0.1796*	*0.1669*

Means in columns followed by the same letter are not statistically different at the P<0.05 level of probability (Student's T test, JMP Pro 17.0.0). Note: Three replications/treatment.

**Applied at 20 gpa. Included in solution were Buffer PS, Besiege Insecticide, and DyneAmic at 0.25% v./v.*

*** Applied at 10 gpa. Solution also included 32 oz./acre of RoundUp PowerMax 3, and 0.25% Smoke.*

Overall, results from alfalfa experimentation with both products that fix nitrogen in plant leaves have been consistently positive for alfalfa yield increases in the first cutting following applications during late winter.

University studies have not been initiated low desert alfalfa during later spring/summer months to determine if similar consistent results will occur when drier conditions exist with higher ultraviolet light conditions, as both could potentially have detrimental effects on exposed bacteria on plant leaves prior to their entering alfalfa leaves and stems.

SUDANGRASS FORAGE QUALITY CAN BE AFFECTED BY FERTILIZER AND IRRIGATION WATER LEVELS

Oli Bachie, Brooke Latack, and Ali Montazar, UCCE Imperial County Advisors

Backgrounds

Sudangrass responds very well to supplemental fertilizer input. Having extensive root systems, sudangrass can effectively take up and store excessive soil nitrogen (Hirel, et al., 2011) into its tissue. The recommended fertilizer dose for quality sudangrass production in the low desert is about 100 lbs N as pre plant (considering no fertilizer residues in the field) and 50-60 lbs N applied to the crop after each cutting (Bachie, 2021), with a seasonal nitrogen (N) requirement of 320 to 400 lbs actual N per acre throughout its growing season. In anticipation to maximize hay production, growers of the low desert commonly apply large quantities of N fertilizers in the production of sudangrass hay, at rates varying from 150 to over 800 lbs N/acre during its growing cycle. High levels of supplemental fertilizer could result in higher sudangrass tissue nitrate concentration and/or prussic acid concentration, making the hay toxic to livestock. Hay importers often complain about excessive nitrate levels in sudangrass hay.

This research is conducted to assess effects of supplemental fertilization and irrigation water on sudangrass hay quality and tissue nitrate composition. The study is being conducted at the UC ANR Desert Research and Extension Center (DREC), in Holtville, California. Three fertilizer rates (sub plots) consisting of (1) lower rate of 50lbs of fertilizer N / acre at each cutting, (2) medium rate conventional N fertilizer rates of 80lbs of fertilizer N / acre, and (3) high N fertilizer at 100lbs N / ac at successive cuttings were used as fertilizer treatments. Three irrigation strategies (main plots) are: (1) 80% ET, (2) 100% ET, and (3) 120%ET. ET stands for crop evapotranspiration.

Preliminary findings

In our previous report (Bachie et al., 2024), we showed that Sudangrass biomass production for two subsequent cuttings were not significantly different between fertilizer application rates or irrigation treatments.

Similarly, nutrient components of sudangrass did not vary largely (although there is no statistical analysis for, we only assessed hay quality from a non-replicated sampling) among supplemental fertilizer levels or irrigation rates. Crop nutrition levels for all treatments were consistent or linear relationships for crude protein, ADF, NDF, Ash, and TDN (Figure 1), and are at a level desirable for sudangrass hay. However, sudangrass hay produced under all fertilizer and irrigation treatments had elevated tissue Nitrate-N (above 2000 ppm), above the threshold for possible acute toxicity level for livestock (Figure 2). Since the data is from a non-replicated sampling, it is difficult to decide if this variation is significant or not. Scientists suggested that drought and moderately high rates of nitrate fertilizer applied pre-plant or in-season in low moisture conditions increase forage nitrate contents. Since all fertilizer levels produced hay that contained higher nitrate concentration than a desirable and healthy nitrate content of hay (Figure 2), it is suggested that no more than 50 lbs / N fertilizer per acre after every cutting is necessary to produce non-livestock toxic sudangrass hay. None of the fertilizer or treatments produced forage with prussic acid, toxic compound for livestock in sudangrass hay.

