Imperial County Agricultural Briefs

UC CE | UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources

Features from your Advisors

December 2022 (Volume 25 Issue 11)

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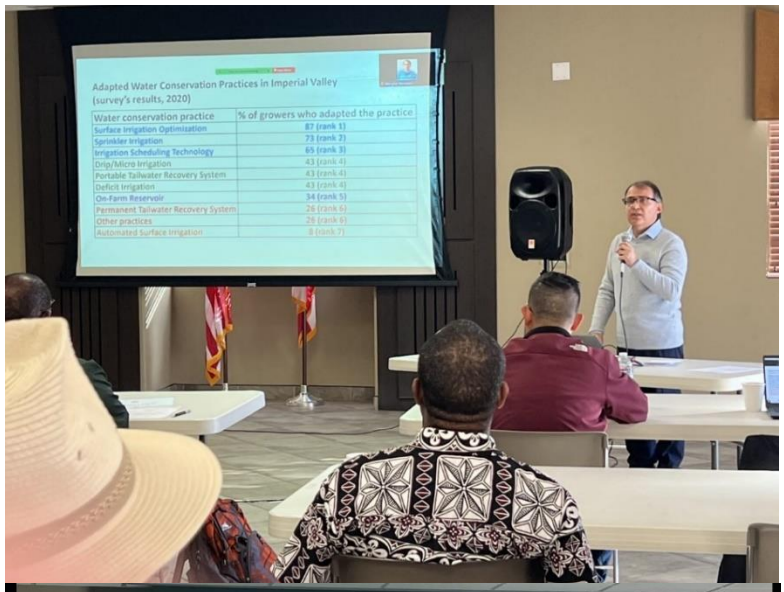
33rd ANNUAL FALL DESERT CROPS WORKSHOP

Oli Bachie, Director, UCCE Imperial & San Diego Counties; Agronomy Advisor, UCCE Imperial, Riverside, and San Diego Counties
Ali Montazar, Irrigation & Water Mgmt Advisor, UCCE Imperial, San Diego and Riverside Counties

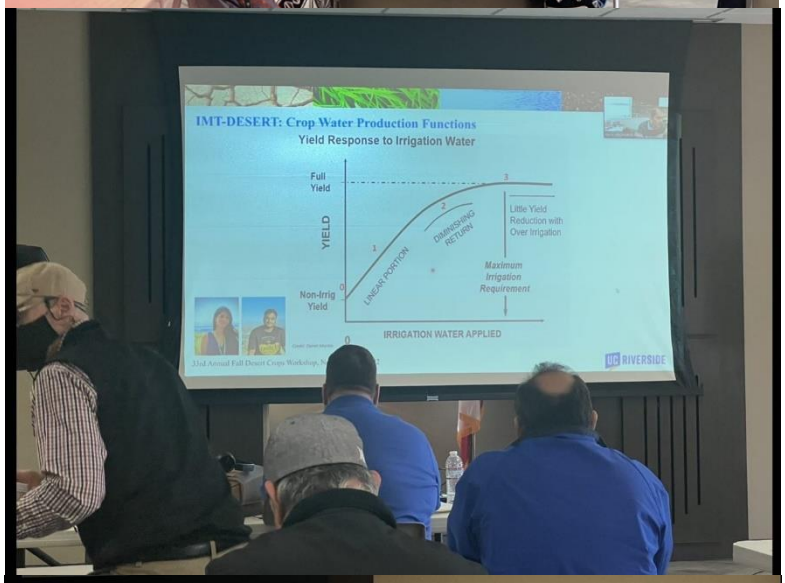
University of California Cooperative Extension - Imperial County held its 33rd "Fall Desert Crops Workshop" at Farm Credit West in Imperial on November 30th. The workshop was run as a hybrid event with in-person and virtual speakers and attendees. At this event, 15 speakers from UC Riverside, UCCE Imperial and Riverside Counties, University of Arizona, Imperial County Agricultural Commissioner Office, Imperial Irrigation District, Western Farm Press, and water industry and private sectors came together to bring innovative ideas and solutions; and disseminate the outcomes of their recent studies and experiences in the desert region. The event was co-organized by UCCE Imperial County advisors; Ali Montazar and Oli Bachie. We thank all presenters, growers, industries, and other participants for making this event successful.

