Extension Connection

SAN DIEGO

SEPTEMBER 2024
ISSUE 009

UC CE
UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources
Cooperative Extension

Publication by
University of California Cooperative Extension

Contents

SEPTEMBER 2024

Click article to jump to page.

INTRODUCTION FROM OUR COUNTY DIRECTOR

Dear Readers,

As the heat of Summer subsides and we welcome the cool breeze, colors and calmness of the Fall, we are excited to present the Fall edition of UCCE San Diego County Extension Connection Newsletter. This issue includes informative articles and updates about projects, events and new staff members in our office.

Speaking of change, we want to take this opportunity to thank Chris McDonald, Natural Resources Advisor for Riverside, San Bernardino and San Diego Counties who up until June 30, 2024, served as County Co-Director for our UCCE San Diego County Office. We would also like to welcome Valerie Mellano, who has rejoined our office as County Col-Director starting on July 1, 2024, after a 10+ year absence from UC during which she served as Chair for the Plant Science Department at Cal Poly Pomona. Please join us in expressing our gratitude to Chris for his service to our office, to our clientele and to San Diego County; and in welcoming Val Mellano back in our office.

Water availability and its associated cost is one of the biggest factors impacting agriculture in San Diego County. Efficient water management is critical for the economic viability of agricultural operations and for compliance with water quality and runoff regulations. The first article in our newsletter explores the benefits and cost associated with pressure compensating spray stakes for nursery production. While the results demonstrate significant savings in water used and improvements in distribution uniformity and compliance with water quality regulations, the cost of this technology may be prohibitive for widespread adoption by the industry. The second article evaluates the use and benefits of various soil moisture sensing technologies and tools to improve water use efficiency and profitability among avocado growers. The study found that a significant number of avocado growers already use soil moisture sensing technologies and tools to schedule irrigation in their groves. However, good analysis and interpretation of the data collected, integrated with knowledge of soil conditions, plant status and other practices are needed to achieve better results.

We are also proud to highlight the work done by two of our most important, community focused programs in San Diego County, the UC Master Food Preservers, our newest program, and the UC Master Gardener Program, our oldest program. The UC Master Food Preservers broke new ground by collaborating with Olivewood Gardens to collaborate with "The Kitchenistas", the first Spanish-Language Steam Canning class in California. On the growing side, the UC Master Gardeners provide tips on what plants to grow and how to manage our gardens as we move into the fall. Most importantly, they provide information and details on training opportunities for county residents who may want to join the program as new/prospective master gardeners.

Finally, we would like to welcome Derrick Robinson, Urban Agriculture, Food Systems and Environmental Issues Advisor and Sabina Padilla, Community Education Specialist with our Expanded Food and Nutrition Education Program (EFNEP). Please join us in welcoming Derrick and Sabina and wishing them a long and successful careers as part our UCCE San Diego team.

Enjoy the Fall Season!!

Ramiro and Val
County Co-Directors

Spray-Stakes With Pressure-Compensating Emitters For Nursery Production: Cost And Water Savings

Spray-stakes for nursery production

Spray-stakes have been a staple of the nursery industry for decades. The innovator in the field of spray-stakes has been Roberts Irrigation products from San Marcos (now Primerus Products) that started producing the famous Spot Spitters in the 1970's. These are one of the first examples of localized irrigation (aka micro-irrigation) that allows water to be applied directly to the root zone, as opposed to overhead sprinkler systems that apply water to the whole field. Localized irrigation technologies have great potential for water and nutrient conservation, particularly in containerized systems where the water that falls between containers is inevitably lost and potentially generates water and nutrient runoff (Abdi et al, 2021; Bilderback, 2002). This makes spray stakes particularly well suited for large containers and therefore are mostly used in tree, shrub and palm tree production (Fulcher et al. 2016). However, their distribution uniformity is anecdotally reported to be lower than in drip systems.

Spot Spitters are hard plastic stakes that on one side are inserted into the container substrate, and on the other side plug into a 1/8" spaghetti tubing. The function of the stake is to hold the tubing over the container while it sprays downwards towards the substrate. A slot in the plastic pin that plugs into the tubing creates an opening for water to come out and acts as a spray nozzle. Different colors are associated with different slot sizes and spray angles, creating different flowrates. The side of the stake that sticks into the substrate also has a 1/8" size pin, but without the slot, which is used to plug the tubing when the container is harvested from the field. This feature allows

Fig. 1. Example of Netafim non-pressure compensating spray-atakes in a 15 gallon pot.

workers to "turn on and off" spray-stakes when they are not in operation preventing the production of irrigation runoff. The simplicity of spray-stake technology and operation is the basis for its success. Spray-stakes operate at pressures between 15 and 25 psi. Other companies, including Netafim and Jain irrigation produce spray-stakes that operate similarly.

While spray-stakes offer many advantages, the spray orifice lacks a tortuous path, making the flowrate sensitive to pressure differences. This variability is created by the angle at which the spaghetti has been cut, the depth of insertion of the stake into the spaghetti, etc., and thus creates variability in the volume of water applied by each spray-stake. There are also reports of plugging issues with the spray slot of low flowrate models. Other challenges are associated with the amount of area covered by the stake spray pattern within the container, with the risk of preferential flow through the substrate when the flowrate is high, and the covered area is small.

Lamack and Niemiera (1993) measured application efficiency in Spot Spitters and showed that higher efficiency was associated with lower application rates and with intermittent irrigations.

Recently, manufacturers have commercialized spray-stakes equipped with an assembly of tubing and a pressure compensating (PC) emitter that plugs into the main supply hose. The addition of a pressure compensating emitter produces a flowrate that is independent of the upstream pressure. This new solution, although more expensive, should produce more uniform volumes of water being applied to each plant container.