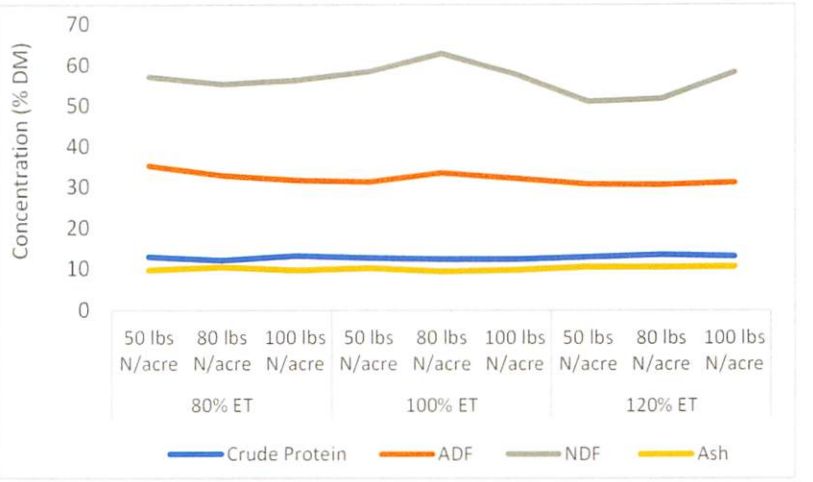

Figure 1: Sudangrass forage nutritional components.

There were no significant differences between hay quality among low and high fertilizer applications or irrigation levels. While hay quality grades are usually determined primarily by chemical analyses (such as crude protein, acid detergent fiber, neutral detergent fiber, TDN) nitrate and prussic acid contents of a forage crop are important components of toxicity measures to livestock. In this study, there was a higher risk of accumulating higher nitrate nitrogen in the tissues of sudangrass, even at the lowest fertilizer treatment. In other words, all fertilizer treatments

resulted in elevating sudangrass nitrate concentration to higher than the possible forage acute toxicity level. Growers usually apply higher fertilizer rates than the levels we used for this project, hence are prone to producing a greater risk forage that may result in higher possibilities of losing substantial revenue because of poor hay quality. Nitrates accumulate in the lower portion of sudangrass stem. Experts described hay with nitrate-nitrogen concentrations less than 1,200 PPM as generally safe, 1,200 to 2,300 PPM as potentially safe (though problems could occur at this concentration, particularly with pregnant livestock). Concentration of above 2,300 ppm is often considered toxic and unsafe to feed to livestock. All samples showed concentrations of nitrate-nitrogen above this toxic concentration (Figure 2). Our finding suggests growers using even as low as 50 lbs/ ac N fertilizer may risk producing sudangrass with potential nitrate toxicity. Hence, farmers should make efforts to grow sudangrass with less nitrogen fertilizer supply and meet the demands of the export market, which calls for a product with less than 2000 ppm of nitrate.

