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Imperial County Agricultural Briefs

October 2024 (Volume 27 Issue 9)

Features from your Advisors

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EVALUATION OF OKRA CULTIVARS FOR PRODUCTION IN IMPERIAL COUNTY, CA.

Jairo Diaz and Gilberto Magallon – Desert Research and Extension Center

Key Takeaways

- **Cultivar Selection**: Cultivar choice significantly impacts yield and pod production. "F96-1007" emerges as a high-performing cultivar in terms of both yield and pod numbers.
- **Yield Efficiency**: While some cultivars like "Clemson Spineless" excel in yield per pod, others such as "F104-1368" and "F93-808" may need further evaluation or adjustment to optimize their productivity.
- **Cumulative Yields**: Varieties Lucky G, Carmine S, and F96-1007 demonstrated consistent high performance in cumulative yields, suggesting their potential suitability for continued cultivation in the region.

Introduction

The University of California Desert Research and Extension Center (UC DREC) evaluated okra (*Abelmoschus esculentus*) cultivars to assess their performance in the low desert region of California.

Material and Methods

There were 16 okra cultivars tested for suitability in desert conditions in the 2023 trial. Field studies were performed at the UC DREC located in Holtville, CA. The trial evaluated all okra cultivars in twin rows on 101.6-cm beds by 4.6-m-long plots (Figure 1). Four replicates of each cultivar were grown. The top 30-cm soil has a loam textural classification, a pH of 7.9, a cation exchange capacity of 20.0 meq 100 g^{-1} and soil electrical conductivity of 3.9 dS m^{-1} (Table 1). Okra cultivars were direct seeded on February 27th, 2023. Trial followed similar cultural practices (irrigation, fertilization, weed and pest control) adopted by commercial growers in the region. Cultivars were fertilized with 448 kg ha^{-1} of 11-52-00 (NPK) at planting. In addition, 224 kg ha^{-1} of urea were applied on April 5th and July 21st, 2023; and 96 l ha^{-1} of UAN32 were applied on May 1st, 2023. Sprinkler irrigation was used for germination and establishment. Furrow irrigation was performed after crop establishment. Weed control was maintained by hand weeding during the growing season. Pest management practices included the application of Admire (0.16 l ha^{-1}) on March 29th, and April 7th, 2023. Pods were harvested from five plants by variety. Harvest was scheduled when pods reached commercial sizes (7.6-12.7 cm). The experimental design of this trial was a randomized complete block design with four replications. Statistical analysis was conducted using the Statistical Analysis Software, SAS.

Figure 1. Field trial view.

Table 1. Soil fertility characterization (0-30 cm) of testing plots at DREC before planting.[z]

pH	NO_3-N (ppm)	PO_4-P (ppm)	K (ppm)	CEC (meq g^{-1})	ECE (dS m^{-1})	Ca (ppm)	Mg (ppm)	Na (ppm)	ESP
7.9	110.4	20.5	210	20.0	3.9	3,986	567	240	3.1

[z]NO_3-N = nitrate nitrogen, PO_4-P = orthophosphate phosphorus (Olsen method), K= potassium, CEC = cation exchange capacity, Ca = calcium, Mg = magnesium, Na = sodium, ESP = exchangeable sodium percentage.

Results and Discussion

We collected information about number of pods and yield from 14 harvest dates (Table2). During the first harvest we also measured pod diameter and mucilage thickness (Table 3).

Table 2. Yields (grs) from five plants by date (m/dd) and variety in 2023.