In this study we evaluated two brands of spray-stakes without pressure compensating emitters and two models of the same brands with pressure compensating emitters, measuring distribution uniformity of the low quarter (Clemmens and Solomon, 1997). Based on the collected data, we also attempted a cost comparison using current water prices in San Diego County.

What we measured

In this study, we tested Primerus Spot Spitters with and without pressure compensation and Netafim sprinklers with and without pressure compensation. The Spot Spitter model tested was the "Light Green Low Flow" (aka "Avocado", part number SS-AG160LGN-100) with a nominal flowrate of 7.2 gph at 25 psi. This was tested both with and without a pressure compensating emitter. The non-pressure compensating Netafim spray-stake (Figure 1) tested was the "Black" (item number 22500-001220) with a nominal flowrate of 7 gph at 20 psi and with an operating pressure of 15-20 psi. The pressure compensating Netafim spray-stake tested was the "Grey" with a flowrate of 6.6 gph, with a double spray pattern and a standard stake mounting option (item number 22500-002230). Both the Primerus and Netafim spray-stakes used the same WPCJL pressure compensating emitter made by Netafim with "CNL" function. The CNL function is a "shutoff valve" feature that turns off the emitter at pressures lower than 2 psi to avoid drainage of the main hose upon shut off.

During the tests, pressure compensating emitters were operating at a pressure between 25 and 55 psi, (the recommended operating pressure on the Netafim PC Spray Stakes brochure is 22 to 55 psi and on the Spot Spitter website is 20 to 60 psi). During the tests, we installed a Senninger 25-psi pressure regulator upstream of the non-pressure compensating spray stakes to lower the pressure to 25 psi. For further testing we swapped the pressure regulator with a 20-psi one. The measured pressure downstream of the pressure regulator was always in accordance with the nominal pressure regulator pressure, 25 or 20 psi. We installed a 150-mesh filter at the beginning of the supply hose as recommended by the spray-stakes manufacturers.

We measured distribution uniformity and flowrate by collecting water in 25 1-gal buckets per each spray-stake tested for 2 minutes. We then measured the volume of water in each bucket with a graduated cylinder. Based on these volumes, we calculated the distribution uniformity of the low quarter. Flowrates were calculated by dividing the average volume collected in the buckets by the run time.

The distribution uniformity measured was on average 0.85 for the non-pressure compensating Netafim and 0.82 for the non-pressure compensating Spot Spitters (Table 1). It was 0.95 for the PC Netafim and 0.95 for the PC Spot Spitters. The measured flowrate at 20 psi was 7.9 gph for the non-PC Netafim and 7.1 gph for the non-PC Spot Spitter; the flowrate at 25 psi was 8.8 gph for the non-PC Netafim and 7.6 gph for the non-PC Spot Spitter. These values are higher than reported by the manufacturer, the Netafim non-PC nominal flowrate is 6.9 gph at 20 psi and the Spot Spitter non-PC nominal flowrate is 6.6 gph at 20 psi and 7.2 gph at 25 psi. The observed flowrate for the PC Netafim was 6.5 gph, slightly lower than 6.6 gph reported by the manufacturer; and 6.1 gph on average for the for the PC Spot Spitters. It is unclear from the manufacturer brochure what is the nominal flowrate for PC Spot Spitters.

The observed distribution uniformity was good for non-PC spray-stakes and excellent for PC spray-stakes (Table 1, Figure 2). As a reference, in overhead sprinkler systems, a distribution uniformity of 0.75 is considered a

