UNIVERSITY OF CALIFORNIA
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UC Cooperative Extension

Imperial County Agricultural Briefs

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Features from your Advisors

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BEST NITROGEN AND IRRIGATION MANAGEMENT PRACTICES IN CALIFORNIA LOW DESERT CARROTS

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

Introduction. Carrot is one of the ten major commodities in Imperial County, with an average acreage of nearly 16,000 over the past decade. The farm gate value of fresh market and processing carrots was about 74 million dollars in 2021. In the low desert region, fresh market and processing carrots are planted from September to December for harvest from January to May. Most carrots are typically sprinkler irrigated for stand establishment and subsequently furrow irrigated for the remainder of the growing season. However, there are fields that are irrigated by solid set sprinkler systems the entire crop season (Figure 1.).

Figure 1. Carrot field under solid set sprinkler irrigation system in the Imperial Valley.

Carrot is a cool-season crop that demands specific growing conditions and effective use of nitrogen (N) and water applications for successful commercial production. N and water management in carrot is crucial for increasing crop productivity and decreasing costs and nitrate leaching losses. Appropriate soil fertility and uniform soil water availability are critical for good root formation. Carrot roots are vulnerable to forking, which can be caused by over applying N fertilizer. Excessive watering increases the incidence of hairy roots, discourages good color formation, and may encourage disease. Also, severe drying and wetting cycles result in significant splitting of roots. The N needs of carrots for optimum storage root yield depends on the climate, soil texture and conditions, residual soil N from the previous season, and irrigation management.

This article summarizes some of the findings of a recent four-year study conducted at the UC Desert Research and Extension Center (DREC) in Holtville and 13 commercial fields in the low desert.

Field experiment. In the DREC trials (Figure 2), four N fertilizer strategies (N1: 140, N2: 185, N3: 235, and N4: 275 lbs. ac^{-1}) were assessed under two irrigation regimes (I1: 100% crop ET and I2: 125% crop ET. ET stands for crop evapotranspiration). In each plot, irrigation regime (as main driver) and N strategy (as secondary driver) were investigated in a Randomized Complete Block Design with Split Plot Arrangement over four replications. In the commercial trials, due to logistical limitations, the experiments were carried out in plots with an area of 400 feet by 400 feet under irrigation and N fertilizer management practices followed by growers.

Figure 2. An aerial view of the carrot trial (fresh market carrots) at the DREC (2021-2022) during an irrigation event.

Soil nitrate content (NO_3-N) and total N percentage in tops and roots were determined monthly through laboratory analysis. Preplant and post-harvest soil samples are taken from six depths (1-6 ft.). At other sampling dates, soil is collected from the top three depths (1-3 ft.). A composite soil sample is analyzed from each layer for NO_3-N content. Plant measurements is carried out on 40-plant samples collected randomly (per plot in the DREC trial, and from five sub-areas at the commercial sites) and determinations are made on root yield and biomass accumulation. Fresh weight and dry weight of roots and foliage were measured on a regular basis.

Effect of irrigation regimes and N application rates. While an insignificant impact was found from the interaction of irrigation and nitrogen regimes on the fresh and dry matter root yields, these measures were significantly lower in I1N4 (100% ET and N application rate of 275 lbs. ac^{-1}) and I2N1 (120% ET and N application rate of 140 lbs. ac^{-1}) treatments (Figure 3). The findings suggested insignificant root yield reduction because of reducing a 40% N rate (N application rate of 140 lbs. ac^{-1}) in 100%ET irrigation regime. The N concentration in fresh carrot roots varied from 4.2 to 4.7 lbs. ton^{-1} at harvest, however, no significant differences were found among the treatments ($P<0.05$).

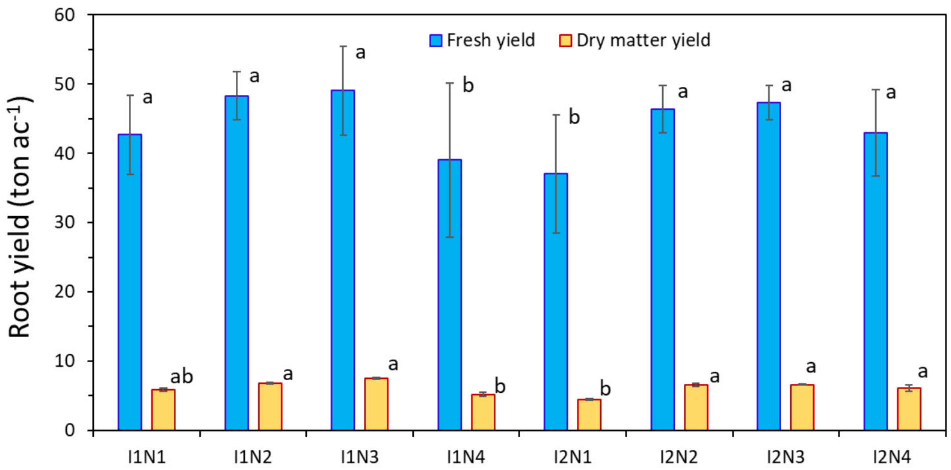

Figure 3. Effect of irrigation regimes and N application rates on fresh and dry matter root yields at harvest (2021-2022 trial). The different letters above the columns indicate significant differences among the treatments at $p < 0.05$.