Cuong Nguyen, UCCE Food Safety and Organic Production Advisor, delivers a talk on food-grade solution for organic produce disinfection.

Carlos Ortiz, Imperial County Agricultural Commissioner, delivers a brief on the current pests of concern in Imperial County.

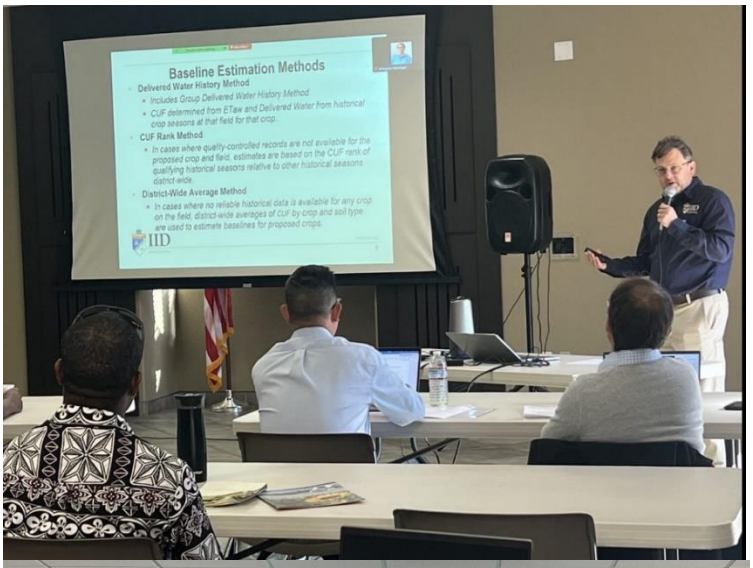


Ali Montazar, UCCE Irrigation and Water Management Advisor, delivers a talk on effective water conservation practices in the low desert region.



Amir Haghverdi, Associate CE Professor of Irrigation and Water Management at UC Riverside, delivers a talk on IMT-DESERT: An irrigation management tool for southern California desert region (this talk was presented virtually).

Philip Waisen, UCCE Vegetable Crops Advisor, delivers a talk on integrated nematode and soil health management in vegetable cropping systems.

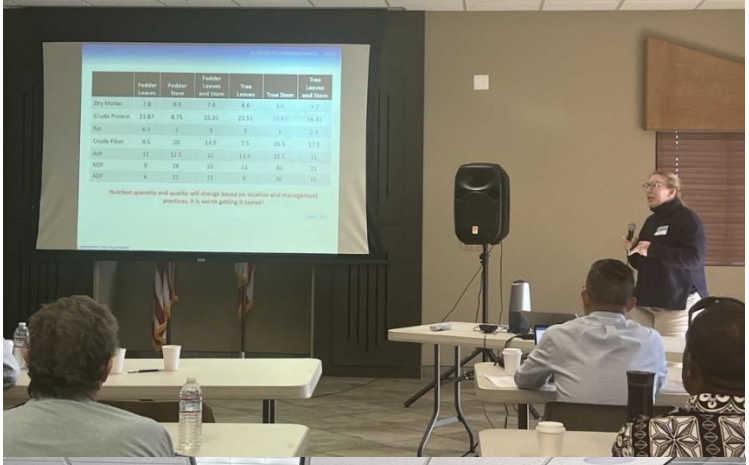


Benjamin Brock, Program Manager of IID On-Farm Efficiency Conservation Program, delivers updates on the IID water conservation program.

Ayman Mostafa, Area Programmatic Agent and Regional Specialist at the University of Arizona, delivers a talk on the impact and management aspects of sugarcane aphid (this talk was presented virtually).

Michael Rethwisch, UCCE Crop Production and Entomology Advisor, delivers a talk on Cowpea aphids in low desert alfalfa.

Oli Bachie, UCCE Agronomy & Weed Management Advisor, delivers a talk on Moringa, an emerging multi-purpose crop.