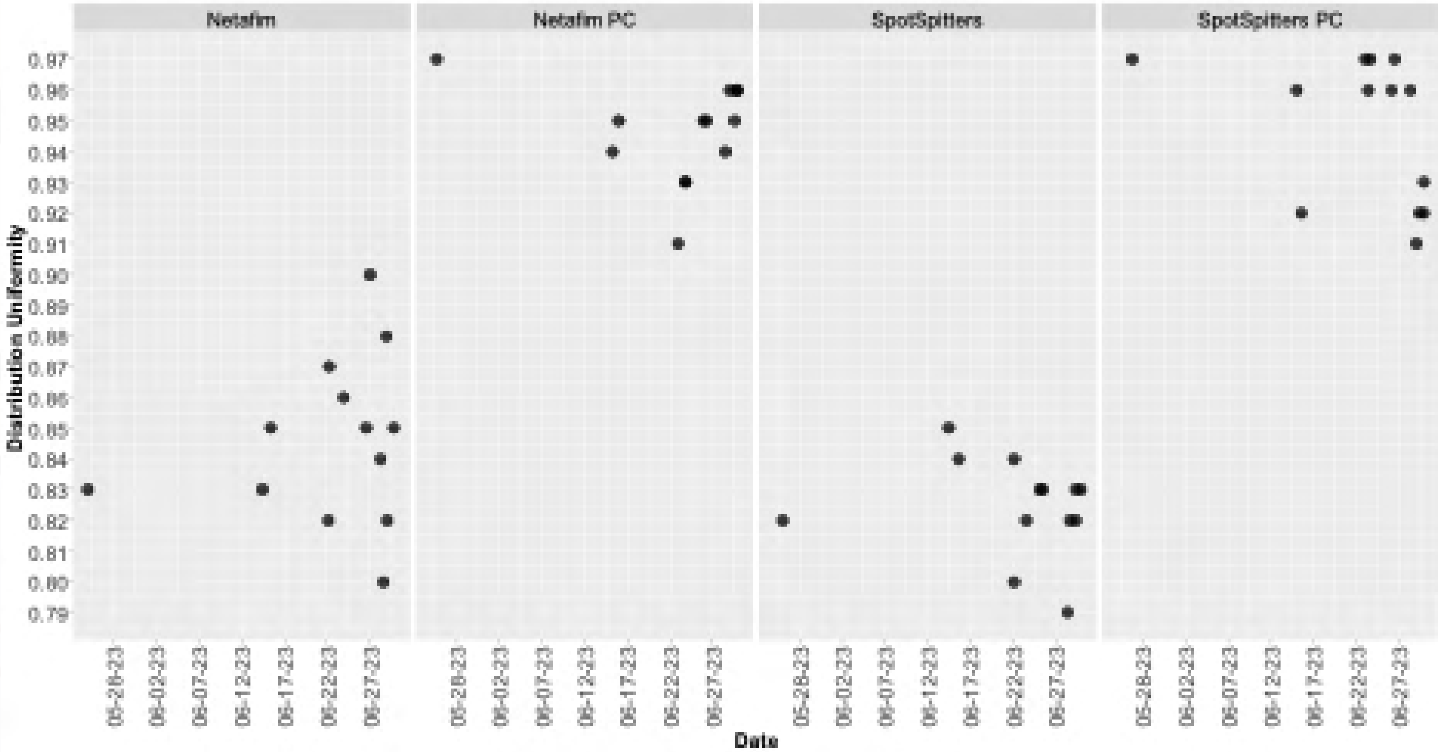

Fig. 2. *Distribution uniformity values measured during the period of evaluation of the spray-stakes.*

good performance. Conversely, in a well-maintained drip system, distribution uniformities in the range of 0.9 to 0.95 are to be expected (Burt and Styles, 2011). In other words, non-PC spray-stakes are a substantial improvement compared to overhead sprinklers, but their distribution uniformity is lower than that of drip irrigation. On the other hand, the distribution uniformity of PC spray-stakes match that of drip irrigation, and the observed distribution uni ave ever measured. The distribution uniformity observed did not vary much from brand to brand, but did vary between PC and non-PC spray-stakes. The pressure compensating feature worked as expected for both brands, resulting in essentially the same flowrate in a wide range of pressures. Conversely, the non-pressure compensating spray stakes showed higher flowrate at 25 psi than at 20 psi as expected.

Is switching to PC Worth it?

Let's say a nurseryman in Escondido is irrigating a 10,000 ft² block of 5-gal containers (10-inch diameter) spaced 20 inches center to center. Each container occupies a space of 20"x 20"= 400 inch² = 2.78 ft², so there are (10,000/2.78) = 3,597 containers in the block. Let's say that the nursery grows year-round, and the nurseryman uses CIMIS to decide how much to irrigate, trying to apply reference evapotranspiration. The average yearly reference evapotranspiration in Escondido is 53.7 inch (California Department of Water Resources n.d.). Since 10,000 ft² is equal to 0.23 acres, the yearly volume used by plants is (0.23 x 53.7) = 12 AcIn = 1 AcFt. In San Diego County, one AcFt of municipal water costs about $2,500.

To apply 12 AcIn of water with a distribution uniformity of 0.82 (non-PC Spot Spitters) one needs to apply 12/0.82 = 14.6 AcIn. However, if applying irrigation with a distribution uniformity of 0.95 (PC Spot Spitters), one only needs to apply 12.6 AcIn. The improvement in distribution uniformity saves the grower 2 AcIn (0.16 AcFt) which amounts to $416.

If the grower switches from non-PC Netafim spray-stakes to PC Spot Spitters, distribution uniformity will improve from 0.85 to 0.95, saving the grower 1.5 AcIn (14.1 − 12.6 AcIn) or $310.

Now let's look at the cost of spray-stakes. A bundle of 100 Spot Spitters PC including the 36-inch spaghetti assembly costs $74, while 100 non-PC spot spitters, including a spaghetti tubing of the same length costs $27, that's $0.47 cheaper than the PC version per unit. So, the grower spends $0.47 x 3,597 = $1,690 more to install pressure compensating spot spitters in a 10,000 ft² block. The savings in water savings will pay off the initial spray-stake investment in $1,690/$416 = 4 years. Netafim non-PC spray-stakes cost $0.20, while the PC assembly costs 0.88. Accounting for $0.10 for the spaghetti tubing, we get to $0.58 difference. The additional cost for the grower is $0.58 x 3,597 = $2086 and the investment pays off in $2086/$310 = 6.73 years.

Bottom Line

In conclusion, our study found that pressure-compensated spray stakes substantially improve distribution uniformity and result in water savings that can lead to better compliance with water quality regulations. However, the current cost of this technology can be cost prohibitive in the short-run for a commercial operation compared to non-pressure compensating spray stakes. The estimated savings resulting from water savings alone may not justify a switch to PC spray stakes, even in areas like San Diego County where the cost of water is extremely high.

Table 1. Summary of results of the spray-stake evaluation

Spray Stake	Distribution Uniformity	Pressure, psi	Flow Rate, gph	Flow Rate, gpm
Netafim 20 psi	0.85	21	7.86	0.13
Netafim 25 psi	0.84	26	8.8	0.15
Netafim PC	0.95	39	6.46	0.11
SpotSpitters 20 psi	0.82	21	7.08	0.12
SpotSpitters 25 psi	0.84	26	7.6	0.13
SpotSpitters PC	0.95	39	6.09	0.10


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Optimizing Avocado Irrigation Management Practices Using Soil Moisture Sensing

Irrigation scheduling is one of the most critical management decisions that affects avocado tree growth, fruit yields and profitability. It is an effective tool to enhance water use efficiency and productivity which not only may result in water and cost savings but also may assist in sustainable future expansion of the avocado industry. Importantly, avocados are very sensitive to overwatering and underwatering and long-term tree health is affected by proper irrigation management. Avocados are mostly grown in coastal California where weather patterns are erratic, and a fixed irrigation schedule can easily lead to improper irrigation management.