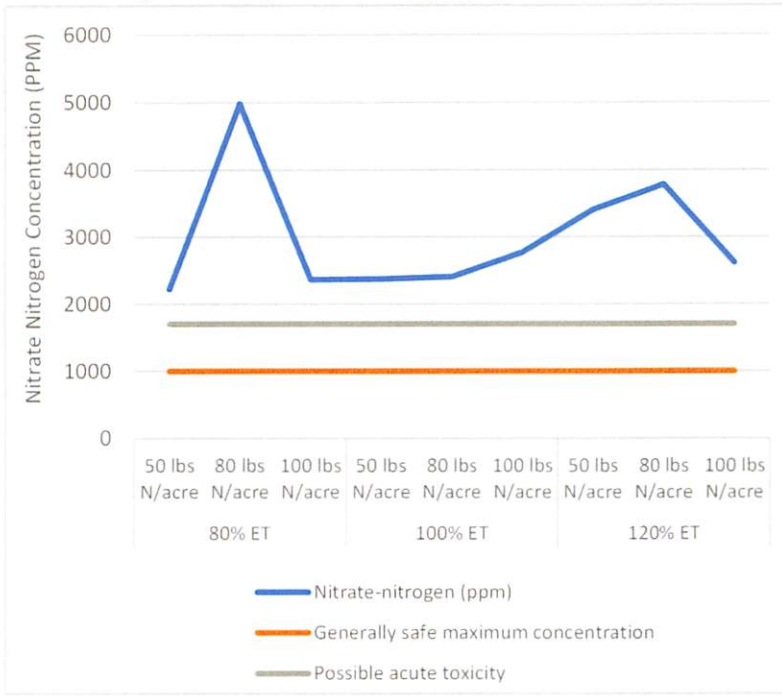

Figure 1: Sudangrass tissue nitrate-N

The findings did not confirm the presence of prussic acid, regardless of containing high nitrate tissue concentrations. Prussic acid was not detected in any of the samples from any of the treatment levels. The findings of no prussic acid in any of our samples are just preliminary and can't be conclusive until complete evaluation of the project findings. Our next sampling will consider sample collection from extended curing for prussic acid analysis. Although tissue nitrate concentrations in sudangrass may have increased due to N fertilizer applications, fertilizers may not be the only cause of high tissue nitrate accumulation.

In summary, high fertilizer applications can promote luxury N consumption and increase sudangrass tissue nitrate accumulation, causing more than normal tissue nitrate concentration and resulting into toxic levels of nitrate. Some researchers suggested that tissue nitrate accumulation and prussic acid levels are normally highest in lush regrowth following heavy fertilization with nitrogen, or in crops stunted by moisture stress, or higher irrigation rate that increases fertilizer distribution for crop uptake. Sorghum-family forages accumulate nitrates when there is plenty of soil nitrogen, but not enough water or sunlight to drive plant cell growth. When sorghum-family forages are cut for hay, prussic acid dissipates as the hay dries, hence hays are safe to feed once bales have reached the stable storage phase (Cassida, 2012). All sorghum family plants can also cause prussic acid or cyanide poisoning in livestock as they contain a secondary compound called dhurrin, which is enzymatically converted to toxic prussic acid (also called hydrocyanic acid) in wilting forage (Cassida, 2012).

Sudangrass tissue nitrate levels in hay may also be reduced by swathing sudangrass at 6 to 8 inches height (nitrates accumulate in lower stem of sudangrass), swathing in the afternoon or early evening, allowing plants to metabolize stem nitrates to protein, avoiding additional fertilizer applications during drought years, diluting high nitrate feed with low nitrate feed, avoiding feeding any feed with > 1.5% NO_3 content to pregnant cows, split applications of fertilizer (McGuir, 2003), and adapting cattle to high nitrate feeds over time. This is a very preliminary finding to suggest that growers should monitor their sudangrass plant (testing the lower stem for nitrate during summer), watch for supplemental fertilizer amounts to a level that do not accumulate higher than normal tissue nitrate concentrations in sudangrass.

References

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Hirel, B., et al. 2011. Improving Nitrogen Use Efficiency (NUE) in Crops for Sustainable Agriculture. Sustainability 3: 1452-1485)

McGuir A. 2003. Sudangrass and Sorghum-Sudangrass Hybrids; cover crops for the Columbia Basin. Washington State University. Cooperative Extension

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Onion Foliar Diseases: Post Harvest Cultural Recommendations.

Ana M. Pastrana
Plant Pathology Advisor - Imperial, San Diego, and Riverside
ampastranaleon@ucanr.edu
May 2nd, 2024

Onion Foliar Diseases:

During the 2023-24 crop season, several onion growers in the Imperial, Palo Verde, and Coachella Valleys faced various foliar diseases, including downy mildew, Stemphylium leaf blight, purple blotch, and occasionally powdery mildew. These pathogens can spread throughout production areas each year, negatively impacting nearby and distant producers. To address these challenges, implementing cultural management methods becomes crucial. Here, you'll find some cultural methods aimed at reducing the inoculum levels of these pathogens in your fields.