VARIETY	5/18	5/25	6/01	6/07	6/15	6/20	6/23	6/26	6/29	7/07	7/11	7/17	7/24	8/02
JAMBALAYA	35	166	182	172	299	234	173	115	196	472	135	153	106	61
CLEMSON S	46	100	214	243	464	326	117	104	102	369	164	382	160	92
LUCKY G	19	213	275	277	457	418	217	169	231	649	418	256	82	97
GREENIE	36	179	240	228	364	247	90	130	167	451	137	121	53	5
F93-832	39	213	259	290	387	297	115	140	120	451	162	192	31	50
F101-1206	73	189	223	238	292	279	109	171	218	440	177	112	119	191
LIV	95	232	206	189	308	268	105	120	144	579	198	143	122	86
F101-1232	120	171	191	250	413	240	175	157	165	282	97	135	156	112
F93-834	54	199	271	236	354	269	97	165	160	533	162	185	41	53
F104-1368	125	211	241	230	333	347	132	158	213	446	118	239	183	163
F103-1339	78	179	253	211	362	329	102	146	139	457	187	290	118	109
F104-1358	107	230	242	228	435	306	143	146	166	344	123	179	130	108
F105-1395	151	227	264	191	390	247	145	193	162	502	192	111	83	140
CARMINE S	57	198	201	255	460	380	141	194	298	655	195	198	111	94
F96-1007	73	148	251	258	481	421	160	212	239	676	207	342	139	245
F93-808	68	229	255	231	364	255	109	196	182	617	166	94	34	79

Table 3. Data collected by variety during first harvest (May 18th, 2023).

Variety	Pods	Yield (Grs)	Length (Mm)	Diameter (Mm)	Mucilage Thickness (Mm)
Jambalaya	9	105	64	13	1.3
Clemson Spineless	9	139	72	15	1.3
Lucky Green	4	56	69	16	1.7
Greenie	9	109	64	14	1.3
F93-832	6	78	47	9	0.8
F101-1206	22	293	105	17	1.6
Liv	26	378	113	18	1.7
F101-1232	32	479	101	19	1.8
F93-834	17	217	98	17	1.9
F104-1368	30	498	111	19	1.5
F103-1339	23	313	100	18	1.8
F104-1358	27	428	106	19	2.0
F105-1395	33	604	103	20	2.0
Carmine Splendor	16	227	85	19	2.1
F96-1007	21	290	100	19	2.3
F93-808	21	272	107	17	1.8

Cultivar “F96-1007” had the highest yield and number of pods (Table 4). Cultivar “Greenie” had the lowest yield and number of pods. Cultivar “Clemson Spineless” had the highest yield by pod. Cultivars “F104-1368” and “F93-808” had the lowest yield by pod.

Table 4. Average values by variety (results from five plants per variety).[z]

Variety	Pods	Yield (Grs)	Yield By Pod
Jambalaya	126 bc	2,488.8 bc	19.8 cd
Clemson Spineless	102 c	2,868.3 bac	28.2 a
Lucky Green	158 ba	3,769.8 ba	23.4 b
Greenie	102 c	2,437.5 c	23.6 b
F93-832	132 bc	2,725.5 bac	20.7 cbd
F101-1206	143 bc	2,830.8 bac	19.7 cd
Liv	139 bc	2,791.8 bac	19.9 cd
F101-1232	134 bc	2,663.3 bac	19.7 cd
F93-834	131 bc	2,776.5 bac	21.3 cbd
F104-1368	164 ba	3,136.3 bac	18.9 d
F103-1339	144 bc	2,960.0 bac	20.5 cbd
F104-1358	142 bc	2,886.0 bac	20.1 cd
F105-1395	132 bc	2,994.3 bac	22.4 cb
Carmine Splendor	144 bc	3,434.3 bac	23.8 b
F96-1007	198 a	3,850.0 a	19.3 cd
F93-808	154 b	2,877.3 bac	18.7 d

[z]Means in a column followed by the same letter are not significantly different at $P \leq 0.05$ according to the Duncan's multiple range test.

After June 15, 2023 harvest, cumulative yields from Lucky G, Carmine S, and F96-1007 varieties were consistently higher than the remainder of tested varieties (Figure 2).