Understanding the effects of irrigation events on soil water content provides critical insight for farmers about the present growing environment, the frequency and duration of irrigation events needed, and to maintain adequate soil moisture for avocado trees. There are instances where irrigation events occur too often and for far longer periods than required to reach field capacity (the amount of soil water content held in the soil after excess water has drained away following an irrigation event) in avocado orchards. There are also instances where irrigation events occur improperly, and more frequent irrigations or greater amount of water in some events could improve soil water conditions for healthy tree growth. Soil moisture sensor is a

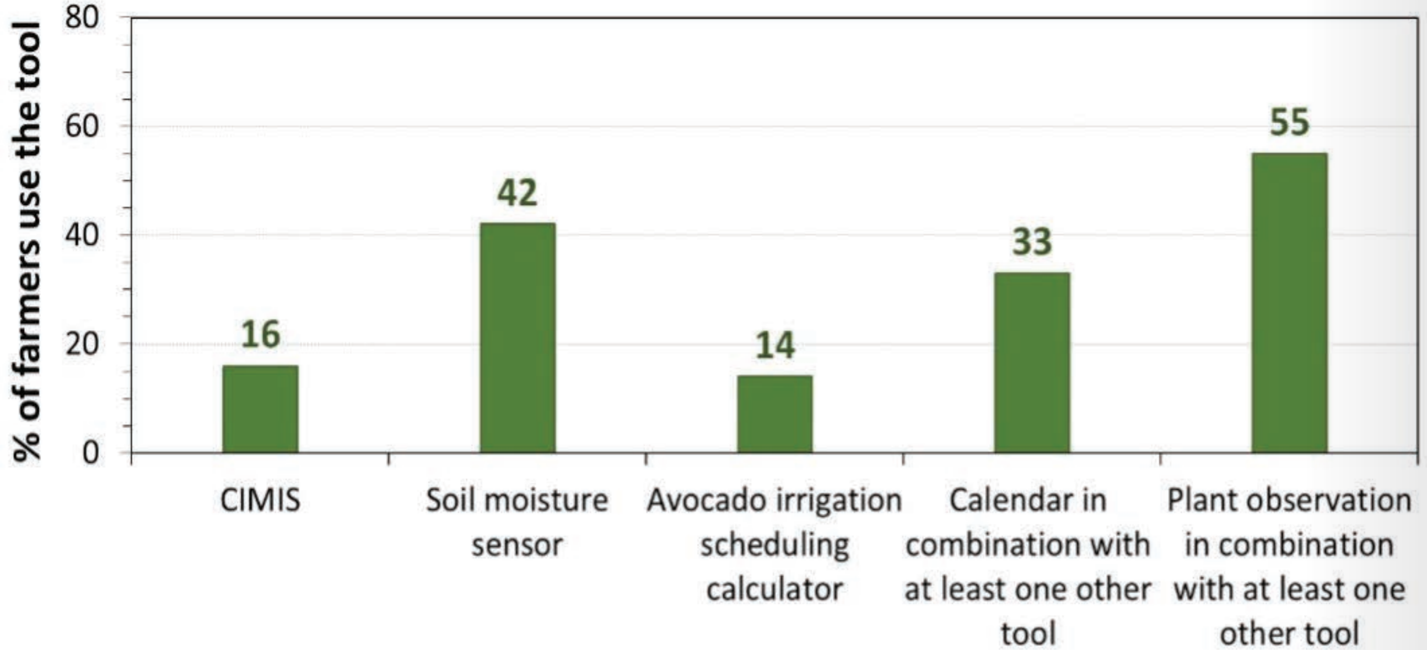

Fig. 1. The percentage of farmers who use different irrigation scheduling tools in their avocado orchards. Results are obtained from our recent avocado irrigation management survey completed by 62 CA avocado farmers.

proven and useful irrigation tool that can provide answer to the following critical questions:

• What is the water status of the soil early in the irrigation season?

• When is the right time for the first and subsequent irrigation events?

• Is the soil profile full after each irrigation event?

• What is the length of irrigation time?

• Should the irrigation practice be changed?

Soil moisture sensors appear to be the most adopted irrigation scheduling tool in California avocados. Nearly 46% of growers who responded to our recent avocado irrigation management survey reported using soil moisture sensors as the key decision-making irrigation tool (Fig. 1). It needs to be noted that avocado growers will also use plant observation and calendar in combination with other irrigation tools including soil moisture, CIMIS (California Irrigation Management Information System: **https://cimis.water.ca.gov/**), and the avocado irrigation scheduling calculator (**http://avocadosource.com/tools/irrigationcalculator.asp**).

Soil moisture sensor selection. An extensive range of soil moisture sensors/probes have already been commercialized and are available to use in avocado orchards. They determine the real-time soil water potential (tension) or volumetric water content and are dominated by a small number of technologies including granular matrix or gypsum block sensors, tensiometers, time domain reflectometry (TDR) sensors, and Frequency Domain Reflectometry (FDR) or capacitance sensors (Table 1 and Fig. 2). Some commonly used soil moisture sensors can be combined with various telemetry devices to access the data through cloud-based data storage applications. Data is automatically uploaded by radio or cell phone communications to cloud-based computer servers and is accessible through apps on smartphones and tablets. These communication advancements greatly improve the convenience of accessing data and can be configured to provide timely alerts when trees require irrigation.