Brooke Latack, UCCE Livestock Advisor, delivers a talk on Moringa, an emerging multi-purpose crop.

Alex Putman, Assistant Plant Pathologist at UC Riverside, delivers an update on lettuce Fusarium wilt in California.

ALFALFA AND FERTILITY NEEDS

Michael D. Rethwisch, Field Crops Farm Advisor, UCCE Riverside County, Blythe Office

As most people who are involved with alfalfa know, prices in 2022 are higher now than a year ago. Hay prices reported from southeast California for the reporting week ending December 2 noted that large square bales ranged from $305-385/ton, with higher quality hay at the higher end of the range. Premium quality small squares were reported from $385-440/ton.

Using a modest $350/ton value, 10 lbs. of alfalfa hay = $ 1.75, and 100 lbs. of alfalfa hay = $17.50. It doesn't take much pest damage or nutrient shortages, lack of water, or other problems to create economic loss.

While many growers and PCAs are checking alfalfa for insects on a regular scale, similar diligence for fertility also is needed. Unlike controlling insects, when it comes to fertility, a pound of prevention is worth a pound of cure (or even more when one considers the potential missed hay production). Cures are usually noted after the fact, and often after deficiencies have occurred. Table 1 lists the most typical nutrient deficiencies for alfalfa in California and other arid/semi-arid areas.

Table 1. Nutrient deficiency symptoms and fertilizer rates for alfalfa in California and other arid and semi-arid regions.[1]

Nutrient	Deficiency Symptoms	Conditions Favoring Deficiency	Fertilizer Form	Maximum Nutrient Rate
Nitrogen	General yellowing especially of older leaves, a pinkish color may develop in the petiole or midrib	Poor nodulation	UAN32, urea	50 lbs. N/acre per cutting
Phosphorus	Leaves small and dark-green, underside purplish, leaflets may Fold	Cold soils, seedling alfalfa	11-52-0 10-34-0	100 lbs. P_2O_5/acre per year
Potassium	Small white spots on the outer edges of upper leaflets	Sandy soils	Potassium chloride or sulfate	300 lbs. K_2O/acre

Magnesium	Yellowing between veins on older leaves, leaf margins turn yellow, redden, and die.	High soil potassium or sodium, sandy soils, soils with low organic Matter	Dolomitic limestone, Epsom salt	Variable
Sulfur	Yellowing of new leaves, growth stunted, leaves become long and Slender	Sandy soils, soils with low organic Matter	Sulfur, gypsum	15 to 50 lbs. S/acre per year
Boron	Plant tops become yellow and reddish	Soil pH of 8.5, low organic matter soils	Borax, borosilicate, boric acid	1 to 3 lbs. B/acre
Molybdenum	General yellowing of older leaves followed by bleaching	Low pH, high iron	Ammonium or sodium molydate	0.1 to 0.5 lbs. Mo/acre

[1] Data table from Dr. Mike Ottman, (mottman@ag.arizona.edu), Former Extension Agronomist, University of Arizona, School of Plant Sciences IN Proceedings, 2010 California Alfalfa & Forage Symposium and Corn/Cereal Silage Mini-Symposium, Visalia, CA, 1-2 December, 2010.

Waiting until a crop loss/nutrient deficiency occurs is not the best management strategy. Many growers are aware that nutrient uptake and removal from fields in alfalfa hay varies by yield. Nitrogen is supplied by nodules on alfalfa roots, but data from Colorado indicates that the amounts produced are only slightly over 300 lbs./acre for these types of bacteria.

There is also nitrogen in the air, in rain water, and in the soil. Recent data for amount of nodule produced nitrogen in low desert alfalfa production systems does not seem to be readily available (longer growing season than other locations, but high temperatures in the summer can affect nodules), thus supplemental nitrogen fertilization may be necessary for many low desert alfalfa fields.