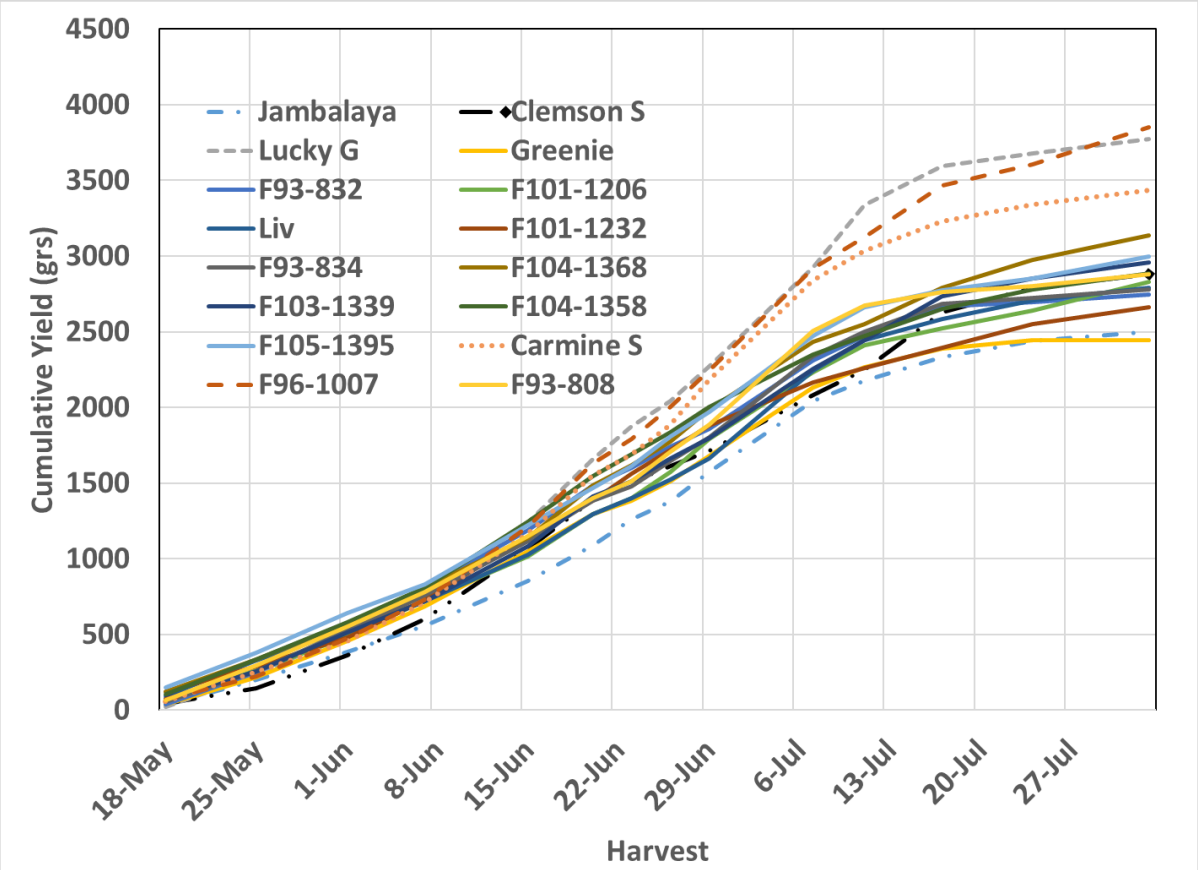

Figure 2. Cumulative yields by variety and harvest time (results from five plants per variety).

Acknowledgments

Thanks to UC DREC staff for supporting field operations and data collection for this project. Dr. Roberto Soto, Universidad Autónoma de Baja California, performed statistical analysis in SAS. Funds were provided by Known-You Seed America Corporation through research agreement No. Y23-6341. For trial/sales inquiry, please contact Jason Boonkokua at 661-855-3192 or jboonkokua@knownyou.com.

Okra Pictures

Jambalaya		
Clemson Spineless		
Lucky Green		
Greenie		
F93-832		
F101-1206		

Liv		
F101-1232		
F93-834		
F104-1368		
F103-1339		
F104-1358		

F105-1395

Carmine Splendor

F96-1007

F93-808

LETTER TO PCAs

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

Dear Imperial County PCAs,

As some of you may already know, Arun Babu (new Entomology Advisor) and I (new Plant Pathology Advisor) are eager to connect and strengthen our collaboration with you. Our main objective is to gain a deeper understanding of the key pest and disease challenges in the valley, allowing us to provide more focused research, insights, and access to new technologies.

