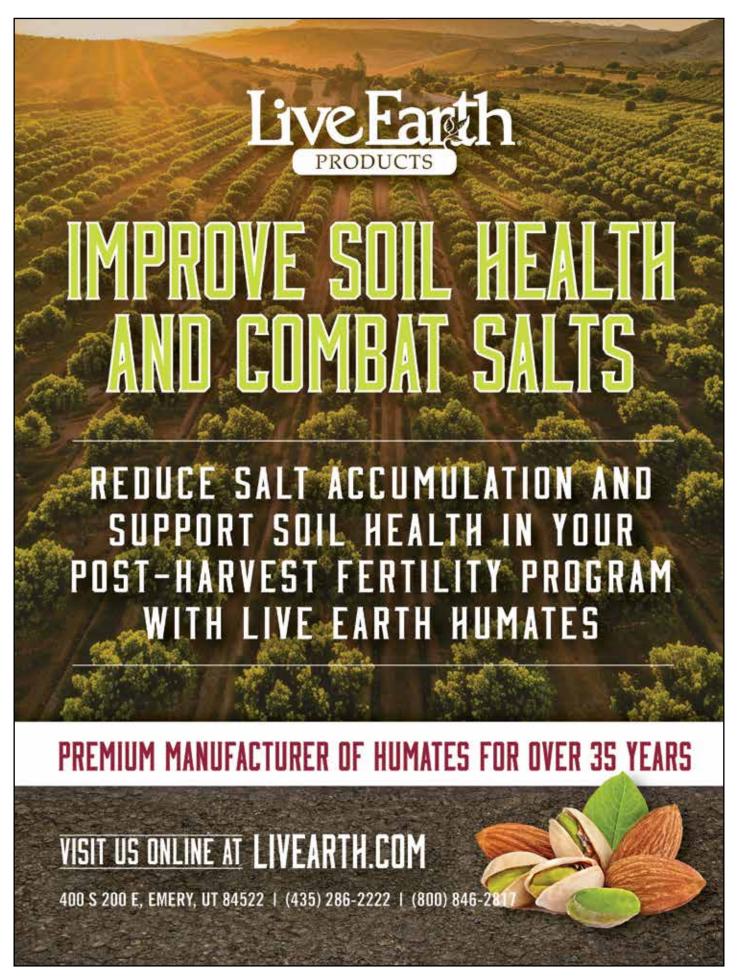
## California Farm Equipment Magazine

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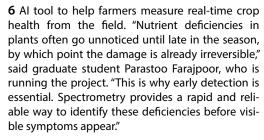
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## Al-powered irrigation system offers opportunities for communications, farming



The project includes one test bed served by an Al system and one watered traditionally. Photo courtesy of Farms to Incubators

By Patty Guerra

UC Merced, UC ANR partner to test Al-guided watering of almond orchard at Kearney REC

An almond orchard in Parlier provides a look into the future of farming.

Researchers at University of California, Merced and the University of California Agriculture and Natural Resources installed an irrigation system powered by artificial intelligence to deliver the precise amount of water needed and measure the results.

Led by UC Merced computer science and engineering Professor Wan Du, the project was funded through the Fall 2023 Climate Action Seed Funds. It included a goal that's almost as important as the work itself: spreading the word about the system and its potential.

The project includes two test beds: one irrigated via traditional methods and one served by the Al-powered system. Du is working alongside UC Merced civil and environmental engineering Professor Safeeq Khan, a water resource management and soil science expert and Agricultural Experiment Station faculty member who built the soil model for the project. They also are partnering with computer science and engineering Professor Stefano Carpin, who developed the Al model.

"We will compare how much water each test bed will use," Du said, "and then compare the production and result of these two fields."

The system measures how much moisture is in the soil, then the potential for movement of water through a tree and eventually out the leaves. The data is uploaded to the internet.

"We have sprinklers under almost every tree so we can control them," Du said. An algorithm processes the data and determines whether to open a sprinkler and how long it should run.

"We want to save as much water as we can," Du said. "Saving water will reduce the cost to growers, and we can save the natural resource for the next generation."

The system will be operational next spring, when the trees start to flower.

Image

The project includes one test bed served by an Al system and one watered traditionally

The project includes one test bed served by an Al system and one watered traditionally. Photo courtesy of Farms to Incubators

A group of students working with the nonprofit From Farms to Incubators.is sharing the news about the AI system. Amy Wu, founder and chief content director, developed a program to teach students how to effectively communicate agriculture technology.

Starting last September, the students learned digital storytelling, communicating science and documenting the work of Al.

"We also have a guest speaker series where they have been able to connect with rock stars in ag tech," Wu said.

Wu came to UC Merced and met with the professors, then went to the farm at the Kearney Agricultural Research and Extension Center, operated by UC ANR in Parlier, to see the system and document the work.

"We created a menteeship program where students are learning about journalism and communications and also ag tech," Wu said. "We trained them on interviewing and writing, to document the journey of the Al-generated crop irrigation system."

They created a package of stories, photos and videos aimed at a broad audience from consumers interested in innovation to farmers seeking help tackling climate change.

Two of the students were undergraduates from UC Merced and a third was a recent graduate from California State University, Monterey Bay. All brought their own experiences and technical knowledge to the project. They developed new skills in writing and editing and connected with speakers representing women in agricultural technology.