NUTRIENT	8 tons/acre	10 tons/acre	12 tons/acre
	Nutrient Removal, lbs./acre at differing yields/acre		
Nitrogen	480	600	720
Phosphorus	42 (95 P_2O_5)	52 (119 P_2O_5)	62 (143 P_2O_5)
Potassium	320 (384 K_2O)	400 (480 K_2O)	480 (576 K_2O)
Calcium	256	320	384
Magnesium	53	66	79
Sulfur	32	40	48
Iron	3.0	3.8	4.6
Manganese	2.0	2.5	3.0
Chlorine	2.0	2.5	3.0
Boron	0.5	0.6	0.7
Zinc	0.4	0.5	0.6
Copper	0.16	0.20	0.24
Molybdenum	0.032	0.04	0.048

Source: R.D. Meyer, D.B. Marcum, S.B. Orloff and J.L. Schmierer. 2007. Alfalfa Fertilizer Strategies. In C.G. Summers and D.H Putnam, eds. Irrigated Alfalfa Management for Mediterranean and Desert Zones. Chapter 6. University of California Agriculture and Natural Resources Publication 8292.

To monitor nutrient levels, many producers rely on soil and/or tissue tests to determine the level. Data indicates that tissue testing is more reliable than soil tests for this purpose.

Table 3. Relative reliability of soil and plant tissue testing for nutrient deficiency

Nutrient	Soil Testing	Tissue Testing
Phosphorus	Good	Excellent
Potassium	Good	Excellent
Sulfur	Very Poor	Excellent
Boron	Poor	Excellent
Molybdenum	Not Recommended	Excellent

Source: R.D. Meyer, D.B. Marcum, S.B. Orloff and J.L. Schmierer. 2007. Alfalfa Fertilizer Strategies. In C.G. Summers and D.H Putnam, eds. Irrigated Alfalfa Management for Mediterranean and Desert Zones. Chapter 6. University of California Agriculture and Natural Resources Publication 8292.

For phosphorus, potassium (K) and sulfur, the following table shows the various nutrient levels (deficient to high) based on mid-stem alfalfa samples.

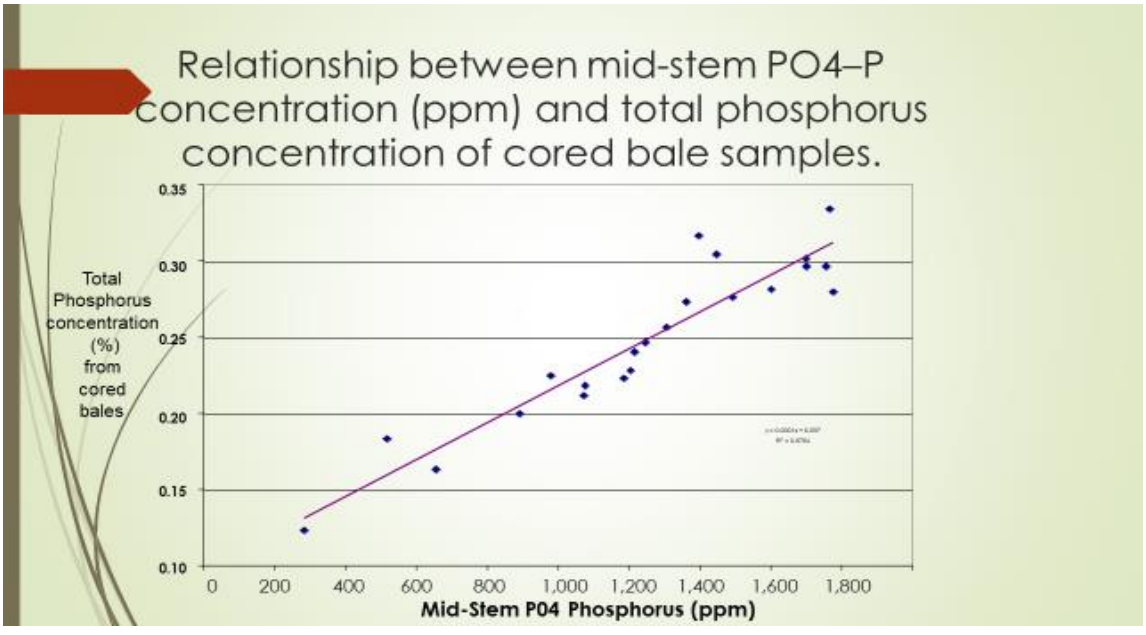
Table 4. Nutrient levels of Phosphorus, Potassium and Sulfur from alfalfa stem samples