We believe these meetings will also help keep everyone informed. If someone identifies an issue early, it can benefit the entire community. We're happy to maintain anonymity if needed, but sharing information will help alert others and foster collective awareness—after all, insects and pathogens don't respect field boundaries.

For our initial meetings, we propose the following dates:

- Wednesday, Nov. 20th, 2:00-3:00 pm
- Wednesday, Dec. 18th, 2:00-3:00 pm

Both meetings will be held at our UCCE Imperial office (1050 East Holton Road, Holtville, 92250, CA). We will aim to offer 0.5 CEUs for each session.

Thank you, and we look forward to seeing you and working together!

Arun and Ana

UNIVERSITY OF CALIFORNIA
COOPERATIVE EXTENSION

Riverside County Agriculture & Natural Resources

290 N. Broadway, Blythe CA 92225
760-921-5060 (Office), 760-921-5059 (Fax)

Michael Rethwisch, UCCE Crop Production and Entomology Advisor, Palo Verde Valley
mdrethwisch@ucanr.edu

Onion/Garlic Production Meeting

Thursday, Oct. 17, 2024 – City of Blythe Multipurpose Room, 235 N. Broadway

8-8:30 Registration

8:30 Welcome. Michael Rethwisch, Crop Production and Entomology Farm Advisor, UCCE-Riverside County

8:35 Lallamand biological based products for onion/garlic production. Brian Guess, Lallemand

8:45 Allium Responses to Biostimulants in the Palo Verde Valley. Michael Rethwisch - UCCE

9:00 Insect Pests of Low Desert Onions/Garlic. Michael Rethwisch, UCCE

9:15 Update on FMC Onion and Garlic Products. Dr. Danielle Kirkpatrick, FMC

9:30 Onion Variety responses to Herbicides. Dr. Phil Waisen, UCCE Vegetable Advisor, Riverside-Imperial Cos.

9:55 BASF Products for Onions and Garlic. Brent Wolfe – BASF

10:15 Break

10:25 Crop Water Use and Irrigation Management Issues in Desert Processing Onions and Garlic. Dr. Ali Montazar – UCCE Irrigation Advisor, Imperial County

10:45 Advanced technologies and best practices that improve irrigation efficiency and nitrogen management in fresh market onion production. Dr. Jairo Diaz, Director Desert Research and Extension Center, El Centro

11:05 Overview of Onion and Garlic Diseases. Dr. Alex Putman, Extension Plant Pathologist, UC-Riverside

11:50 Syngenta Onion/Garlic products. Randy Landwerlen/Jeannette Rapicavoli, Syngenta LLC

12:10 Lunch (sponsored by Agrichemical companies)

Application being made for CEUs from CCA, AZ and California

Please RSVP by Noon October 16 to Suzanne (760) 921-5060 (leave a message)

Serving Riverside County Residents Since 1917
University of California, County of Riverside and U.S. Department of Agriculture Cooperating

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Agriculture and Natural Resources | UC Cooperative Extension

JOIN UCCE IMPERIAL COUNTY FOR A

SOUTHERN CALIFORNIA SMALL RUMINANT FAMACHA WORKSHOP

Are you concerned about the management of internal parasites in your small ruminant herd? Are you concerned about dewormers not working like they used to? Join us for a workshop on FAMACHA and internal parasite management for sheep and goats.

Dr. Rosie Busch, Sheep and Goat Herd Health and Production Specialist at UC Davis, will cover internal parasites of small ruminants, teach hands on FAMACHA techniques, and offer FAMACHA certification.