Nitrogen management. The developed N uptake curves suggested that nearly 50% of the total N was taken up during a 50-day period (80-130 days after seeding) (Figure 4). This 50-day period appears to be the most critical period for N uptake, particularly in the storage roots, when carrots developed the large canopy and the extensive rooting system. For a 160-day crop season, 22% of N uptake could be accomplished over the last 30-day before harvest.

Carrots have a deep rooting system that allows for improved capture of N from deep in the soil profile. The fibrous roots were present at the depth of five feet below the soil surface the DREC trials (Fig. 3). There is a risk of leaching soil residual N due to heavy pre-irrigation (a common practice for salinity management in the low desert) in late summer prior to land preparation. N is likely accumulated at the deeper depths by the beginning of the growing season, and consequently, there is a potential N contribution from the soil for carrots when the roots are fully developed.

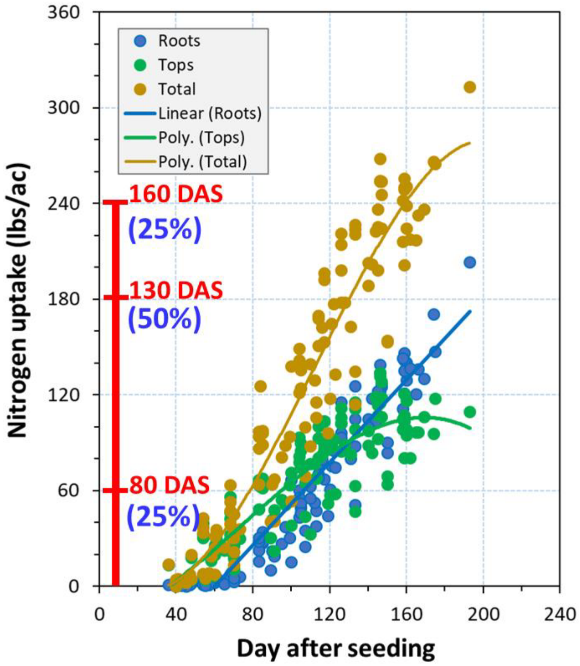

Figure 4. N accumulation trends in storage roots, tops, and total (plants) over the growing season at the experimental sites.

Conclusions. (1) In the desert, nitrogen application rates greater than 140 lbs. ac^{-1} couldn't have a significant impact on root yield in a well-managed irrigated field. However, higher N rates are likely necessary in over irrigated carrot fields and/or sandy soils to maximize root yield. (2) Positive impact of N application rate on root yield was observed but statistically no significant relation was found. (3) Carrots need variable seasonal water application that depends on planting time, length of season, variety, soil types, and irrigation efficiency. The approximate gross irrigation water needs of carrot fields in the low desert would be 2.1 - 2.7 ac-feet/ac (plus pre-irrigation). Pre-irrigation along with proper irrigation scheduling over the season may effectively maintain crop water needs and soil salinity in carrot fields.

Recommendations. Careful management of N applications in the low desert carrots is crucial because fertilizers are the main source of N, particularly due to low organic matter content of the soils and very low nitrate level of the Colorado River water. The data from the DREC trial showed with 140 pounds nitrogen unit per acre, there is no significant root yield impact. In a well-managed irrigated carrot field with a decent soil nitrogen residual from the past season, we could consider this aggressive reduced application rate. Soil and plant lab analysis and/or nitrate quick tests in the season will be very beneficial to ensure soil nitrogen availability. Growers are encouraged to try less aggressive reduced N rate (10-20% lower than their current practice, for instance 180-200 pounds nitrogen unit per acre) on a small field to see how it fits their specific farming practices before they adopt it on a widespread basis.

Acknowledgements. Funding for this study was provided by the California Department of Food and Agriculture (CDFA) - Fertilizer Research and Education Program (FREP) and the California Fresh Carrot Advisory Board.

SOIL HEALTH AND NEMATODE RESPONSE TO INTEGRATING SUDAN GRASS ROTATION WITH REDUCED-RISK NEMATICIDES ON CARROT IN IMPERIAL VALLEY

***Philip Waisen**, Vegetable Crops Advisor, UCCE Riverside and Imperial Counties*

Introduction

In Imperial County, carrots (*Daucus carota*) and Sudan grass (*Sorghum × drummondii*) are economically important crops that each contributed more than $63 and $33 million, respectively, in 2021 (Imperial County Agricultural Commissioner, 2021). Sudan grass is planted from March-June to harvest from July-November and carrot is planted from August-February to harvest from December-June. These planting and harvesting dates naturally permit Sudan grass and carrot to be grown in rotation. As a rotation crop, Sudan grass can reduce common nematode parasites of carrots like root-knot (*Meloidogyne* spp.), stubby root (*Paratrichodorus* spp.), and root lesion (*Pratylenchus* spp.) nematodes. One should, however, note that Sudan grass is a good host of needle nematodes (*Longidorus* spp.), an economically important nematode on carrots in Imperial Valley. Cultivation of Sudan grass and incorporation of its residues, after cutting hay, enriches the soil with nutrients and adds organic matter to stimulate soil microbial activity, mainly bacterial and fungal decomposition. Because soil health is a function of microbial activity, changes in soil health conditions can be reflected in the demographic shift of microbivorous nematodes such as bacterial, fungal, and omnivorous nematodes, here referred to as bacterivores, frugivores, and omnivores, respectively. An increase in omnivorous nematodes can reduce plant-parasitic nematodes because omnivores feed on members of other nematode trophic groups. Young plants and leaves of Sudan grass contain a secondary metabolite called dhurrin (cyanogenetic glucoside dhurrin). Mechanical damage during the cutting of Sudan grass hay can activate emulsin, an enzyme also stored in tissues, to break down dhurrin to release prussic acid or hydrocyanic acid (hydrogen cyanide) which can naturally sterilize the soil.