	Mid Stems		Mid-stem Leaves
LEVEL	**PO_4-P** (ppm)	**K** (%)	**SO_4-S** (ppm)
Deficient	300 – 500	0.4 – 0.65	0 – 400
Marginal	500 – 800	0.65 – 0.80	400 – 800
Adequate	800 – 1,500	0.80 – 1.50	800 – 1,000
High	Over 1,500	>1.5	Over 1,000

Source: R.D. Meyer, D.B. Marcum, S.B. Orloff and J.L. Schmierer. 2007. Alfalfa Fertilizer Strategies. In C.G. Summers and D.H Putnam, eds. Irrigated Alfalfa Management for Mediterranean and Desert Zones. Chapter 6. University of California Agriculture and Natural Resources Publication 8292.

Some producers have expressed concern about tissue samples due to the relatively small number of stems collected/used for such sampling, especially when there are multiple soil types/variation in individual fields.

A research project conducted in northern California evaluated phosphorus concentration levels from cored samples of alfalfa hay bales (which represent a larger sample size) with that of PO_4 phosphorus in alfalfa mid-stems. The research results (shown in following figure) show that adequate PO_4 phosphorus levels in alfalfa mid-stems (800-1,500 ppm) to be correlated to approximately 0.19-0.26 percent phosphorus from cored alfalfa samples.



SOURCE: Maximizing fertilizer efficiency through tissue testing and improved application methods. S. Orloff, D. Putnam and R. Wilson. **In**: Proceedings, 2008 California Alfalfa & Forage Symposium and Western Alfalfa Seed Conference, San Diego, CA, 2-4 December 2008.

THE CORN LEAF APHID, *Rhopalosiphum maidis* (Fitch) IN THE LOW DESERT

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

Figure 1: SCA on volunteer sorghum (2016) and on sorghum trial field (2017) at DREC

Recently spotted corn leaf aphid (CLA) on Sudan grass fields of the Imperial Valley created some confusion with the more devastating aphis type, the sugarcane aphid, *Melanaphis sacchari* (Zehntner), as both aphids closely resembled each other, if not closely observed. Unlike the sugarcane aphid (SCA) (Figure 1) which is considered devastating to crops, but rarely observed, the corn leaf aphid is not considered as devastating. CLA is a C-rated pest in California, meaning it is widespread.

Figure 2: Sudan grass infested with CLA (photo: Jorge Celis)

After being alerted by the County Ag commissioners office (on the 2nd week of October 2022), UCCE dispatched its Ag technician to scout Sudan grass fields in the Imperial Valley. The technician detected aphid infestations on Sudan grass in growers' fields west of El Centro, NW of the Naval air base, North of Seeley, and NW of the Calipatria area and brough back some pictures (Figure 2). Despite a thorough visit to many farms, no more fields were detected with CLA, probably due to turning under Sudan grass fields after just one harvest for concerns of irrigation water (oral communication with farm managers).

A few weeks later, the aphid we sampled was identified as Corn Leaf Aphid (Imperial County Ag commissioner). Just like all other aphids, CLA sucks the sap of plants and deposits

a sticky substance, the honeydew (excrement) that may turn black as sooty mold grows on it. The mold may interfere with plant photosynthesis. CLA infested leaves may wilt or curl and show yellow patches of discoloration on corn. In addition to corn, CLA can also infest many cultivated grasses, including wheat, Sudan grass and many grass-type weeds. Aphids may also transmit viruses and cause crop damages through multiple agents.

UC IPM and visual observations in the field suggest that CLA is blue-green or gray looking, soft-bodied, spherical insect about the size of a pinhead in length (Figure 3). Sources also suggested that female CLAs do not lay eggs, as do most other insects, but give birth to living young (Figure 4). The newly born are called nymphs and resemble the adults except that they are smaller and sexually immature. Adults and nymphs can often be found clustered (Figure 4) within the whorls of corn. Most CLAs are wingless. However, as populations increase, some develop delicate, filmy wings, enabling them to fly to uninfested plants and start new colonies.