DATE, TIME, & PLACE:

NOVEMBER 15

6-8 PM

Imperial High school
517 W Barioni blvd
Imperial, CA 92251

Free unless you want FAMACHA certification. For those who want certification, the cost is $15/person

Please register at

https://ucanr.edu/socalfamacha

Questions? Reach out to Brooke Latack at 269-313-2579 or bclatack@ucanr.edu

Accommodation requests related to a disability should be made by November 1, 2024 to Brooke Latack (269-313-2579 or bclatack@ucanr.edu).

The University of California, Division of Agriculture and Natural Resources (UC ANR) is an equal opportunity provider.

UCCE IMPERIAL COUNTY INITIATED AN AREAWIDE MONITORING OF KEY INSECT PESTS ACROSS THE IMPREIAL VALLEY

Arun Babu – Entomology Advisor

During the first week of August 2024, the UCCE Entomology program at Imperial County established a yellow sticky trap network across the Imperial Valley. This trap network aimed to facilitate landscape-level monitoring of the population dynamics of adult whiteflies, western flower thrips, flea beetles, and aphids throughout the year. Insect counts from these traps will provide an early warning for growers of imminent population outbreaks of these pests. Additionally, the traps are screened for the presence of potential invasive insect pests, including Asian citrus psyllids, spotted lanternflies, Mexican fruit flies, etc.

Description of the sticky traps

The trap set up in the field consists of a 6 X 12 in (15.2 x 30.5 cm) yellow sticky trap (Olson Products, Medina, OH), shaped into a cylinder, attached to a wooden stake using a binder clip, and positioned about 60 cm above the ground (Fig. 1A and 1B). Insects that are attracted to the yellow color of the traps and those that land on the sticky surface of the trap during the flight get trapped on the sticky surface. The traps are replaced weekly and are examined in the laboratory under a stereo microscope at 10 x magnification to count the pest population.

Where are these traps located?

The traps are distributed throughout the Imperial Valley, covering the major agricultural locations (Fig. 1C). While the overall trap distribution is designed to cover the entire Imperial Valley's agricultural lands, the specific trap locations are chosen randomly to represent pest populations arising from the diverse crop systems of Imperial Valley that are under various crop and pest management practices.