Figure 1. Carrot field treatment plots a) at the time of installing the treatment, and b) at 3 months after the treatment.

For these reasons, Sudan grass-carrot rotation is more beneficial. Integrating Sudan grass-carrot rotation with reduced-risk nematicides aligns with the state's focus on promoting the use of environmentally sound pest management practices.

The objective of this study was to examine the integration of Sudan grass rotation with reduced-risk nematodes on soil health and nematode in the carrot agroecosystem.

Materials and Methods

A field trial was conducted at the end of Sudan grass crop in early Fall of 2022 in Brawley (32˚59'56''N-115˚39'45''W). Sudan grass residue was incorporated after cutting hay. Three nematicide treatments were tested and these included Salibro™ (fluazaindolizine; Corteva Agriscience, Alberta, Canada), Velum® One (fluopyram; Bayer CropScience, St. Louise, MO), and untreated control. The nematicide treatments were directly applied on the seed beds using a battery-powered Shurflo SRS-600 Sprayer Pump (Bellspray, Inc., Opelousas, LA). Salibro was applied at 31.0 fl oz/ac and Velum at 13.6 fl oz/ac two weeks after planting. The field was initially sprinkler irrigated for two weeks to germinate carrot seeds followed by furrow irrigation. Each treatment was replicated 4 times and arranged in a randomized complete block design. Twelve treatment plots each measuring 25×18 ft were directly seeded with carrots on 60-inch beds. Soil samples were collected before nematicide treatment to document initial condition and at monthly intervals thereafter for the duration of the crop (1 month as of this report). At each time of sampling, 18 discrete soil samples per plot were systematically collected from the top 4 inches of the root zone. The soil samples were composited, homogenized, and an aliquot of 100 cm^3 per treatment plot was subjected to Baermann method for nematode extraction. Data analysis was done using Statistical Analytical Software version 9.4 (SAS Institute Inc., Cary, NC). Data were checked for normality using Proc Univariate in SAS. Wherever necessary, data was normalized using log10 (x+1) and subjected to a one-way analysis of variance using Proc GLM in SAS. Means were separated using the Waller–Duncan *k*-ratio (*k*=100) *t*-test whenever appropriate and only true means were presented.

Results and Discussion

This is a progress report of a four-month-long study (September-February) and the results presented here are up to 1- month post-treatment. Interestingly, untreated control treatment (no nematicide-treated plots) had a high number of microbivorous nematodes at the end of Sudan grass crop (data not shown) and remained high one month after installing the treatments (Fig. 2A-C). This was a clear indication of Sudan grass improving soil health conditions. In fact, Velum nematicide treatment negatively impacted the soil health as reflected by the declining trends in the abundance of beneficial nematodes; bacterivores, fungivores, and omnivores (Fig. 2A-C). The abundance of bacterial-feeding nematodes and omnivorous nematodes was significantly reduced by Velum treatment while Salibro treatment had no impact on these beneficial nematodes compared to untreated control (Fig. 2A-C). As far as the effects of Velum and Salibro, their performances are in line with findings from a recent study in Coachella Valley where Velum reduced both beneficial and parasitic nematodes alike (Waisen, 2023). Impacts of nematicide treatments on fungivorous and herbivorous nematodes were negligible but declining numerical trends were apparent in Velum (Fig. 2B and D). This appeared to suggest that both nematode trophic groups could be suppressed in subsequent samplings towards the end of the cropping cycle. It is worth noting that the abundance of the plant-parasitic nematodes (herbivores) was low to start with at the end of Sudan grass and remained low one month after nematicide treatment. Improvement of soil health conditions by Sudan grass or as a non-host crop could have antagonized or at a disadvantage of parasitic nematodes. In this field, root-knot, stubby root, ring (*Mesocriconema* spp.), and stem and bulb (*Ditylenchus* spp.) nematodes were detected, which were all nematode pests of carrots. Needle nematode, an economically important nematode pest in Imperial Valley, however, was not detected so far.