RESIDUE MANAGEMENT:

Sanitation plays a crucial role in disease prevention!

While spores from these diseases can be carried by equipment and insects, wind is the primary mode of dispersal. **Proper sanitation of onion debris is crucial.** It's essential to:

- Incorporate this material into the soil **immediately after harvest** and well ahead of planting the next crop.
- Ensuring that **no exposed plant debris remain in the growing region** at the time of next planting is imperative.

CROP ROTATION:

- To enhance the effectiveness of your rotations, strive for a **three- or four-year cycle** excluding all allium crops. Furthermore, take into account neighboring fields.
- **Manage wild and volunteer alliums** in nearby areas. These plants can act as reservoirs for diseases during non-cropping years, impacting the success of your rotations.

WEED MANAGEMENT:

Considering the wide range of hosts these pathogens can affect, it is advisable to implement management practices to **control weeds within and around onion fields**.

SOIL SOLARIZATION

This method, originating in the mid-1970s, utilizes heat to control pests in field soil. Early 20th-century practices, like mid-summer cultivation in California's Imperial Valley, highlighted soil exposure to high temperatures for pest control. Today, modern solarization techniques employ plastic film mulch to trap solar energy. Recognized by USDA Organic standards and other certifications, it's vital for growers in pest-prone areas or those dealing with diseased plant debris, as it can greatly

References: Stapleton et al., 2016. https://eorganic.info/sites/eorganic.info/files/u27/1.1.2-Stapleton-Biosolarization-Final.pdfhere

SURVEY

Ana M. Pastrana, Plant Pathology Advisor in Imperial, San Diego, & Riverside Counties

Surendra Dara, a previous CE Advisor on the California Central Coast for several years before moving to Oregon State University, is surveying to evaluate the knowledge and use of biocontrol and microbiocontrol options for pest management primarily in California. Those that operate in other states are also welcome to complete this survey. He will be using the data from this anonymous survey, along with the information he gathered from the Pacific Northwest, for a scientific presentation and a report and also to work with colleagues and industry partners in developing research and education strategies. Here is the link:

https://oregonstate.qualtrics.com/jfe/form/SV_2t6szOEbmryTpNs.

Thank you very much in advance for your help!

Artificial Intelligence for Sustainable Agriculture

Sustainable Agriculture with Artificial Intelligence Extension Workshop

Date: May 7, 2024

Location: UCR Palm Desert Center
75080 Frank Sinatra Dr, Palm Desert, CA 92211

With: University of California, Riverside, University of California ANR, Colorado State University Extension, Kansas State University, University of Arizona, Central Arizona Project, USDA-ARS

Registration Link: Sustainable Agriculture with AI Extension Workshop Registration Link

Agenda:

08:00 – 08:10	Welcome and introduction. Khaled Bali, UCANR
08:10 – 08:30	Harnessing the Benefits of Artificial Intelligence for a More Productive and Efficient Agriculture. Raj Khosla, Kansas State University.
08:30-09:00	AI for precision nitrogen and water management in row crops. Raj Khosla, Kansas State University.
09:00-09:30	CropManage Decision Support Tool for Irrigation and Nutrient Management. Michael Cahn, UCANR.
09:30-10:00	Citrus Crop Water Use and Open ET in the low desert Region of California. Daniele Zaccaria, UC Davis.
10:00-10:15	Break
10:15-10:45	Estimate Soil Moisture Tension using Remote Sensing and Land Surface Parameters in the Central Valley of California. Nan Li, UCR
10:45-11:15	Promises and pitfalls of drip irrigation in the desert cropping systems, Ali Montazar. UCANR
11:15-11:45	Deficit irrigation Strategies for Alfalfa in California. Khaled Bali, UCANR
11:45- 12:15	Environmentally Conscious Practices for Managing Soilborne Diseases in Low Desert Vegetable Production. Philip Waisen, UCANR
12:15-1:00	Lunch
1:00-1:30	On-farm water conservation projects- Surface irrigation. Peter Moller, Rubicon water.
1:30-2:00	On-Farm water conservation projects- Linear move, Basin, and subsurface drip irrigation (Ronnie Leimgruber- Grower, Imperial Valley)
2:00-2:30	Alternative cropping systems for the low desert region of California- Olives and other crops (Rick Benson- Grower, Imperial Valley)
2:30-3:00	Discussion