Figure 3: bluish appearing CLA adults

The UC IPM Guideline, states that several species of aphids may be found in corn, but corn leaf aphid and greenbug are the primary aphid species infesting corn in California. The UC IPM further states that CLAs are small to medium whereas the greenbug is a moderate-sized aphid.

Heavily CLA infested corn leaves may wilt, curl, and show yellow patches of discoloration (Figure 5). When honeydew produced by CLA covers tassels and silks (Figure 5), the pollination process can be disrupted, and incomplete kernels or barren ears develop.

Figure 3: infestation on corn leaf and tassel (internet source)

General management of aphids

The SCA is the most devastating aphid. Growers should monitor / scout sorghum & Sudan grass fields at least

weekly for SCA in order to minimize damges. Note that the population of SCA grows exponentially & builds very quickly. SCA can be easily identified by yellow color appearances & black spots on parts of their body. If it arrives and infestation occurs and the infestation is limited to field edges, consider destroying the infested edge. If plants throughout the field are covered with honeydew, consider early harvest. If suspicious, call the CE or Ag commissioner offices.

For CLAs, you may consider cultural control methods that may include **adequate irrigation and fertilization along with avoiding over fertilization** (helps plants tolerate moderate densities of corn leaf aphids). Other approaches may include prevention, such as keeping fields well-watered, attracting beneficial insects to the field, grow plants with natural pest-repelling properties around the field, and planting aphid trapping / attracting plants.

Most aphids can also be kept below economic levels with the use of biological Control / use of natural enemies: Aphids can be parasitized by small braconid parasitoid wasp, *Lysiphlebus testaceipes* and predated by lacewings, lady beetles, and syrphid flies (Figure 6).

The UC IPM lists the following materials for corn as effective pesticides to control CLAs (you would need confirm if the labels can also be used for other aphids or crops in the low desert). UC IPM also states that not all registered pesticides are listed.

- Dimethoate400, 0.66–1 pt
- Esfenvalerate (Asana XL), 5.8–9.6 fl oz
- Endosulfan (Thionex) 3EC, 1.33 qt
- Narrow range oils #, Label rates, 4

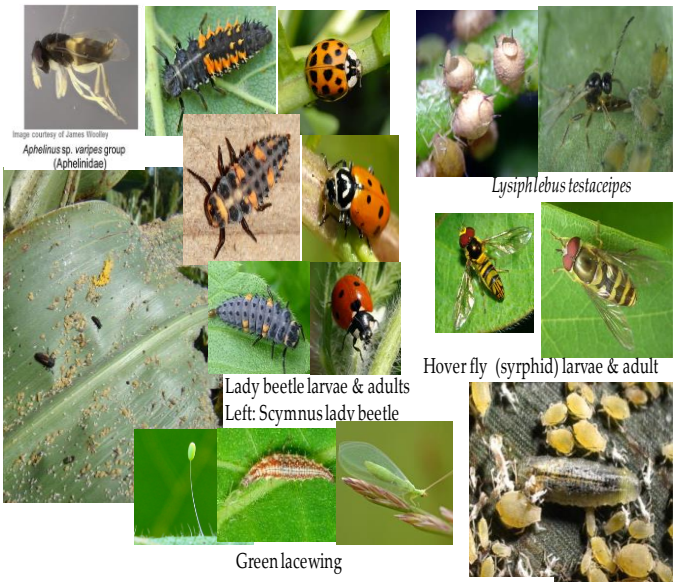


Figure 4: potential aphid biocontrol agents

Other management strategies recommended for aphids include rotating fields from host to non-host crops, control volunteer crop and host weeds, avoiding use of pesticides that are harmful to beneficial or natural parasites and predators.

The information in this article is extracted from references (see below), internet resources, and field assessments. If you have excessive aphid infestation or observe SCA in your farm, please contact our office (UCCE Imperial County) or the IC Ag Commissioner's office.