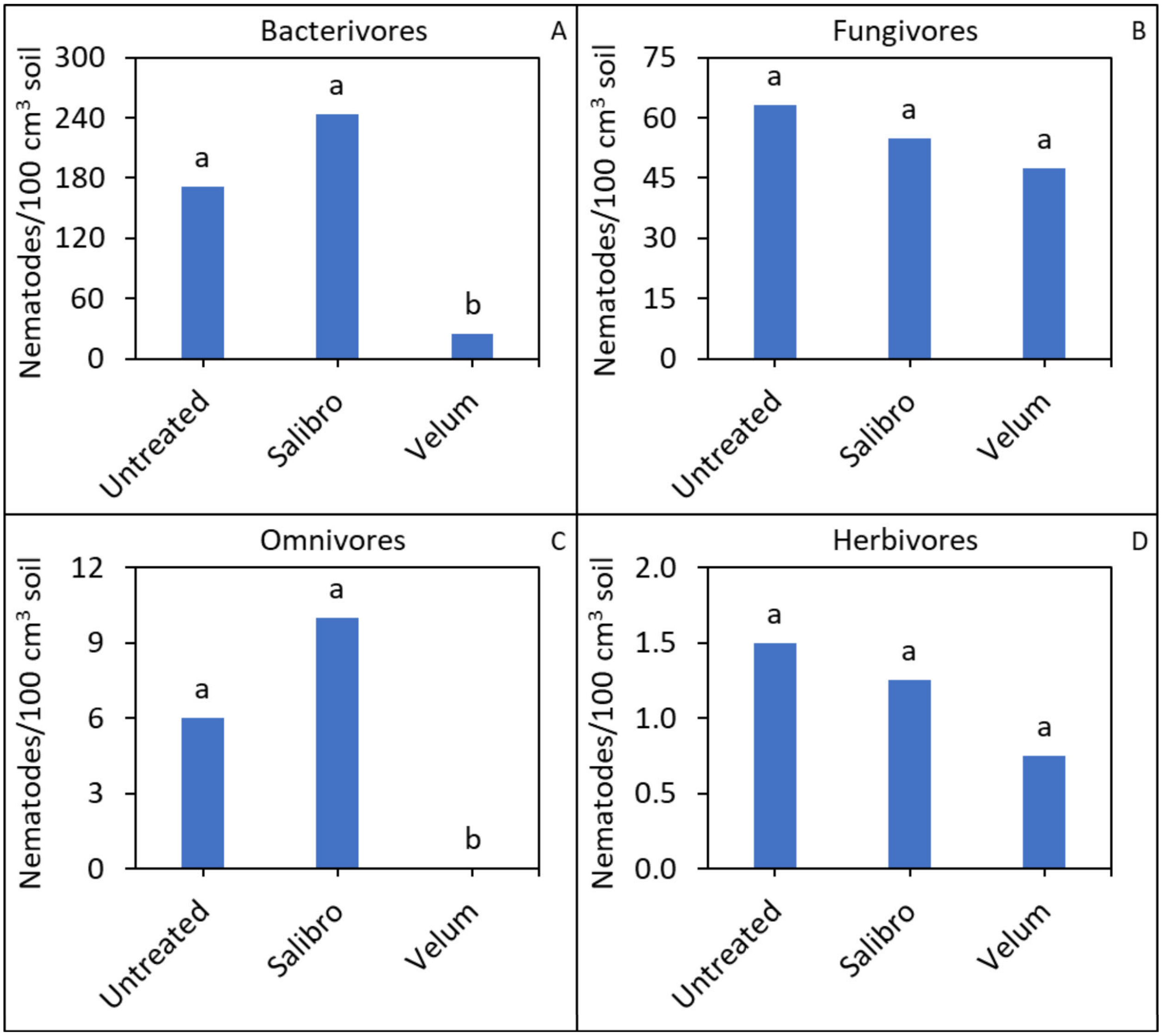

Figure 2. Population densities of A) bacterivores, B) fungivores, C) omnivores, and D) herbivores in the top 4 inches of the soil 1 month after the nematicide treatment. Bars represent means (*n*=4) and those followed by the same letter(s) are not different, according to the Waller–Duncan *k*-ratio (*k*=100) *t*-test.

Conclusion

While the second and third monthly nematode soil sample results are pending, we are clearly seeing the effects of integrating Sudan grass with reduced-risk nematicides one month after the nematicide treatment. The effects of Velum appeared to be non-discriminatory on both beneficial and parasitic nematodes. This can be detrimental to soil health as beneficial nematodes are negatively impacted. In other words, the soil health benefits of Sudan grass rotation could be negated by Velum nematicide treatment. In contrast, integrating Salibro with Sugan grass appeared to be a promising option at this point of the study.

References

1. Imperial County Agricultural Commissioner. 2021. Imperial County Agricultural Crop and Livestock Report. Retrieved from http://agcom.imperialcounty.org/wp-content/uploads/2022/10/2021-CR-Draft-Final.pdf

2. *Waisen, P.* 2023. Effects of reduced-risk selective nematicides on target and non-target nematodes in low desert vegetable production systems – Final report. Imperial Agricultural Briefs 26(1):133-137. https://ceimperial.ucanr.edu/newsletters/Ag_Briefs95855.pdf

PLANT HEIGHT AND INSECTICIDE INTERACTIONS FOR LOW DESERT ALFALFA APHID CONTROL

Michael D. Rethwisch, Field Crops Farm Advisor, UCCE Riverside County, Palo Verde Valley Office
Sarah Unzon Gonzalez, Student Assistant, UCCE Riverside County, Palo Verde Valley Office
Anissa Soria, Student Assistant, UCCE Riverside County, Palo Verde Valley Office

Most of the widely used effective aphid insecticides in low desert alfalfa (Sefina® Inscalis® and Sivanto® Prime in California, plus Transform® WG in Arizona) are acropetally systemic, which means they move up and out towards new growing tissue, but do not move rapidly downward to protect the plant underneath the sprayed foliage. As aphids can multiple rapidly, uncontrolled aphids after an application and can continue to build in population and potentially cause economic loss even after an insecticide application.

This has resulted in the following question: “Can applying aphid insecticides very early in the regrowth cycle provide effective control with very little foliage present?” “If so, what is the duration of efficacy?”