Technology	Measurement (key parameters)	Manufacture
Granular matrix	Soil water potential	Metergroup, Irrometer
Tensiometer	Soil water potential	Hortau, Irrometer, Metergroup
TDR	Volumetric moisture content (and soil temperature and salinity)	Acclima, Campbell Scientific, Metergroup, Environmental Sensors, Spectrum Technologies
FDR or Capacitance	Volumetric moisture content (and soil temperature and salinity)	AquaCheck, AquaSpy, Metergroup, Sentek Technologies, Spectrum Technologies, CropX

***Table 1 and Fig. 2** A summary of commercialized soil moisture sensors*

The results of our avocado irrigation management survey demonstrated that avocado farmers dominantly adopted tensiometer and watermark soil moisture sensors, however, some other sensors such as AquaSpy, Sentek, CropX, Hortau, Meter, and GroundWorx are also used in avocados (Fig. 3). Different types of soil moisture sensors have different accuracies, depending on the sensing technology used and the property of the soil. For instance, the readings of electromagnetic sensors tend to have larger errors in soil with higher clay content. The salinity of soil and/or irrigation water is another factor that can increase sensor error.

While considering the sensors that might work best for your own orchard depending on soil properties and cost (a wide range of less than $100 to more than $300 per sensor plus datalogger/telemetry components and yearly data subscription costs), it is also critical to learn where and how to install and maintain the sensors, and how to interpret and use the data of soil moisture sensors for irrigation management. Most soil moisture sensors have sufficient accuracy, and if properly installed in the right place, they may provide high quality useful data to answer the critical questions mentioned before.

***Fig. 2.** A demonstration of >*

***Fig. 3.** Various soil moisture sensors used in California avocado orchards (Acclima, Watermark, and tensiometer soil moisture sensors and telemetry devices (a & b), CropX soil moisture probe (c), and Metergroup Teros 54 soil moisture probe (d))*

Location of soil moisture sensors. The proper location of soil moisture instrument within the active root zone is quite important. Given the high spatial variability of soils in avocado orchards on hillsides and seasonal changes in root distribution and frequency, both within the orchard and around the trees, the accuracy and representativeness of soil water measurements can be strongly affected.

In selecting the best location for placing a soil moisture instrument, one must consider at least two factors: first, the representativeness of its placement within the orchard, and second, the location around the avocado tree itself. Within the avocado orchard, the ideal situation for instruments is in a homogeneous area that is representative of the orchard as a whole; considering both trees and soil (use soil sampling and/or soil survey tools such as **http://websoilsurvey.sc.egov.usda.gov** to map you soils on the orchard). Having one soil moisture probe per irrigation block could be very beneficial for the effective monitoring of the entire avocado orchard. In addition, around the selected trees, the sensor should be placed at a soil depth and distance from the tree trunk where the highest concentration of root activity is located. The direction, as in the row or between-the-rows, should also be considered, particularly as it relates to the irrigation method being used. Drip irrigation tends to concentrate roots within as many soil wet bulbs as there are emitters, and micro-sprinklers (usually one per avocado tree) concentrate roots in a larger wet bulb, often located between the trees and within the row. The soil moisture sensor should be set up somewhere between the tree and micro-sprinkler, not very close to the tree nor very close to micro-sprinkler.

Soil moisture data triggers irrigation events. The major pitfall of the soil-based irrigation norms using soil moisture probes is that irrigation scheduling is done according to the soil's properties, while the water status of the plant is not considered. An assumption is made that the plant would not stress if soil water content at the effective root zone is kept within the recommended ranges of soil water content, usually field capacity and 50% depletion of easily available water. If the sensor is not in the right place or the avocado root system is not healthy, the measured soil moisture will not truly assess the tree moisture status.

Avocado growers who schedule irrigation based on soil water balance could use a depth of up to 24 in. (called irrigation depth and is recommended to monitor water drained below effective crop root zone of avocado trees), where more than 70 % of roots are found. Data from the sensor installed at 8 - 12 in. depths could be considered as good indication for irrigation management. For instance, those who read the in-field soil water potential from tensiometer and/or watermark sensors may trigger irrigation when soil water potential reaches between – 20 (20 if it is called soil water tension) and – 40 cb at the shallow depth. In order to provide adequate water, irrigation is normally started when the soil dries to -25 cb for sandy soils, or to 40 cb for clay soils. These numbers could be considered greater in late fall through winter when temperature is low, and the water and heat stress are not likely potential issues. This provides optimal water availability that does not restrict plant growth. The amount of available water remaining in the soil profile at this given time determines the need for irrigation.

An interpretation of soil moisture data from avocado orchard case studies.

Half-hourly soil water tension (potential) at 12 in. depth was measured using watermark sensors in two avocado sites, site A with a sandy loam soil texture and site B with a silty loam soil texture (Fig. 4). The data demonstrates that the soil water was maintained within the optimal range in both sites A and B due to the frequent irrigation events, while there was room to optimize irrigation management practices in these avocado sites. For instance, a moderate

