



*Imperial County*

*Agricultural Briefs*



**Features from your Advisors**

*September 2022 (Volume 25 Issue 8)*

**Table of Contents**

**UCCE IMPERIAL COUNTY GAVE A TALK AND HAD AN EXHIBIT AT THE “PESKY PESTS” EVENT.....Oli Bachie -129-**

**PIGWEEED PRESSURE INCREASES IN LOW DESERT ALFALFA .....Michael D. Rethwisch -131-**

**COMPARISON OF VARIOUS HERBICIDES USED WITH SHARPEN FOR CONTROL OF PIGWEEDS IN ALFALFA.....Michael D. Rethwisch -136-**

**ALFALFA LEAFTIER ACTIVE AGAIN IN LOW DESERT ALFALFA .....Michael D. Rethwisch & Apurba Barman -139-**

**ANNOUNCEMENT .....Apurba Barman -141-**

**WELCOME TO OUR NEW CLIMATE SMART SPECIALIST..... -142-**

**2023 FIELD CROP AND VEGETABLE CROP GUIDELINES ARE READY!!!..... -143-**

**JULY AND AUGUST 2022 CATTLECAL NEWSLETTER – UPDATE.....Brooke Latack -144-**

## Table of Contents (continued)

<b>MORINGA AWARENESS AND PRODUCTION WORKSHOP FLYER.....</b>	<b>-146-</b>
<b>IMPERIAL VALLEY CIMIS REPORT AND UC WATER MANAGEMENT RESOURCES .....Ali Montazar</b>	<b>-148-</b>

## UCCE IMPERIAL COUNTY GAVE A TALK AND HAD AN EXHIBIT AT THE “PESKY PESTS” EVENT

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

The annual “Pesky Pests” event was organized by the Imperial Valley Desert Museum and was held on August 27, 2022, at the Ocotillo, CA museum. The event included a tour of the museum, power point supported presentations and exhibits of major pests of quarantine and crop pests of the low desert.

Presenters were representatives from the United States Department of Agriculture (USDA), and the University of California Cooperative Extension (UCCE) Imperial County. While the USDA covered pests of concern to inspections at entry ports and processes of pest quarantine, UCCE Imperial County presented about crop pests of the low desert.

Oli Bachie, UCCE Imperial County, County Director and Agronomy and Weed Management advisor spoke about a broad range of crop pests that cause significant damage to crops in the low desert. He spoke of insect pests, pathogens, nematodes, weeds and vertebrate pests known to cause significant crop damages. While the subject area to cover all “crop pests” is diverse, Bachie provided highlights and summarizations only on major crop pests that cause significant damage to low desert crops. Bachie also covered recently discovered crop pests (insects, pathogens, and weeds), their potential damage to low desert crops and pesticide issues, including UCCE Imperial County’s role in conducting research and extension work to replace banned or soon to be banned pesticides.



Figure 1: Jorge Celis demonstrates collection of major low desert crop insect pests, photo courtesy: Mr. Jorge Celis, Sr.

Jorge Celis, UCCE Imperial County Ag technician provided various insect pest exhibits outside the meeting hall. Attendees to the event were growers, scientists, and the public. Various questions were asked and answers were provided.

We were informed that the Museum in Ocotillo is hosting this event as its 2nd annual Pesky Pests!! Event. The previous year event focused on local desert entomology, featuring scorpions, tarantulas, etc. This year, the museum extended to cover diverse pest, including pests of importance to the low desert crops and growers. I would like to thank Jorge for providing support and the exhibits of major insect pests during the event.

## PIGWEEED PRESSURE INCREASES IN LOW DESERT ALFALFA

*Michael D. Rethwisch, Crop Production and Entomology Farm Advisor, UCCE-Riverside County*

The summer of 2022 has had its share of moisture, hot and some below average temperature days, clouds, and wind. The moisture, while not necessarily welcomed by those producing hay crops when hay is curing, has been beneficial in increasing the amount of water in Lake Mead.