A replicated field trial was conducted on a second year stand of alfalfa hay in the Palo Verde Valley, with applications made at four different alfalfa stem regrowth sizes (Stubble (3.5”, 6”, 9”, and 12”). This particular field was already infested with cowpea aphids at time of initial application, which allowed data to be collected for cowpea aphid control as well as subsequent infestations of blue alfalfa aphids.

Data indicated that the stubble treatment (Feb. 14) did provide some efficacy and related alfalfa growth (better growth is darker green in color) as seen in Fig. 1, in which untreated squares are also visible (yellow areas among the blue areas) as stunted/stressed growth. This was also evident, but to a lesser extent, when treatments were applied on Feb. 18 when stem height averaged just under 6 inches in height and Feb. 24 treatment at 9 inches of average stem height.

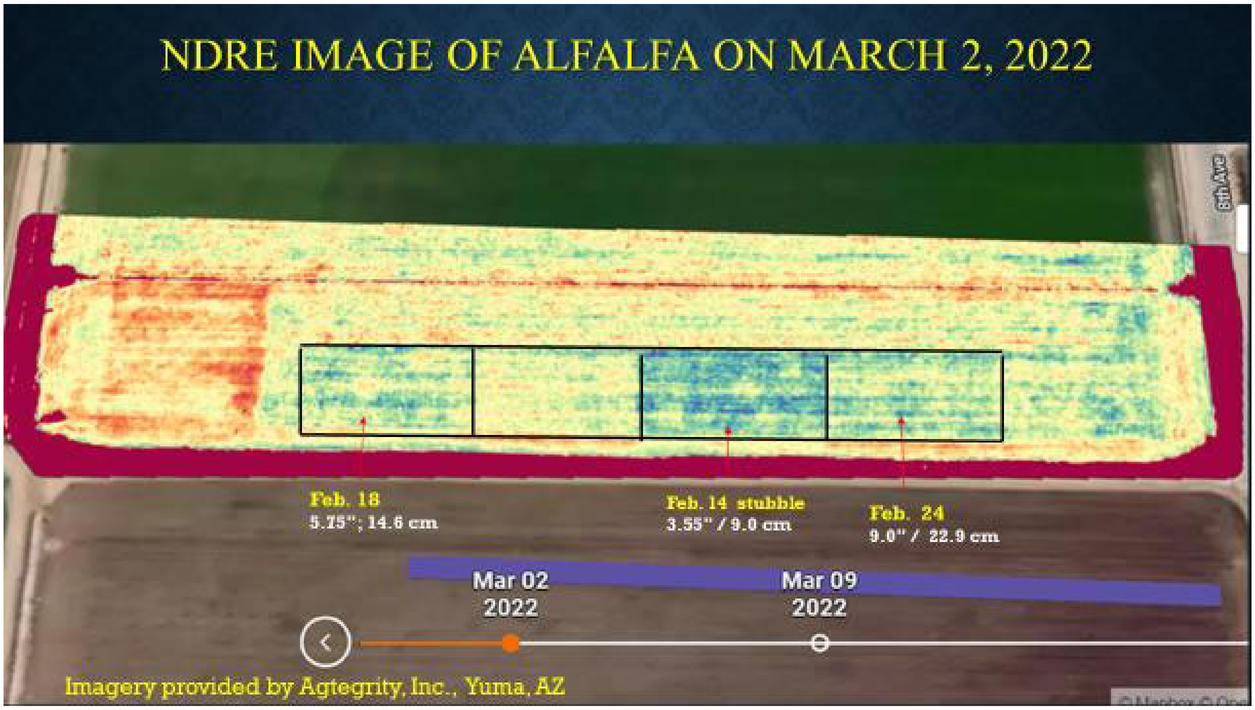

Fig. 1. Alfalfa regrowth/stress effects of cowpea aphids on March 2, 2022, following insecticide applications on Feb. 14, 18 and 24. The darker the blue area indicates less stress from aphid feeding.