List of speakers and contact information:

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Raj Khosla
Raj Khosla, PhD | Kansas State University (k-state.edu)
Mike Cahn
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Philip Waisen
Home Page - Division of Agriculture and Natural Resources (ucanr.edu)
Peter Moller
Peter Moller | LinkedIn
Ronnie Leimgruber
(20+) #FarmerFriday Ronnie Leimgruber is... - Imperial County Farm Bureau | Facebook
Rick Benson
Meet Our Growers - California Ripe Olives - California Ripe Olives (calolive.org)

PLEASE LET US KNOW IF YOU NEED SPECIAL ACCOMMODATION

Contact Khaled Bali by text or email 760-554-1146, kmbali@ucanr.edu

Artificial Intelligence for Sustainable Agriculture

USDA NIFA
United States Department of Agriculture
National Institute of Food and Agriculture

THE UNIVERSITY OF ARIZONA | Environmental Science

USDA Agricultural Research Service

KANSAS STATE UNIVERSITY

Artificial Intelligence for Sustainable Agriculture

UC RIVERSIDE

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COLORADO STATE UNIVERSITY
EXTENSION

CAP
CENTRAL ARIZONA PROJECT

UC ANR

UC CE UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources Cooperative Extension

Agronomic Crops and Irrigation Water Management Workshop

May 15, 2024

Location:
Barbara Worth Country Club
2050 Country Club Dr., Holtville, CA 92250

Registration link: Link

	8:00 a.m. – Noon
7:30	Registration
8:00	**Opening Remarks -** *Ryan Kelley, Imperial County Board of Supervisors (BOS) - District 4*
8:10	**Challenges Due to Climate Change and Tools and Resources to Manage Risks in Agriculture -** *Tapan Pathak, CE Specialist in Climate Adaptation in Agriculture, University of California, Merced*
8:30	**UCCE Irrigation and Water Management Research in Recent Years -** *Ali Montazar, Irrigation and Water Management Advisor, UCCE Imperial County*
8:50	**Update on the Colorado River Water Situation -** *Bart Fisher, Palo Verde Valley Irrigation District Board of Trustees and Fisher farms*
9:05	**IID Conservation Update -** *Tina Shields, Water Department Manager, Imperial Irrigation District*
9:20	**Learning from Grower Panel: Successful Stories, Concerns, and Solutions on Irrigation Technologies and Water Conservation -** *Ronnie Leimgruber, Leimgruber Farms; Alex Jack, Jack Brothers Farms; Larry Cox, Lawrence Cox Ranches*
10:00	**New LI-710 Sensor to Measure Actual Evapotranspiration -** *Sasha Ivans, LI-COR Environmental*
	Break (10 minutes)
10:20	**Update on the Improved Alfalfa Varieties for a Water-Challenged Future –** *Charles Brummer, Director of the Plant Breeding Center, University of California, Davis*
10:40	**Enhancing Sudangrass Hay Production and Quality** - *Oli Bachie, Agronomy Advisor, UCCE Imperial County*
11:00	**The Top 10 Violations of 2023 -** *Julian Lopez, Deputy Agricultural Commissioner, Pesticide Use Enforcement, Imperial County*
11:20	**Spider Mites and Low Desert Alfalfa** - *Michael Rethwisch, Crop Production and Entomology Advisor, UCCE Riverside, Blythe (Palo Verde Valley Office)*
11:40	**Sudangrass as a Rotation Crop for Nematode and Soil Health Management in the Low Desert Cropping Systems** - *Philip Waisen, Vegetable Crops Advisor, UCCE Riverside County (Indio office)*
12:00	**Lunch -** Please stay for lunch.