The rain and accompanying wet field conditions have also slowed harvest schedules and have allowed weeds to go to seed with the extra time allowing additional seed to mature. This is not a good thing, especially when we see fields full of pigweeds/Palmer Amaranth (Fig. 1).



*Fig. 1. Alfalfa field in low desert with weed pressure. This alfalfa field was removed from production, in part due to the intense weed pressure.*

## PIGWEEED SPECIES IDENTIFICATION

While there are several species of pigweeds in the low desert, Palmer amaranth is the one of most concern. This species has been documented to produce very high numbers of seeds per female plant, has developed resistance to glyphosate and other herbicides in multiple states, and is now found in low desert alfalfa fields in counties contiguous to the lower Colorado River.

Palmer amaranth is an annual plant native to the arid southwestern United States and northwestern Mexico. It is a traditional food of several indigenous peoples. Its life-cycle is adapted to desert conditions; it will germinate and grow quickly. Some states currently have regulations against bringing Palmer amaranth seed or plant parts into their state.



*Fig. 2. Palmer amaranth in the Palo Verde Valley. Leaves have long petioles, prominent veins from the mid-rib, and often have a whitish chevron shaped area on the diamond shaped leaves. Some people have commented that the leaf arrangement reminds them of poinsettia.*

Palmer amaranth looks a bit different than other pigweeds, with a key characteristic being that the leaf petiole is longer than the leaf. This is noted in the following pigweed identification table that was created by Dr. Lynn Sosnoskie, a former UCCE agronomy and weed science advisor in Madera and Merced Counties

### Some characteristics for distinguishing among some commonly occurring pigweed species

Species	Leaf blades	Petiole length	Stem	Reproduction	Sharp bracts with flowers	Primary location of flowers
Redroot pigweed	hairy with prominent veins	shorter than leaf blade	hairy	male and female flowers on <u>same</u> plant	no	terminal spike
Prostrate pigweed	spoon-shaped, dark green	shorter than leaf blade	smooth succulent red	male and female flowers on <u>same</u> plant	no	leaf axils
Tumble pigweed	Light green, oval, wavy edges	shorter than leaf blade	smooth	male and female flowers on <u>same</u> plant	yes	leaf axils
Waterhemp	long, narrow, oval, dark green	shorter than leaf blade	smooth green or red	male and female flowers on <u>different</u> plants	no	terminal spike
Palmer amaranth	diamond-shaped, may have a chevron	longer than leaf blade	smooth green or red	male and female flowers on <u>different</u> plants	yes (females)	terminal spike

#### Palmer Amaranth is of concern to low desert alfalfa growers for multiple reasons:

- 1) Pigweed stems, being much thicker than alfalfa stems, slows down hay curing and increases chances of stack fires if not cured properly. The increase in curing time can also result in fewer harvests over an extended period as the cutting/harvesting cycles are lengthened.
- 2) Weedy alfalfa is not as desired by buyers compared to pure alfalfa
- 3) Palmer amaranth competes aggressively with crops. It has a fast growth rate of 2- 3 inches per day and commonly reaches heights of 6- 8 feet, greatly inhibiting crop growth.
- 4) Pigweeds utilize water for their growth.
- 5) Cutting the plants when harvesting alfalfa is not a highly effective control measure, as Palmer amaranth plants are usually not killed by mowing. They can regrow from cut stalks and set seed close to the ground.

6) High levels/prolific seed production. In Iowa, a single waterhemp plant was documented to produce over 2 million seeds. Researchers in Missouri reported no difference in number of seeds produced by individual waterhemp and Palmer amaranth plants. Reported average seed production per female Palmer amaranth plant is 400,000-1,000,000 seeds.

Palmer amaranth seeds can remain viable for several years. Those closest to the surface declined in viability faster than those deeper in the soil in a Georgia study. Low desert summer soil temperatures will be higher than those of Georgia however, and results may differ.