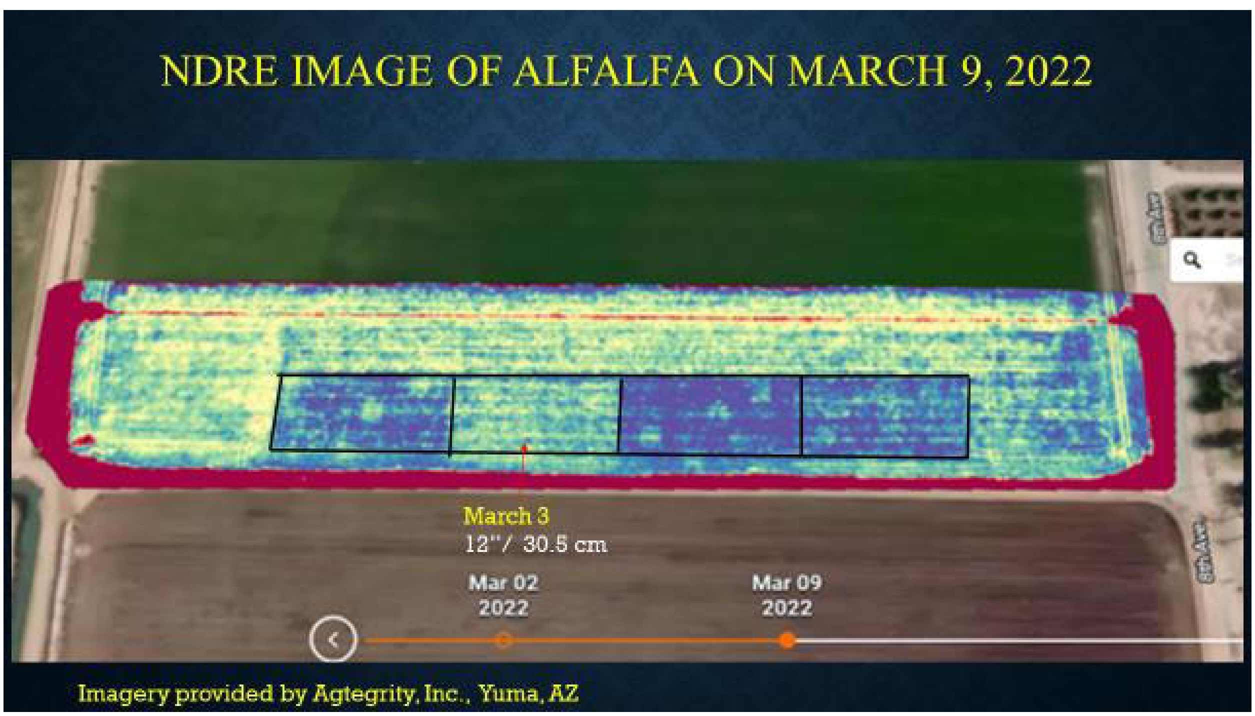

Fig. 2. Comparison of alfalfa regrowth/stress on March 9, 2022, resulting from insecticide applications made at four different average stem heights, Blythe, CA.

The above drone images provided evidence that applying aphid insecticides very early in the regrowth cycle can provide effective control with very little foliage present, at least when cowpea aphids were already present. The next question of "what is the duration of efficacy" indicates that for the earlier applications that the higher rates of the chemistries evaluated usually provided increased efficacy compared to the lower rates.

One interesting note was that Sefina® Inscalis® insecticide treatments (at least the 6 oz./acre rate) provided much less reduction in cowpea aphids in the first sample following each of the four insecticide applications, but then increased over time (Figs. 3-4).

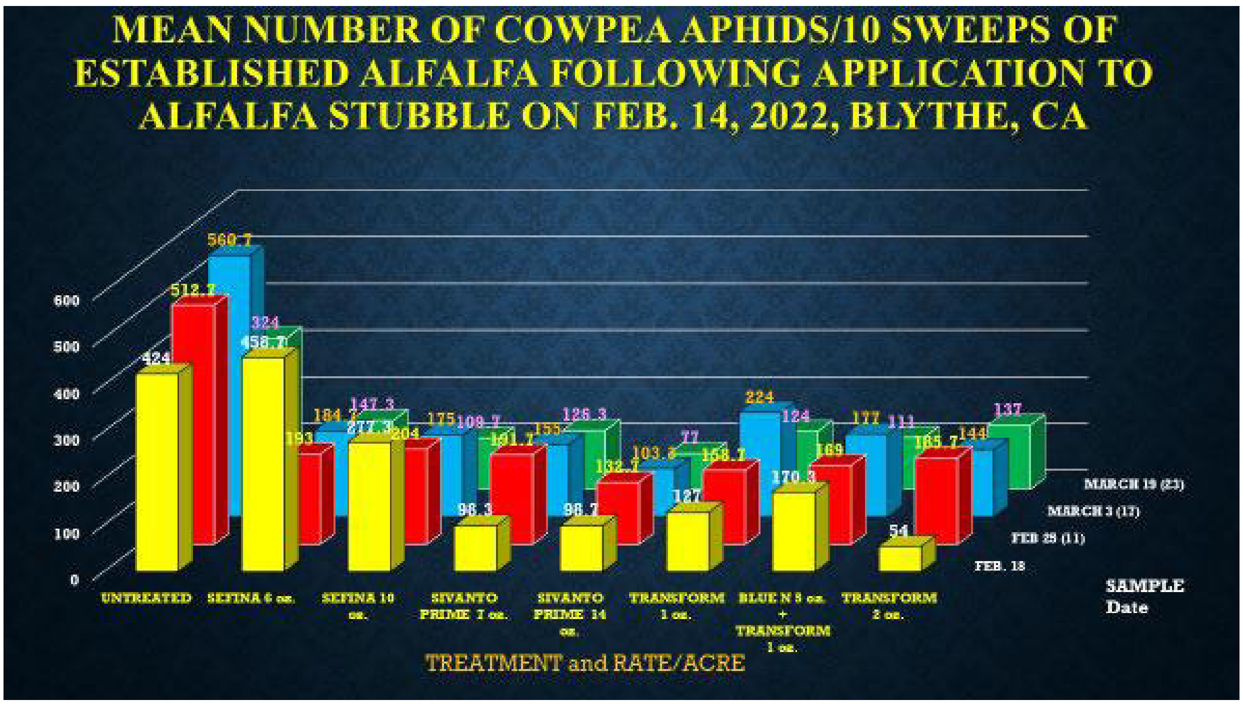

Fig. 3. Mean number of cowpea aphids following insecticide application to stubble alfalfa. Cowpea aphids peaked on March 3 in this experiment. Data for the first sample date (Feb. 18) is in the foreground, with last sample date (March 9) shown as the last set of bars in the back of the graph.