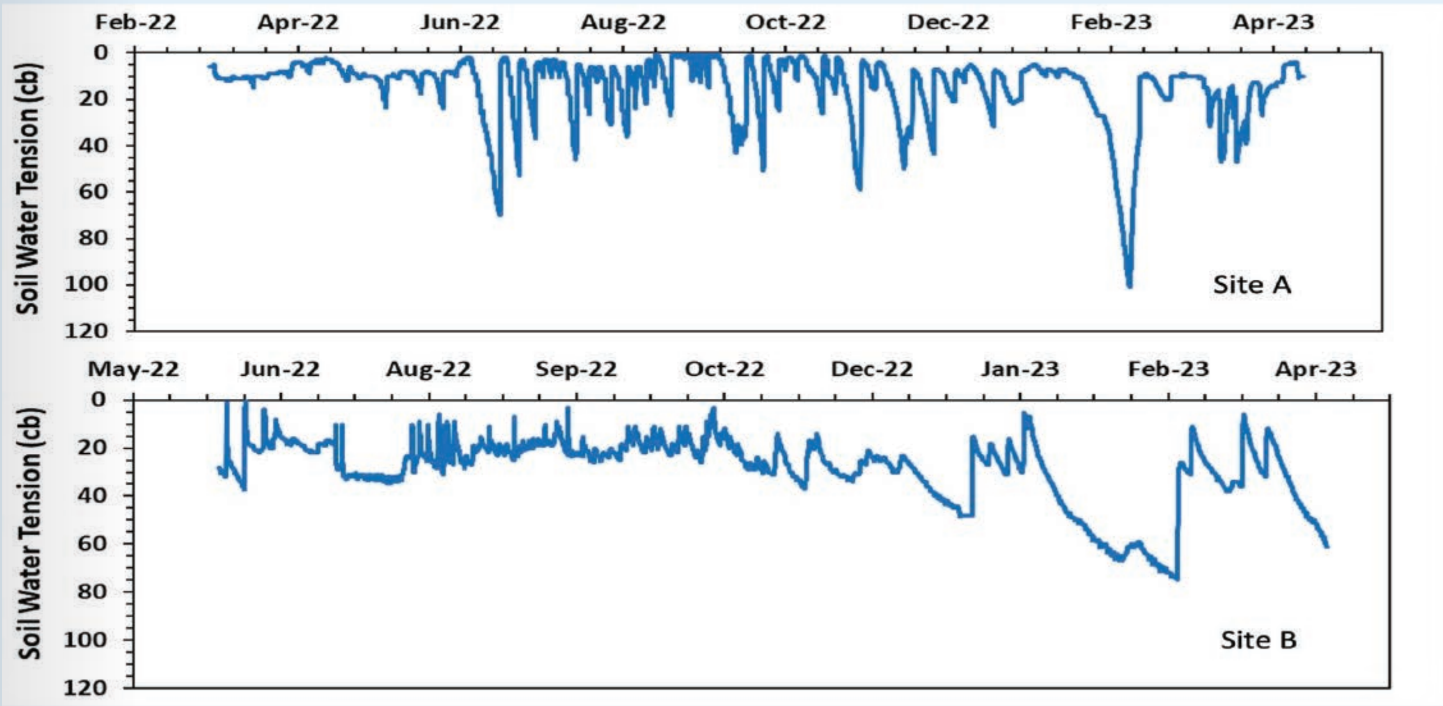

Fig. 4. *Half-hourly soil water tension (centibar) measured using watermarks at 12 in. depth in two different avocado orchards over nearly a 12-month period. Sites A and B have sandy loam and silty loam soli textures, respectively. Soil water tension at field capacity (FC) at site A and B is approximately 12 and 20 cb, respectively. Both sites have micro-sprinkler irrigation systems with a flowrate of 9.5 and 7.4 gallons per hour (per tree).*

water stress could have occurred in mid-June 2022 at site A, when the soil water tension exceeded 70 cb, due to a late irrigation event. Also, scheduling a light irrigation event in mid-February 2023 at site A could benefit avocado trees. Even though considerable precipitation occurred in winter 2023, there was no rain event between late January through February 20, 2023, at this site, and consequently, the soil water tension exceeded 100 cb for a short period of time until new precipitation occurred in the late February.

Site B was occasionally overirrigated during the summer but again one irrigation event in mid-February 2023 could have been recommended for this avocado site as well, to maintain soil water status at a desired level in the late flower bud development growing phase. The soil moisture data indicates that less frequent irrigation events at site B and shorter irrigation runs at site A could be considered in the summer period to improve irrigation efficiency.

A good example of proper irrigation scheduling in avocado orchards is what happened in a 6-month period at site C (Fig. 5). The loamy soil of this site has high water holding capacity and the grower scheduled 10 irrigation events between mid-July and mid-December in the 2023 season. As a result of proper irrigation management at this site, the volumetric soil water content at the effective root zone was maintained at an average of 23.5% over the period. No considerable overirrigation or potential water stress was observed, as soil moisture was adequately maintained throughout the study period.

A few last comments. We need to keep in mind that adopting soil moisture sensors and effectively using them to fully obtain the benefits and optimize irrigation scheduling in avocado groves could be time consuming. Making a habit of having them in avocado groves and looking at their data is likely the most critical step of the adoption process.