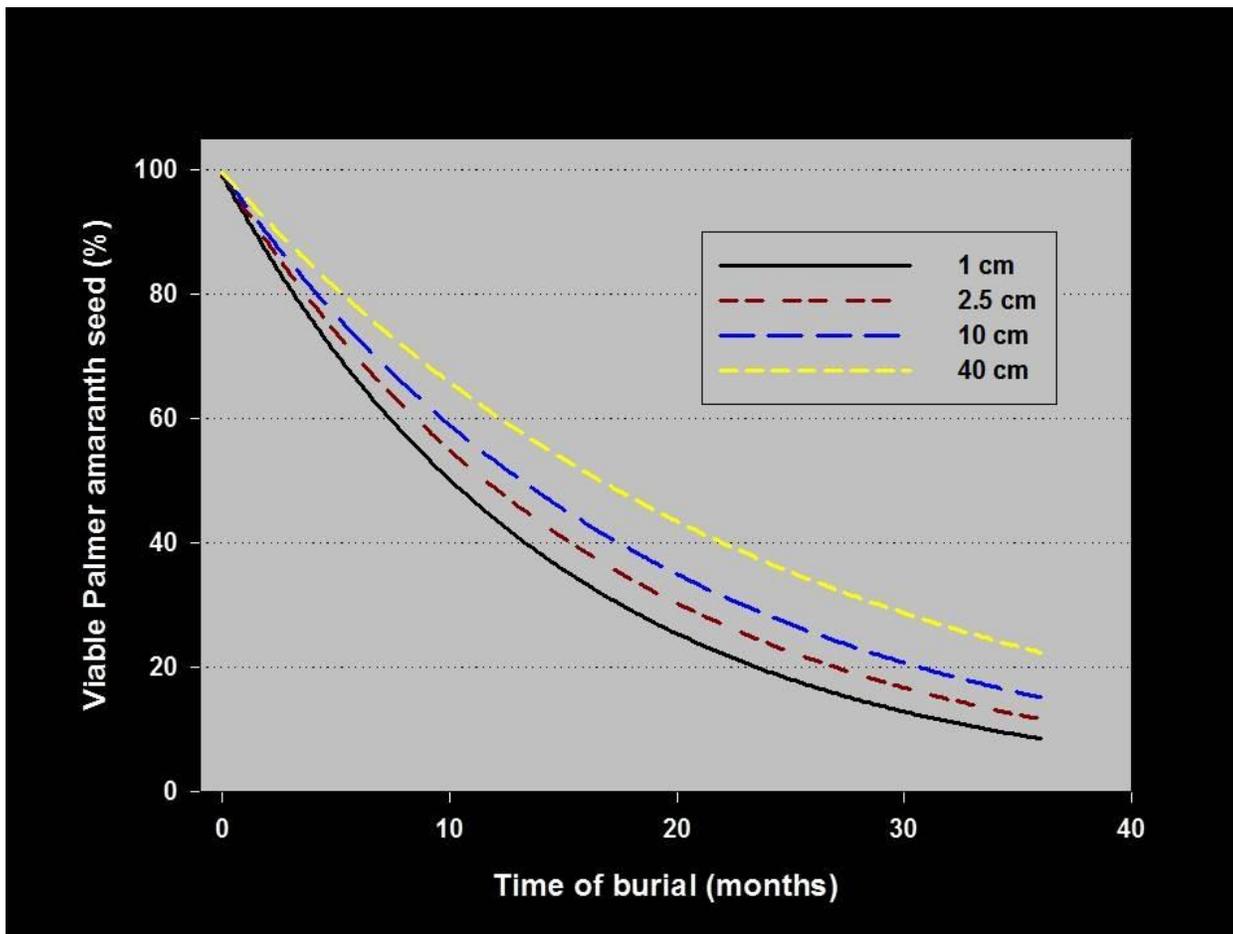


Fig. 3. Effects of seed burial depth and length of burial on Palmer amaranth seed viability. Sosnoskie, L.M., T.M. Webster and A.S. Culpepper. 2013. Glyphosate resistance does not affect Palmer amaranth (*Amaranthus palmeri*) seedbank longevity. *Weed Science*. 61:283-288

While swathing an alfalfa field generally does not kill Palmer amaranth plants, it can reduce subsequent seed production. A study of cutting heights (ground level, 1 inch, 6 inches and not cut at all) was conducted in the San Joachin Valley in cotton for the effects on seed production. Seed production per female plant in alfalfa in the low desert will probably be greater due to less competitive shading in comparison with cotton.