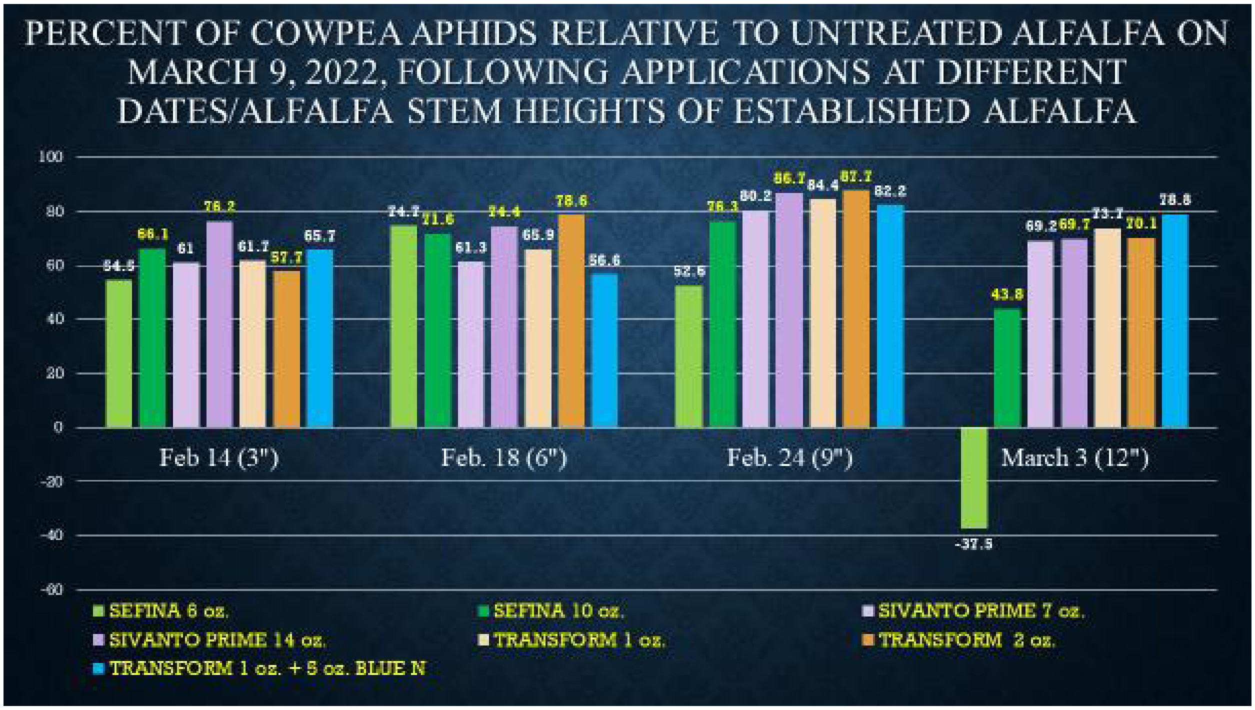

Fig. 4. Cowpea aphid percent reduction relative to untreated alfalfa from the March 9, 2022, sample date. Sefina applications consistently provided less control in all initial sample dates compared to other insecticides in the trial, but resulted in increased efficacy after the first sample date (See March 3 above and compare to earlier application dates).

This project was funded in part by the California Alfalfa and Forage Research Foundation, with additional support from agrichemical companies. Their support is gratefully acknowledged.

SWEEP PILOT PROGRAM 2023

A HUGE CONGRATULATIONS TO OUR AGRICULTURAL COMMUNITY

Ana Resendiz – Community Education Specialist II, Climate Smart Agriculture Program

It was great news when CDFA announced the State Water Efficiency and Engagement Program (SWEEP) Southern Desert Pilot Program, proposed for farmers in Imperial County and a portion of Riverside County. Unlike the regular SWEEP, the applicants did not require a project that would decrease GHG emissions, but for this pilot, water conservation projects that would not increase GHG emissions were also eligible. This SWEEP pilot program allowed farmers to participate in projects tailored to the local needs.

The SWEEP pilot program will provide those selected with financial assistance of up to $200,000 for 18 months of project implementation. The selection process was competitive, and the criteria were feasibility, the amount of water saved and calculations, the guarantee of no increase in GHG emissions, and the budget.

Seventeen projects were selected for a total of $2,716,877, of which 11 projects were awarded in Imperial County for a total of $1,997,770 in funds to improve the infrastructure of irrigation systems, automation, and fuel conversion, among other practices that will have a significant impact not only on saving water and energy but also on better management of the different resources that are invariably related to water management. This pilot demonstrated the great interest of farmers in the region in adopting new irrigation practices that make their systems more efficient. Great news for our agricultural community on adopting climate-smart agricultural practices. Congratulations to all the award winners! A list of the selected projects can be found in the following table:

Applicant Organization	Project Categories	Funds Requested	Matching Founds	County
Jesus Espinoza Viesca	Irrigation System Changes, Improved Irrigation Infrastructure	$61,671	$0	Imperial
Junior Enterprises LLC	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Energy Efficiency of Pumps and Variable Frequency Drives (VFD) Converting to A Lower Pressure Systems	$200,000	$0	Riverside