References

Bachie O. 2017. **The Sugarcane Aphid (SCA); A potential Devastating Pest of Low Desert Sorghum & Sudan grass.** Sorghum Crop Field Day and Workshop Presentation, UCCE Imperial County. Holtville, CA. October 3, 2017

Ortiz, Carlos. 2022. A brief on the current pests of concern in Imperial County. A presentation on the 33rd Fall Desert Crops Workshop hosted by UCCE Imperial County

Godfrey L.D. et al., *UC IPM Pest Management Guidelines:* UC ANR Publication 3443. http://ipm.ucanr.edu/PMG/pmgauthors.html?corn

Chandrasekhar K. et al., 2018. Exploring the metabolic variation between domesticated and wild tetraploid wheat genotypes in response to corn leaf aphid infestation. Plant Signal Behav

https://pubmed.ncbi.nlm.nih.gov/29944455/

NOVEMBER 2022 CATTLECAL NEWSLETTER UPDATE

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

The November edition of the CattleCal Newsletter covered information on research and activities completed this month, the career and research of Dan Macon, UCCE Livestock and Natural Resources Advisor and County Director, and a look at a research paper on carcass characteristics of beef x dairy crossbred cattle.

If you would like to subscribe to the CattleCal newsletter, please visit this site and enter your email address: http://ceimperial.ucanr.edu/news_359/CattleCal_483/

September CattleCal podcast episodes:

- **Career Call**
  In the career call of the month, Brooke Latack and Pedro Carvalho called Dan Macon, UCCE County Director and Livestock and Natural Resources Advisor based in Auburn, CA. In this episode Dan talked about his career, going from a short time in the industry to his job as a county advisor. He talked about learning from others, and at the end, Dan gave a brief overview of the Californian sheep industry.

- **Research Call**
  Brooke Latack and Pedro Carvalho call Dan Macon again to discuss research that he has conducted on the use of "Livestock Guardian Dogs".

- **Feedlot Research Call**
  In this episode, join Pedro Carvalho and Brooke Latack as they discuss a review paper looking at carcass characteristics of beef x dairy crossbred calves.

- **Quiz Zinn**
  In this episode, we asked Dr. Richard Zinn a question from our listeners about feed management strategies for periods of high heat.

The podcast can be found at https://open.spotify.com/show/6PR02gPnmTSHEgsv09ghjY?si=9uxSj3dYQueTEOr3ExTyjw or by searching "CattleCal podcast" in Spotify. It is free to listen!

If you have burning questions about cattle management and would like your questions featured on our Quiz Zinn episodes, please send questions to cattlecalucd@gmail.com or DM your question to our Instagram account @cattlecal.

If you have any questions or comments or would like to subscribe to the newsletter, please contact:

Brooke Latack (UCCE Livestock advisor) – bclatack@ucanr.edu
Pedro Carvalho (CE Feedlot Management Specialist) - pcarvalho@ucdavis.edu
CattleCal: cattlecalucd@gmail.com

Samples wanted for research on

Lettuce Fusarium wilt

WHAT we are looking for	Samples of lettuce plants affected by Fusarium wilt
WHERE we are looking	Imperial County (including Bard/ Winterhaven), Huron, Coastal California
WHY we are doing this	To monitor for emergence of new pathogen races
HOW you can help	If you are a grower or PCA and you have Fusarium wilt in your lettuce crop, contact us and we will survey your field and collect samples

Contact: Alex Putman, UC Riverside (951-522-9556, aiputman@ucr.edu)

Collaborators:
Jim Correll, Univ. of Arkansas
Stephanie Slinski, Yuma Center for Excellence in Desert Agriculture

Funded By:
California Leafy Greens Research Program
2022-2023

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 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.cim is.water.ca.gov. Estimates of the average daily ET_o for the period of November 1 to January 31 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	December		January		February	
	1-15	16-31	1-15	16-31	1-15	16-28
Calipatria	0.09	0.09	0.09	0.10	0.12	0.13
El Centro (Seeley)	0.10	0.09	0.10	0.11	0.13	0.15
Holtville (Meloland)	0.09	0.08	0.09	0.10	0.12	0.14

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/.