<b>Cutting Height</b>	<b>Mean number of seeds produced per female plant</b>
Ground level (0 inches)	700
1 inch above soil line	35,000
6 inches above soil line	100,000
Un-cut Palmer Amaranth plants	400,000

### **Take Home Suggestions for Reducing Palmer Amaranth and other Pigweed Problems in Alfalfa**

- 1) Keep Palmer amaranth from germinating in your fields (an ounce of prevention is worth a pound of cure). This is expected to necessitate multiple pre-emergent herbicide applications during the summer, possible one each cutting.
- 2) Clean off swathers (and other field equipment as applicable) after it leaves field that has a Palmer amaranth infestation to prevent movement of seed from field to field
- 3) Keep seeds in your fields (don't move water from a field that has Palmer amaranth to a canal or another field as seeds are known to move with water)

## COMPARISON OF VARIOUS HERBICIDES USED WITH SHARPEN FOR CONTROL OF PIGWEEDS IN ALFALFA

*Michael D. Rethwisch, Crop Production and Entomology Farm Advisor, UCCE-Riverside County*

A post emergent herbicide trial directed towards pigweed control was initiated on October 6, 2021, using primarily combinations of a burn-down herbicide (Sharpen) plus a second herbicide chemistry against established pigweeds in a bedded alfalfa field. This field trial evaluated herbicide effects on both pigweeds and other germinating weeds such as annual sowthistle, and documented damage/reduction in alfalfa foliage heights.

Herbicides used in addition to Sharpen<sup>®</sup> were Raptor, Pursuit, Chateau SW, Warrant and Zidua SC. With the exception of Warrant (registered for usage in Arizona on alfalfa) and Zidua SC (not yet registered on alfalfa in the US), all other herbicides were labeled for usage in alfalfa, with most herbicides evaluated at 2 rates (*rates are shown in data table*). Treatments were applied with a backpack sprayer calibrated to deliver 20.4 gpa.

These treatments resulted in various levels of phototoxicity of alfalfa, which was expected, as Sharpen<sup>®</sup> is considered a burn-down herbicide that is effective against broadleaf plants. Differences between products in burn-down was easily noted at several days post application (Fig. 1). Treatments which resulted in best efficacy of pigweeds also results in highest level of damage to alfalfa.



*Fig. 1. Variation in alfalfa phytotoxicity was noted several days after application of Sharpen<sup>®</sup> herbicide when applied in combination with other herbicides at 2 different rates.*

Data on October 20 (14 days post treatment) noted that shortest alfalfa was associated with the treatment that consisted of 4 oz./acre of Sharpen<sup>®</sup> in combination with 1 qt/acre of Warrant and 1 oz./acre of Chateau SW, with alfalfa being almost 5.5 inches shorter than untreated alfalfa on this date. This herbicide combination treatment also resulted in the fewest percent of pigweeds that no longer had any green structures (97.5), and the fewest number of seedling annual sowthistles (1.0 per meter of furrow + bed). Untreated alfalfa averaged 73.7 sowthistle seedlings for this unit area but only 7.4\$ of pigweeds with no green structures (thought dead due to mechanical injury from previous machinery passes in the field).

These data also indicate that waiting until early October for pre-emergent herbicide applications for sowthistle control is probably too late as some had already begun the germination process based on the differences between untreated, Sharpen<sup>®</sup> only, and Sharpen<sup>®</sup> + pre-emergent herbicides. Rate effects for the various herbicides was also noted when sowthistle seedling data were collected, with fewer seedlings usually noted with the higher rate of product used.

It should also be noted that regrowth alfalfa after most of the herbicide applications often had much larger leaves than untreated alfalfa. The value of these larger leaves was not quantified as yield and quality data from the plots was not obtained.