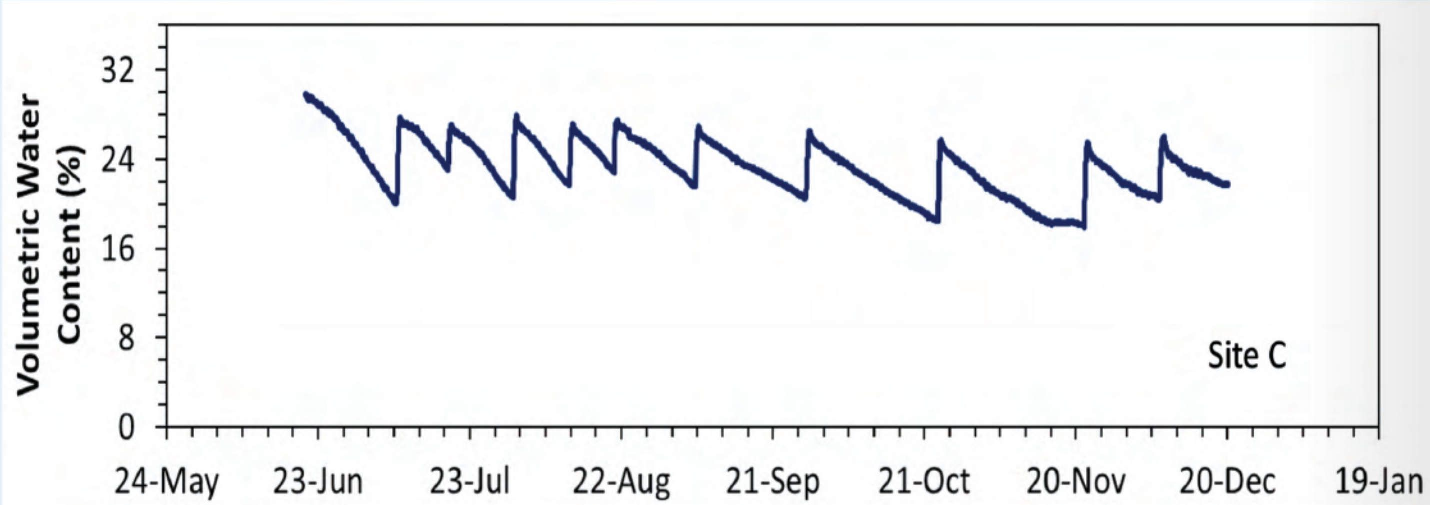

Fig. 5. *Half-hourly soil volumetric water content (%) measured using CropX soil moisture sensor at 8 in. depth in an avocado orchard over a six-month period. The site has a loamy soil texture. Soil water content at field capacity (FC) at site C is approximately 28%. The site has a micro-sprinkler irrigation system with a flowrate of 7.9 gallons per hour (per tree).*

One might be disappointed about the accuracy and the effectiveness of this tool in the beginning, or even find soil moisture data redundant. A learning curve and good approach to effectively adopt soil moisture sensing in avocados could be to: track the data for good quality over a period with several irrigations and/or rain events, accurately interpret the data for the period, implement changes needed in the irrigation practice accordingly, and track the impact for a following short period. Ensure good quality data, learn to interpret the data, and take action(s) for improving irrigation practices if needed!

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Breaking New Ground: UC Master Food Preservers Launch First Spanish-Language Steam Canning Class in California

This summer, UC Cooperative Extension San Diego's Master Food Preservers (MFP) held a class in collaboration with the Olivewood Gardens for the Kitchenistas. The class was the first ever steam canning class conducted in Spanish in the state of California for the UC MFP program. UCCE San Diego's UC MFP team was led by Program Coordinator Marilynn Click, Dom Fiume, Al Manzur, Leah Taylor and Shirley Salado. San Diego has a total of 20 trained and certified UC MFP's and 3 staff members as of 2024. The class consisted of three parts: Food preservation background, vegetable preparation, and steam canning.

The morning started with Shirley Salado and Marilynn Click providing background into who the UC Master Food Preservers are and what they do. The UC MFP's is a public service and outreach program under UC Sustainable Agriculture Research and Education Program (UC SAREP). Through the UC MFP program, the public is able to have access to UC trained food preservers who may provide guidance, lessons or answer questions they may have.

We began our class with principles of food safety to get the students prepared for a morning of food handling. The Kitchenistas were provided gloves, aprons and hair ties; handling ready-made foods requires the use of clean, single-use gloves once hands have been thoroughly washed with soap for 20 seconds. With hair slicked back, hands washed and a clean apron, class was ready to begin.

Click illustrated for the Kitchenista's directions on how to identify a low acid from a high acid food and why we were using a pickling and steam canning combination for the day's class. Fresh from the Olivewood Gardens farms, our class was working with vegetables such as cabbage, carrots, peppers and cucumbers, examples of low acid foods. Low acid foods intended to be canned need temperatures high enough to kill all micro-organisms, as they do not have a natural acidity to kill microorganisms for them. Students were then instructed to work together at their table to chop all the vegetables provided into evenly sized quarters. Once all groups completed their chopping, we moved inside to the Olivewood Gardens large demonstration kitchen to begin the filling of jars and steam canning phase.

Steam canning is an environmentally friendly and energy efficient relative of the water bath. It uses significantly less water than the water bath and reaches the required temperature required for killing bacteria and thus, safely canning much faster; saving on water and energy. Our

Master Food Preserver Program Coordinator Marilynn Click, pictured leading the first steam canning class conducted in Spanish in California.

steam canning was paired with a hot pickling brine, prepared by UC MFP's Dom Fiume and Al Manzur.

With the prepared chopped vegetables, students were instructed to begin raw packing their vegetables into the provided jars. Raw packing, according to this recipe, consisted of filling the jars tightly with the assorted vegetables leaving one inch of headspace including the brine solution. The MFP team went around measuring to check that each individual jar was both packed tightly and left with that one inch of headspace. Once the jar was packed and filled with the hot brine, students worked on removing any remaining air bubbles from their jar while they awaited everyone else to finish this portion.

As a class, we all waited for 15 minutes while the jars processed in the steam canner. The class was in the home stretch and students were beginning to feel especially excited about their prepared jars and began brainstorming what recipes they would add to it once it was ready. After the required waiting time of 24 hours passes, the students will be able to take their freshly

processed pickled vegetables home but will still have to wait for 6 weeks before using. Many students agreed that it would make a great flavor and spice addition to a torta, while others wanted to try it in its traditional use and add it on top of fish.

The Kitchenistas were the first group in California to receive this class in Spanish. Luckily, research-based recipes are becoming more popular to be offered in multilingual translations. The UC MFP's only suggest using recipes that are research-based when it comes to food preservation. Safety is of utmost importance when it comes to food consumption and canned, fermented, or pickled foods should always be supported with a recipe and UC MFP guidance prior to beginning.

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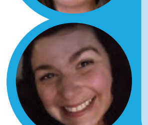

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Garden Tips and Master Gardener Training: What You Need to Know

As the summer heat fades and September rolls in, it's the perfect time to shift focus to preparing your garden for the cooler months ahead. Our UCCE Master Gardener Program of San Diego County has some timely tips to help you make the most of this transition.