For additional information on the workshop, please contact Ali Montazar, amontazar@ucanr.edu or *Oli Bachie*, obachie@ucanr.edu or call us at (442) 265-7700.

Approved Continuing Education Units:

California DPR (Course ID #DPR-1057-24 – 1 hr.), Arizona Dept. of Agriculture (Course ID #24813 - .75 hr.), CCA (Tracking No. #CA 61577 – 3.5 hrs.)

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2024 California Date Palm Workshop

May 22, 2024

Location:
Coachella Valley History Museum
82616 Miles Ave, Indio, CA 92201

Registration link: Link

	8:00 a.m. – Noon
7:30	Registration
8:00	**Welcome address** - *Ali Montazar, UCCE Irrigation and Water Management Advisor & Gordon Chuchian, Chairman of CA Date Commission*
8:10	**Opening Remarks -** *Brent Hales, Associate Vice President, Research and Cooperative Extension, University of California Agriculture and Natural Resources*
8:15	**IPM in Dates: Past, Present, and Future** - *Thomas Perring, Professor Emeritus, Department of Entomology, UC Riverside*
8:40	**Updates on the South American Palm Weevil Invasion in Southern California** - *Mark Hoddle, Professor of Extension in Biological Control, UC Riverside*
9:05	**Update on Date Irrigation Management Research -** *Ali Montazar, UCCE Irrigation and Water Management Advisor in Imperial, Riverside and San Diego Counties*
9:25	**Update on Date Fertilization Research -** *Robert Krueger, Horticulturist & Research Leader, USDA-ARS National Clonal Germplasm Repository for Citrus & Dates*
9:45	**Date Palm Crop Insurance Overview -** *Jonquil Henderson, Risk Management Specialist, USDA-Risk Management Agency*
	Break (10 minutes)
10:15	**Update on Changes to Laws and Regs Regarding Pesticide Use in California -** *Daniel Delgado, Deputy Agricultural Commissioner, Riverside County*
10:40	**Update on Herbicide Evaluation in Date Palms -** *Peggy Mauk, Director of Agricultural Operations and Professor of Extension, UC Riverside*
11:00	**Management of Mite Pests of Date Palms -** *Bodil Cass, Assistant Professor/Extension Specialist - Subtropical Fruit IPM Lab, UC Riverside*
11:20	**Date Palm Research at the University of Arizona** - *Glenn Wright, Professor and Extension Tree Fruit Specialist, University of Arizona*
11:40	**Pollen Management and Pollination in the Date Palm -** *Ricardo Salomón Torres, Research Professor at Universidad Estatal de Sonora San Luis Río Colorado, Mexico*
12:00	**California Date Commission Reports** Lunch - Please stay for lunch.

For additional information on the workshop, please contact Ali Montazar, amontazar@ucanr.edu or Kristy Kneiding, kkneiding@datesaregreat.com

Approved Continuing Education Units:
California DPR (Course ID #DPR-1058-24 – 2 hrs.), Arizona Dept. of Agriculture (Course ID #24814 - 1.0 hr.) & CCA (Tracking No. #CA 61576 – 3.0 hrs.)

IMPERIAL VALLEY CIMIS REPORT AND UC WATER MANAGEMENT RESOURCES

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

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 are 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 include 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 May 1st to July 31th 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 inch per day

Station	May		June		July	
	1-15	16-31	1-15	16-30	1-15	16-31
Calipatria	0.27	0.29	0.31	0.32	0.32	0.31
El Centro (Seeley)	0.29	0.31	0.34	0.36	0.33	0.31
Holtville (Meloland)	0.29	0.31	0.33	0.34	0.32	0.31

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/.

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