Effects of various herbicides applied to alfalfa on October 6, 2021, Blythe, California

Herbicide and Rate/Acre	Water Conditioner and Rate	Surfactant and Rate	% Pigweed plants with no green structures	Green tissue and structures level (1= low, 4 =high)	Mean number of annual sowthistle seedlings/ meter (furrow + bed)	Mean Alfalfa Height (inches) on October 20, 2021
Chateau SW 1 oz. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	90.0 ab	2.7 bc	17.3 bcd	8.6 bc
Chateau SW 2 oz. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	81.3 a-e	2.6 b	5.8 d	7.6 cd
Prowl H20 2 qt. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	72.0 cde	2.0 bcd	13.6 bcd	7.7 cd
Prowl H20 4 qt. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	68.8 de	1.6 d	5.1 d	7.7 cd
Pursuit 3 oz. + Raptor 3 oz. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	71.3 cde	2.0 bcd	17.9 bcd	8.0 cd
Pursuit 6 oz. + Raptor 6 oz. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	84.2 abc	2.1 bcd	10.9 bcd	7.9 cd
Sharpen 2 oz.	K-Amino 1 lb./acre	----	75.0 b-e	2.1 bcd	29.8 b	9.3 b
Sharpen 2 oz.	K-Amino 1 lb./acre	Methylated Seed Oil (1% v/v)	83.8 a-d	1.8 cd	24.8 bcd	8.3 cd
Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	67.5 e	2.3 bcd	25.9 bc	8.0 cd
Warrant 1 qt. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	85.0 abc	1.5 d	13.3 bcd	8.1 cd
Warrant 2 qt. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	81.3 a-e	1.75 cd	6.1 cd	7.8 cd
Warrant 1 qt. + Chateau SW 1 oz. + Sharpen 4 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)	97.5 a	2.0 bcd	1.0 d	7.2 d
Zidua SC 3.25 oz. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)			11.8 bcd	7.8 cd
Zidua SC 6.5 oz. + Sharpen 2 oz.	Quest (0.5% v/v)	Methylated Seed Oil (1% v/v)			10.1 bcd	7.2 d
Untreated	----	----	7.4 f	4.0 a	73.7 a	12.8 a

## ALFALFA LEFTIER ACTIVE AGAIN IN LOW DESERT ALFALFA

*Michael D. Rethwisch, Crop Production and Entomology Farm Advisor, UCCE-Riverside County  
Apurba Barman, Department of Entomology, University of Georgia*

The alfalfa leaftier (Fig. 1) was a new U.S. alfalfa pest that was noted damaging alfalfa in both Imperial and Yuma Counties during the fall of 2021. Caterpillars were later collected from alfalfa in La Paz and Riverside Counties, but damage was not noted with these collections.

During the summer of 2022 alfalfa leaftier caterpillars had not been collected from Palo Verde Valley alfalfa in Riverside County until the week of September 4, when a pest control advisor (PCA) found multiple caterpillars and associated feeding damage. This initial discovery indicates that PCAs and producers should be watching low desert alfalfa closely for additional infestations for this insect, based on the timing of infestations noted in 2021.



**Figure. 1. Alfalfa leaftier caterpillar. Note the dark sclerotized head and first thoracic segment which helps to identify this insect in addition to 5 pairs of prolegs** (Photo by John Palumbo, University of Arizona)

As this was a new alfalfa pest for U.S. alfalfa in 2021, there are more questions than solid answers at this time. For example, economic thresholds have not been established as additional data on damage (Fig. 2) and effects on alfalfa yield and quality need to be quantified. The role of beneficial insects for control of this pest when found in low desert alfalfa has not yet been fully documented.