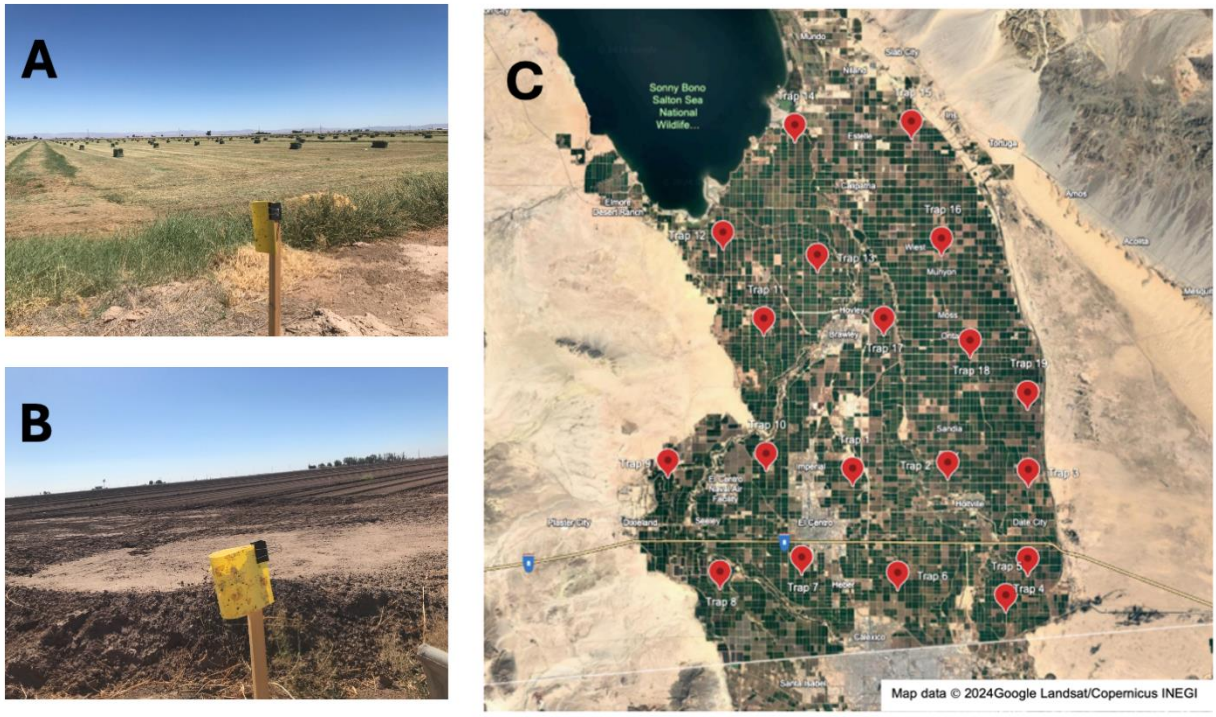


Fig. 1 A & B) Yellow sticky traps in various fields, and C) Trap locations across the Imperial Valley.

How do the pest counts from these traps benefit the growers?

Insect count data from these traps identify the adult insect activity of targeted pests around the field. However, several biological and physical factors and farm operations (insecticide sprays, dust from the land preparation, crop harvest, etc.) often influence insect counts in the traps. Thus, the insect count in sticky traps does not always strongly correlate to the actual infestation levels in the grower's field. Despite this, the trap counts are a valuable indication of adult insects' movement across the landscape. Moreover, collecting the trap data across multiple years will help establish a baseline of pest activity across the season. This historical pest data can then be compared with current pest activity in the traps to identify population trends.

Who funds this project?

Imperial County Agricultural Benefit Program funds this project for the duration of 3 years.

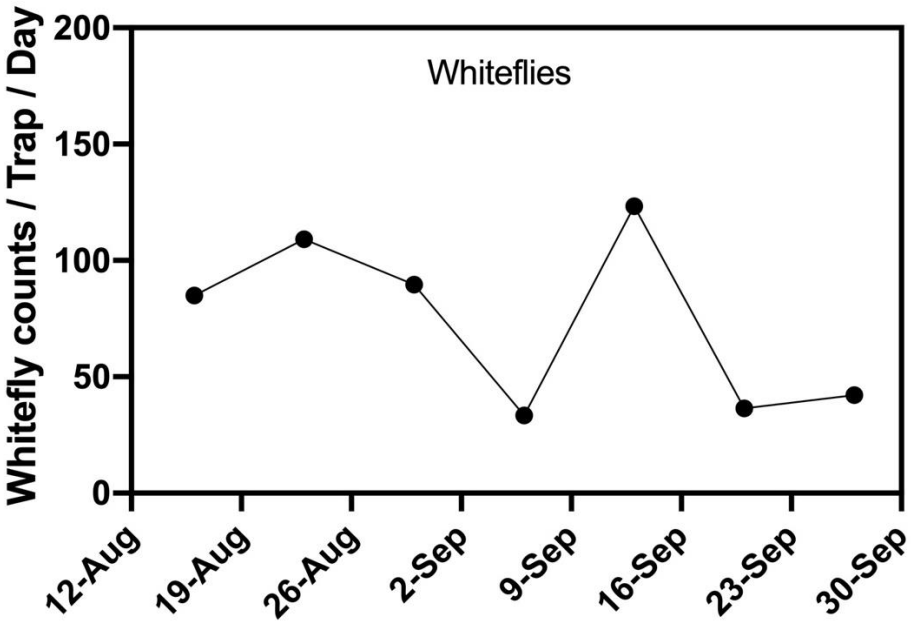
Monitoring traps insect counts updates for August and September 2024

The UCCE Entomology program deployed 19 sticky traps across the Imperial Valley, which are being replaced weekly. The mean insect counts from these traps for each week, presented as insect count per trap per day, for the months of August and September 2024 can be found below. Since we do not have a database on comparable historical data on the population dynamics of these pests from Imperial Valley, at present, other than identifying the general population trends from these graphs, the scope for further interpreting trap capture data is limited.