September Gardening Tips:

Plant Cool-Season Crops: Fall is an ideal time to plant vegetables that thrive in cooler temperatures. Consider sowing seeds for lettuce, spinach, kale, radishes, carrots, beets, and peas. These crops will flourish as the weather cools down.

Adjust Watering Practices: Despite the cooler temperatures, Southern California remains dry. Be mindful of your irrigation practices to avoid overwatering and conserve water. Mulching around your plants can help retain soil moisture and regulate soil temperature effectively.

Master Gardener Training Class of 2020 Featuring Master Gardener volunteer Heather Holland, at the UC Cooperative Extension office

Monitor for Pests and Diseases: Fall can introduce new challenges for your garden. Regularly inspect your plants for pests and diseases and address any issues promptly to keep your garden healthy and thriving.

Become a Master Gardener!

With a dedicated team of over 300 volunteers, our Master Gardeners reach every corner of San Diego County, offering valuable gardening insights and support. But who are these, Master Gardeners? They are volunteers trained and certified by the University of California Cooperative Extension (UCCE), providing county residents with research-based information on home gardening, horticulture, and pest management.

Training for New Master Gardeners:

The next Master Gardener training course starts in January 2025. This comprehensive program consists of approximately 18 classes held every Tuesday from January through June at the County Operations Center on Overland Ave., San Diego. Topics include botany, soils, irrigation, entomology, plant pathology, weed management and more. A class fee covers textbooks and other materials.

To earn certification, students must complete the course, pass a final exam with a score of 70% or better, and agree to complete at least 50 hours of volunteer service in the first year. Afterward, certified Master Gardeners commit to 25 hours of volunteer service and 12 hours of continuing education annually.

Interested in Joining?

The selection process begins with a public interest meeting where you can learn more about the program and how to apply. Space is limited, and we often receive more applications than available spots. A selection committee will review applications, conduct interviews, and recommend candidates for the training class.

Don't miss this opportunity to enhance your gardening skills and contribute to your community. Apply before September 30th to secure your spot in the 2025 Master Gardener class. For more details and to apply, visit:

https://www.mastergardenersd.org/2025-class/

Happy gardening, and we look forward to seeing you in the Master Gardener program!

ABOUT THE AUTHOR

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Meet the Team

Get to know the people behind Cooperative Extension San Diego!
Each issue we like to highlight some members of our amazing team.

Meet our Advisor

Derrick Robinson, Phd.
Urban Agriculture, Food Systems and Environmental Issues Advisor

Derrick Robinson joined UC ANR on July 1, 2024, as the Urban Agriculture, Food Systems, and Environmental Issues Advisor for San Diego County. Before this role, he was a Senior Researcher and Policy Advocate at the Center on Policy Initiatives, where he worked on local policy initiatives with regional coalitions focused on economic and climate justice for workers, families, and communities. He also served as an Aquaculture Economist for NOAA, providing research on government interventions aimed at increasing aquaculture in Southern California and the Gulf of Mexico. Derrick has also been a research economist and professor at the University of San Diego, University of North Florida, and Tuskegee University.

Dr. Robinson earned his Ph.D. in Applied Economics from Auburn University, where he was a NOAA collegiate fellow, with research focusing on marine resources and resilient coastal communities. In his current role, he is excited to continue focusing on improving the sustainability of the region's food system, particularly in communities that have been historically underinvested in food resources and infrastructure. He believes research should bridge to policy, helping officials understand the impact of their agendas and ensuring communities have the resources to advocate for a sustainable food system and improved economic welfare.

Meet our Staff

Sabina Padilla
Community Education Specialist 2

Sabina Padilla recently joined the Expanded Food and Nutrition Education Program (EFNEP) team as a Community Education Specialist 2. She was born and raised in Davis, CA, where growing up surrounded by the UC Davis community encouraged her interest in agriculture and science.

Before UC ANR, Sabina earned her B.S. in Physiology with a minor in Philosophy from San Francisco State University. During her time in San Francisco, Sabina discovered her love for community education while working at The Jamestown Community Center, a youth-development organization and afterschool program. She began as a Kindergarten teacher and Family Support Services Facilitator and upon graduation, she began managing all program offerings for her school's site.

Sabina has a wealth of experience in planning curriculum for K-6 students, collecting and reporting program data, and collaborating with schools and community partners. She's thrilled to combine her passion for science and education at UCCE San Diego, where she looks forward to connecting San Diego's communities with the EFNEP program.

Calendar

2024

Stay up-to-date with seminars, webinars, trainings, events, and more!

SEPTEMBER

UC MASTER GARDENER PLANT SALE
September 21st, 9:00AM to 3:00PM
Balboa Park, 1650 El Prado, Room #101

LAST WEDNESDAY GROWERS MEETING: HOW TO FUND CLIMATE SMART PRACTICES
September 25th, 7:30AM to 8:30AM
420 S. Broadway, Escondido and Virtual

OCTOBER

4-H BOARD OF SUPERVISORS PROCLAMATION MEETING
October 8th, 8:40 AM
1600 Pacific Highway, San Diego, CA

LAST WEDNESDAY GROWERS MEETING
October 30th, 7:30AM to 8:30AM
420 S. Broadway, Escondido and Virtual

SOUTH AMERICAN PALM WEEVIL WORKSHOP
October 22nd, 8:00AM to 12:00PM
Sweetwater Summit House
3218 Summit Meadow Road, Bonita, CA

Extension Connection

We hope you have enjoyed this issue of the Extension Connection!

We will continue bringing you the latest news from UC Cooperative Extension San Diego, and we would also like to hear from you.

What Do You Think?

TAKE OUR SURVEY

Please consider subscribing to this quarterly newsletter and following us on social media!

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