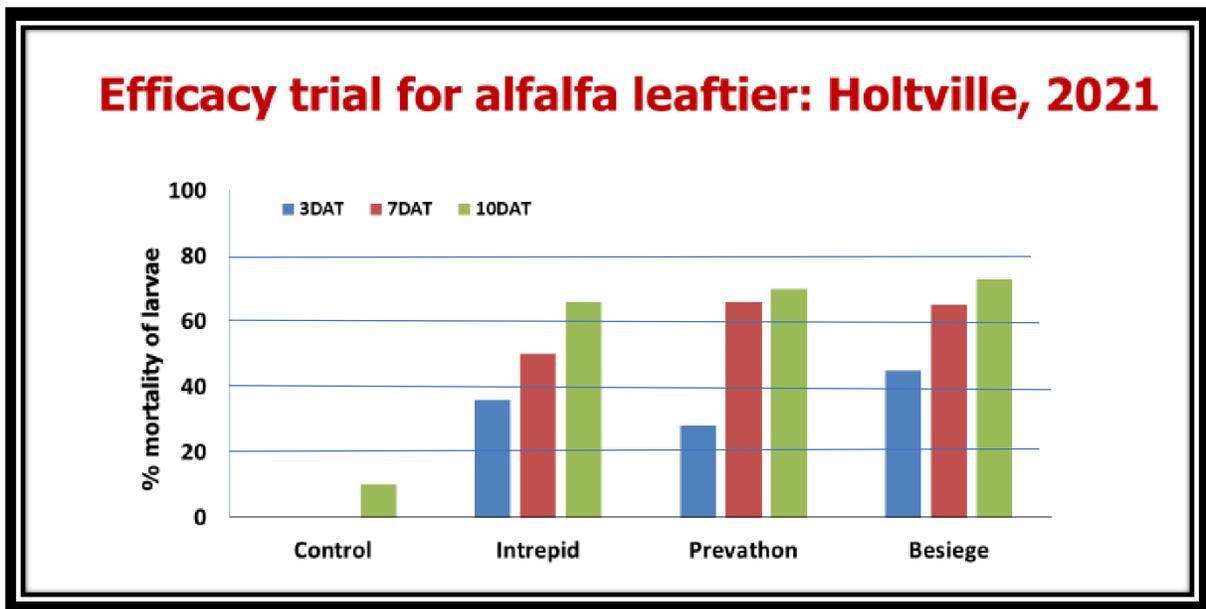
**Fig. 2. Feeding damage from alfalfa leaftier caterpillars. They get their name from tying alfalfa leaflets together, and feeding within this protected area.** (Photos by Apurba Barman, UCCE-Imperial County).

Very few insecticide efficacy data exist for this pest, with the only U.S. data being obtained in 2021 from an initial unreplicated insecticide comparison in Imperial County. In this trial insecticide solutions were applied at 17.0 gpa, and included the surfactant DyneAmic at 0.25% v/v. Three registered alfalfa insecticides were used at top of label rates/acre.

Intrepid® 2F (active ingredient = methoxyfenozide): 10.0 oz.

Prevathon® (active ingredient = chlorantraniliprole): 20.0 oz.

Besiege® (active ingredients = lambda-cyhalothrin and chlorantraniliprole): 10.0 oz.



## ANNOUNCEMENT

It is with a heavy heart that I share I am no longer with the Imperial County Cooperative Extension since I accepted a faculty position with the Department of Entomology, at the University of Georgia last month. It was an honor and a great learning experience for me to work as an IPM Advisor for the Low Desert of California. While I am leaving this place, I am carrying with me my friendship with my clientele, and the experiences gained during my stay in this position. I am always available if you want to contact me at my new e-mail address ([abarman@uga.edu](mailto:abarman@uga.edu)) and/or my cell phone number (209) 285-9810.

Thank you so much!

Apurba Barman

## WELCOME TO OUR NEW CLIMATE SMART SPECIALIST



Ana Resendiz is the new Community Education Specialist for the Climate Smart Agriculture program. She provides technical assistance to farmers and ranchers who are interested in applying for the three California Department of Food and Agriculture Climate-Smart Agriculture initiatives grant funding opportunities including:

- The Alternative Manure Management Program (AMMP)
- The State Water Efficiency and Enhancement Program (SWEEP)
- The Healthy Soils Program (HSP)

She has always been concerned with solving environmental problems using sustainable technologies and practices, which motivated her to obtain her B.S. in Bioengineering in her home country, Mexico. She developed an interest in agricultural systems and earned her M.S., focusing on crops of agricultural interest from a biotechnological perspective. She earned an AA in Plant Sciences from Imperial Valley College while assisting in different research projects at UCCE Imperial County. She has been a Science teacher for youth and adults since teaching is one of her passions, and now she is excited to work at UCCE and assist local farmers and ranchers applying new practices to take care of the environment and resources.