However, we plan to continue collecting the trap data for at least the next three years to build a database to better understand and predict the seasonal trap capture differences. The trap design and reporting methods we follow are similar to the method followed by Dr. John C. Palumbo for his area-wide pest monitoring traps network maintained for the Yuma County, Arizona. Growers, PCAs, and other stakeholders who wish to compare the general pest population trends between these locations can do so without any data conversion. However, care should be taken when interpreting the data as these data represent adult pest activity from two distinct places that differ in regional cropping patterns, crop diversity, crop management, temperature, humidity, and other environmental and biological factors. Those interested in additional data from this project, including individual trap count data from various trap locations, can contact Arun Babu at (442) 265 -7708 or arbabu@ucanr.edu.

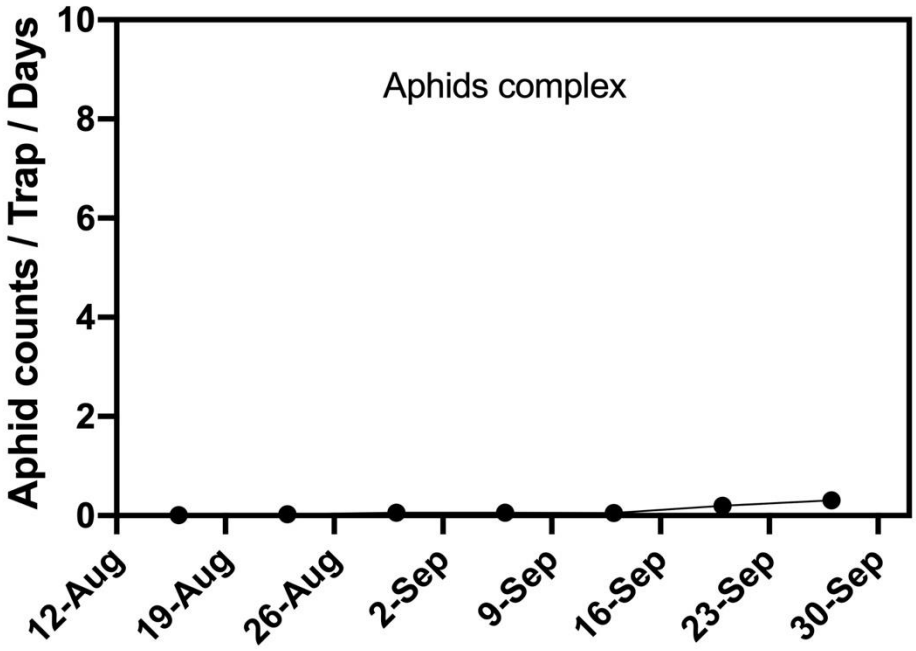
Whitefly count (August and September 2024)

The whitefly counts in the traps consisted mainly of sweetpotato whitefly (*Bemisia tabaci* MEAM1). Additionally, a small fraction of the total count (< 2%) comprises bandedwinged whiteflies, *Trialeurodes abutilonia*.



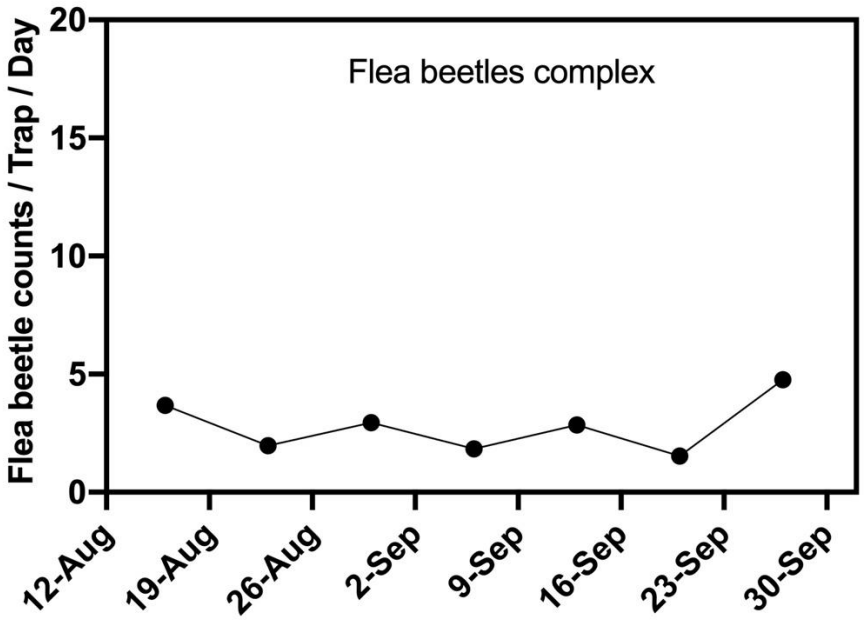
Aphids complex count (August and September 2024)