Hummingbird Ranches LLC	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling	$56,344	$3,451	Riverside
Osage Citrus LLC	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Improved Energy Efficiency of Pumps and Variable Frequency Drives (VFD)	$172,411	$5,836	Imperial
Jensen Family Trust	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling	$78,700	$4,625	Riverside
James Abatti	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$196,748	$12,366	Imperial
Gerardo Irungaray	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$196,335	$0	Imperial
Chaffin Farms	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$199,975	$0	Riverside
Emiliana Irungaray	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$197,785	$0	Imperial
S & L Land CO., LLC	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$200,000	$0	Imperial
Pauma Ranches Inc	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling	$59,172	$2,323	Riverside
Norberto Irungaray	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$173,015	$0	Imperial
Ben Abatti Jr	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$199,825	$0	Imperial
Ronald C. Leimgruber Farms	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure	$199,980	$0	Imperial
The Elmore Company	Irrigation System Changes, Improved Irrigation Infrastructure, Converting to A Lower Pressure Systems	$200,000	$1,250,186	Imperial
Dorsey Family Groves	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Improved Irrigation Infrastructure,	$124,916	$324,434	Riverside

	Improved Energy Efficiency of Pumps and Variable Frequency Drives (VFD)			
Rothfleisch Ranches, Inc	Weather, Soil, Plant, Or Flow Based Sensors for Irrigation Scheduling, Irrigation System Changes, Improved Irrigation Infrastructure, Fuel Conversion, Improved Energy Efficiency of Pumps and Variable Frequency Drives (VFD)	$200,000	$708,432	Imperial

2023 CALIFORNIA DATE PALM WORKSHOP

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

University of California Cooperative Extension - Imperial County in partnership with the California Date Commission held the 2023 California Date Palm Workshop at the Coachella Valley History Museum in Indio. The workshop was held as an in-person event on March 1st. At this event, eight speakers from UC Riverside, USDA-ARS National Clonal Germplasm Repository for Citrus & Dates, UCCE Imperial and Riverside Counties, University of Arizona, Riverside County Agricultural Commissioner Office, and private sectors came together to bring innovative ideas and solutions; and disseminate the outcomes of their recent studies and experiences in date palm. Supervisor Manuel Perez, Fourth District Supervisor on the Riverside County Board of Supervisors, delivered the opening comments. The California Date Commission reported recent research and marketing efforts. The event was organized by UCCE Imperial County advisor, Ali Montazar in close collaboration with the California Date Commission. We thank all presenters, growers, industries, and other participants for making this event successful.

Andrea Ramirez and Nannette Kniffin, UCCE Imperial County staff, assist attendees on the registration desk.

Supervisor Manuel Perez delivers the opening comments.

Albert Keck, Chairman of the California Date Commission, delivers a welcome address.

Workshop's attendees are getting ready for the first speaker to begin.

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

Vegetable and Organic Production Workshop
April 13, 2023
Imperial County Farm Bureau, Boardroom
1000 Broadway, El Centro, CA 92243

Registration link:
https://surveys.ucanr.edu/survey.cfm?surveynumber=39939

	8:00 a.m. – 12:15 p.m.
8:00	Registration
8:30	**Welcome & introductions** – Board of Director *– Oli Bachie, UCCE Imperial and San Diego County Director*
8:35	**Benefit of drip irrigation for vegetable and organic production** – *Ali Montazar, Irrigation and Water Management Advisor, UCCE Imperial, Riverside & San Diego counties.*
8:55	**Weed management for vegetable and organic production** – *Oli Bachie, Agronomy & Weed Management Advisor, UCCE Imperial, Riverside & San Diego Counties*
9:15	**Considerations for organic livestock production** – Brooke Latack, *Livestock Advisor*, *UCCE Imperial, Riverside & San Bernadino counties*
9:35	**Perspective on Cole Crop Residue as Biofumigants for Soilborne Disease Management in Vegetable Cropping Systems** – *Philip Waisen, Vegetable Crops Advisor, UCCE Riverside and Imperial Counties*
9:55	**Organic pest control for crops in Imperial County** – *Michael Rethwisch, Crop Production and Entomology Advisor, UCCE Riverside County*
10:15	**Break (10 minutes)**
10:25	**Industrial updates** – *Luis Solari, Field Development Team at **Certis Biologicals***
10:45	**Nutrient Management in Organic Vegetables –** *Milt McGiffen, CE Specialist and Plant Physiologist, UC ANR/UC Riverside*
11:05	**Overview of Organic Production in California and Nitrogen Management in Organic Production** – *Joji Muramoto, Organic Production Specialist, UC ANR/UC Santa Cruz*
11:25	**Updates on the UC Organic Agriculture Institute activities and Grower Survey** – Houston Wilson, Director – Organic Agriculture Institute, Asst. Cooperative Extension Specialist, UC Riverside
11:55	**Organic Vegetable Field Trials to Assess Food Safety and Biological Soil Amendments of Animal Origin** – *Michele T Jay-Russell, Researcher, Western Center for Food Safety, UC Davis*
12:15	**Insect pest Management Options for Organic Production System** – *Eric Middleton, UCCE Area IPM Advisor, San Diego County*
12:35	**Food Surface and Liquid Decontamination Technologies for Organic Production –** *Jimmy Nguyen, Food Safety and Organic Production Advisor, Imperial & Riverside Counties*

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

PENDING CEU CREDITS: CALIFORNIA DPR (--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 March 1st to May 31st 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	March		April		May	
	1-15	16-31	1-15	16-30	1-15	16-31
Calipatria	0.16	0.19	0.22	0.25	0.27	0.29
El Centro (Seeley)	0.19	0.22	0.24	0.28	0.29	0.31
Holtville (Meloland)	0.17	0.21	0.23	0.27	0.29	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/.