Ana Resendiz

[aresendiz@ucdavis.edu](mailto:aresendiz@ucdavis.edu)

(442) 265-7700

# 2023 Field and Vegetable Crops Guidelines

**Cost: \$40.00 for each**

**Available for purchase**

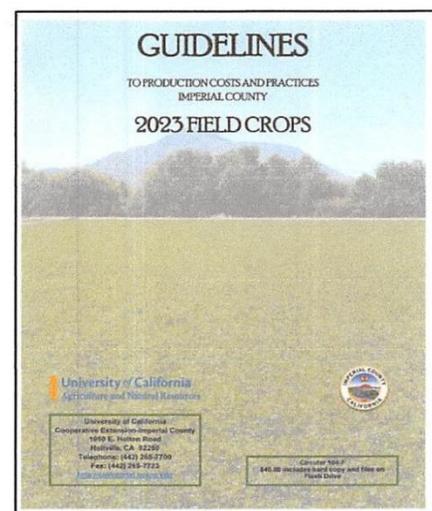
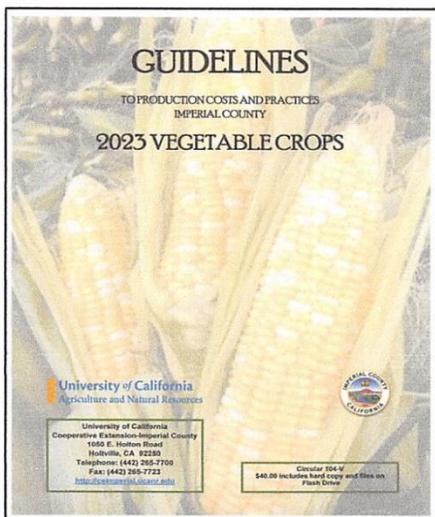
**Either by Cash or Check only.**

**Please bring exact cash.**

**If paying by Check, make Check out to.....**

**Imperial County Cooperative Extension**

**Credit Card purchases are not available.**



## **JULY AND AUGUST 2022 CATTLECAL NEWSLETTER - UPDATE**

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

The July edition of the CattleCal Newsletter covered information on methods of including fat in a feedlot diet and concerns regarding removing fat from the diet, the career and research of Jeff Clark, sales associate for C-Lock Inc., and a look at a review paper on fat in the feedlot diet

The August edition of the CattleCal newsletter covered information on shade structures for cattle production, the career and research of UC Davis professor Richard Zinn, and a look at a study supplementing methionine and lysine in the diet of calf-fed Holsteins early in the feedlot.

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/](http://ceimperial.ucanr.edu/news_359/CattleCal_483/)

### **July CattleCal podcast episodes:**

#### **- Career Call**

In the career call of the month, Brooke Latack and Pedro Carvalho called Jeff Clark, sales associate for C-Lock Inc. to talk about his journey Cal Poly (SLO) to managing livestock to sales positions outside the ag industry to a position in sales related to livestock sustainability. Listen as Jeff talks us through his incredible experiences that got him to where he is now.

#### **- Research Call**

Brooke Latack and Pedro Carvalho call Jeff Clark about the important research and data being generated by products from C-Lock Inc. and where Jeff sees sustainability going for the agriculture industry.

#### **- Feedlot Research Call**

In this episode, join Pedro Carvalho and Brooke Latack as they discuss a study looking at a review of fat supplementation in feedlot diets.

#### **- Quiz Zinn**

In this episode, we asked Dr. Richard Zinn a question from our listeners about methods for mixing fat into the diet and issues related to removing fat from a feedlot diet.

## **August CattleCal podcast episodes:**

### **- Career Call**

We had the pleasure to talk with Dr. Jerad Jaborek, Beef Feedlot Systems Educator for Michigan State University Extension. Jerad discusses his journey from working with dairy to beef, his work with a small animal processing facility, and his pursuit of his PhD studying crossbred Jersey cattle.