The trap counts data of aphids below do not focus on any single species, but represent the aphids complex present in the Valley. The trap capture data suggests that alate (winged) aphids were almost absent in the valley during August and until the first half of September.



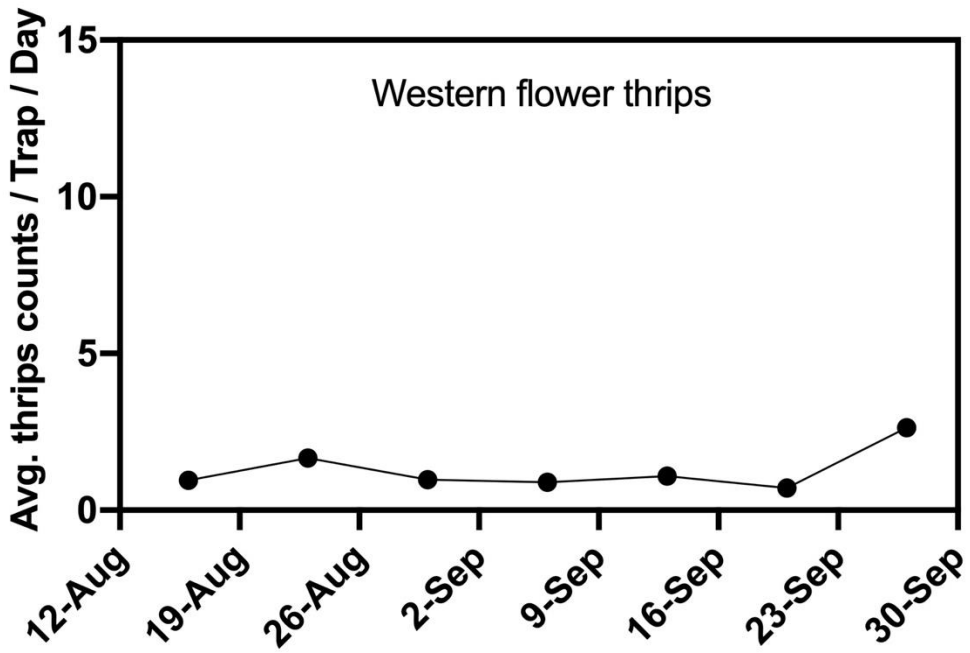
Flea beetle count (August and September 2024)

The flea beetle counts in the traps were predominately of pale-striped flea beetle, *Systena blanda*, desert corn flea beetle, *Chaetocnema ectypa*, and a few other minor species.



Western flower thrips count (August and September 2024)

While the traps contained a number of thrip species, only western flower thrips, *Frankliniella occidentalis,* the major thrip species of concern for a number of crops in Imperial Valley, were counted to provide more specific data.



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.cim is.water.ca.gov. Estimates of the average daily ET_o for the period of October 1 to December 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 inches per day

Station	October		November		December	
	1-15	16-31	1-15	16-30	1-15	16-31
Calipatria	0.21	0.18	0.13	0.11	0.09	0.09
El Centro (Seeley)	0.22	0.18	0.14	0.12	0.10	0.09
Holtville (Meloland)	0.20	0.16	0.13	0.11	0.09	0.08

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/.