### **- Research Call**

Brooke Latack and Pedro Carvalho call Dr. Jerad Jaborek again to further discuss his research related to Jersey crossbred steers and the benefits of adding Wagyu into a crossbreeding system.

### **- Feedlot Research Call**

In this episode, join Pedro Carvalho and Brooke Latack as they discuss a review paper looking at beef x dairy crossbred cattle and considerations to make those cattle profitable.

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](mailto: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](mailto:bclatack@ucanr.edu)

Pedro Carvalho (CE Feedlot Management Specialist) - [pcarvalho@ucdavis.edu](mailto:pcarvalho@ucdavis.edu)

CattleCal: [cattlecalucd@gmail.com](mailto:cattlecalucd@gmail.com)



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Agriculture and Natural Resources | Cooperative Extension

## Moringa Awareness and Production Workshop

Join UC Cooperative Extension for a *FREE* workshop

**Thursday, October 13, 2022**

**9:00 – 11:00 AM**

**UCCE Cooperative Extension**

**1050 E Holton Rd**

**Holtville, CA 92250**

### Topics Include:

- Moringa production potential in the low desert
- Moringa for human consumption
- Moringa nutrition for livestock
- Group discussion of moringa production – things that are working well, concerns, knowledge gaps, potential research

### Who should attend:

- Anyone currently producing or interested in producing moringa, particularly as a livestock feed.
- Livestock operators interested in feeding moringa.
- Consultants and allied industry professionals.



PC: C Waterman, 2020

Register at: <http://ucanr.edu/desertmoringa>

*For more information contact Brooke at (442) 265-7712 or [bclatack@ucanr.edu](mailto:bclatack@ucanr.edu).*

It is the policy of the University of California (UC) and the UC Division of Agriculture & Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities (Complete nondiscrimination policy statement can be found at <http://ucanr.edu/sites/anrstaff/files/215244.pdf>). Inquiries regarding ANR's nondiscrimination policies may be directed to John I. Sims, Affirmative Action Compliance Officer/Title IX Officer, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1397.



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## Moringa Awareness and Production Workshop

Thursday, October 13, 2022

9:00 – 11:00 AM

- 9:00 – 9:05**      **Welcome**  
*Brooke Latack, UCCE Imperial, Riverside, and San Bernardino Counties*
- 9:05 – 9:20**      **Production potential of Moringa in the Low Desert**  
*Dr. Oli Bachie, UCCE Imperial, Riverside, and San Diego Counties*  
Learn about the production potential for Moringa in the low desert area.
- 9:20 – 10:00**      **Moringa for Human Consumption**  
*Dr. Carrie Waterman, Assistant Professional Researcher, Institute for Global Nutrition, UC Davis*  
Learn about the history, uses, and benefits of Moringa as well as the cultivation, consumption, processing, and preservation for human consumption. This training is supported by a CDFA specialty crop grant.
- 10:00 – 10:15**      **Nutritional Impact of the Feeding of Moringa to Livestock**  
*Brooke Latack, UCCE Imperial, Riverside, and San Bernardino Counties*  
Learn about the nutritional qualities of moringa for livestock compared to other commonly fed forage crops as well as potential issues and benefits of feeding moringa to livestock.
- 10:15 – 11:00**      **Discussion**  
*All participants*  
This is a chance for all participants to discuss what has been working, challenges in production, knowledge gaps, and potential research that would help local producers. We welcome all participants to bring questions and comments that will help us move forward as we continue to develop moringa as a functional crop for Southern California both for human and livestock consumption.

## IMPERIAL VALLEY CIMIS REPORT AND UC WATER MANAGEMENT RESOURCES

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

The reference evapotranspiration ( $ET_0$ ) 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  $ET_0$  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  $ET_0$  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 ( $ET_0$ ) 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/>.

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(Complete nondiscrimination policy statement can be found at <http://ucanr.org/sites/anrstaff/files/107734.doc>)*

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