Anvi Kudaraya, a UC Merced computer science and engineering undergraduate student from Pleasanton, said she learned the system architecture to get a deeper understanding of the sensors in the field, the Al irrigation model and data visualization. She wrote Python scripts to process real sensor data, which she said taught her "how to handle messy,

See Al powered irrigation page 9

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## Al tool to help farmers measure real-time crop health from the field

By Emily Dooley,

UC Davis College of Agricultural and Environmental Sciences

Leaf Spectrometry App Predicts Nutrition and Stressors

Leaf Monitor, a new mobile tool backed by artificial intelligence and predictive modeling, could revolutionize how farmers monitor crops and make decisions by providing real-time nutrition and leaf trait information in the field.

"Having this information is very valuable for the farmers," said Alireza Pourreza, associate professor of Cooperative Extension and director of the Digital Agriculture Laboratory in the Department of Biological and Agricultural Engineering at the University of California, Davis. "In five seconds, they can have a sense of how much nutrition they have in a leaf."

Development of the AI model was funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture's HiRes Vineyard Nutrition multistate project and its Animal and Plant Health Inspection Service, as well as the California Table Grape Commission.

Maha Afifi, director of viticulture research at the California Table Grape Commission, said the tool could be a game changer for the table grape industry if it leads to faster decision-making about fertilizer use. The right amount typically leads to healthier vines that produce more grapes with optimal size, weight and color.

"The evaluation of vine nutrient status is one of our top priorities," Afifi said. "At the same time, exploring new technology tools like this project is a high priority for us because they will be important to the future of the table grape industry."

#### Field testina

The Leaf Monitor tool uses a handheld spectrometer to measure leaf reflectance beyond the range of light visible to the human eye.

Once a leaf is scanned, its spectral data is uploaded to a cloud-based machine learning system designed to predict leaf traits and nutrient content. This algorithm was developed and trained by the Digital Agriculture Laboratory over five years using a dataset of thousands of leaf samples collected from California's specialty crops, primarily grapevines and almonds. The samples were chemically analyzed to determine nutrient levels and structural leaf traits, providing the data needed to build an accurate prediction model.

"Nutrient deficiencies in plants often go unnoticed until late in the season, by which point the damage is already irreversible," said graduate student Parastoo Farajpoor, who is running the project. "This is why early detection is essential. Spectrometry provides a rapid and reliable way to identify these deficiencies before visible symptoms appear."

After a recent demonstration, Bullseye Farms irrigation manager Geoff Klein said the tool could help save money and improve yields. Bullseye grows walnuts, pistachios, tomatoes, corn, wheat, rice and sunflowers in Yolo and Solano counties.

#### Tailored crop management

Currently, farmers typically take leaf samples, dry them, grind them up and send the samples off to a lab for testing, which can take up to two weeks to return results. Bullseye samples leaf tissues about three times a year.

"Right now, it doesn't really make sense to go out and take tissues in every single corner just because it's expensive," Klein said. "It'd be really cool if I could just walk out there and test a couple of different places."

The Leaf Monitor tool helps farmers tailor management decisions to specific areas rather than an entire field. Calibrating fertilizer use to real-time data can prevent overuse and nitrogen runoff, a financial and environmental challenge that many growers face.

"I feel like there's a lot of times we do need to put less [fertilizer] on, where we end up putting more, because that's what the nitrogen removal formula says," Klein said. "But with this app we can use less because we know the actual conditions at the time. I think it opens a lot of doors in terms of getting data back in real time and also utilizing the level of control we have with the data."

The app can also aggregate the scans and map out spatial patterns over a large area.

"What we know is every field has variability that is not necessarily visible to the farmer's eye," Pourreza said.

The prototype Leaf Monitor tool is free and included in a set of tools that can be downloaded on the Digital Agriculture Laboratory website. A web-based version of the tool will follow while the team continues to feed new data into the algorithm to refine the predictions. On average, it achieves about 65% accuracy across all traits, with predictions for certain nutrients, such as nitrogen and phosphorus, performing better than the overall average. Users will need to pair it with a spectrometer.

"We need to produce more food while using less resources so we need to have some kind of monitoring system to give us precise and accurate feedback on our management practice," Pourreza said. "This technology is growing very fast."



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## The Climate Resilience Strategy for California Agriculture is out for public review

#### Please provide public comment by November 7, 2025

CDFA encourages stakeholders, including farmers, ranchers, technical assistance providers, and the public, to review the draft guidelines and submit feedback during the open comment period.

The California Department of Food and Agriculture (CDFA) has just released the draft Climate Resilience Strategy for California Agriculture (RSA) for public comment. As California farmers and ranchers are facing an increasingly difficult landscape, including climate change effects, economic uncertainties, and more, the state is dedicated to supporting our agricultural industry and food system. This document is a key step in ensuring that the state is fostering resilience in the agricultural sector.

The RSA lays out the current challenges facing our agricultural system and what the state is already doing – including investing in tools and innovations, developing and administrating programs, offering technical assistance – and highlights where there are opportunities for the state to do more.

The RSA was developed with input from farmers and ranchers, nonprofits, technical experts, state agencies, and more. Now, CDFA is asking for public comment to ensure that the topic areas, goals, strategies and actions reflect stake-



holder input and needs.

Here is how you can read and provide feedback:

Visit https://communitydocument.com/view/rsa to read the Climate Resilience Strategy and leave comments.

Download the RSA at www.cdfa.ca.gov/climate and email climate@cdfa.ca.gov to share your comments.

For any direct questions, please contact Nina Bingham at climate@cdfa.ca.gov. Please share this information with your friends, co-workers, and neighbors!

Public comment ends on November 7, 2025 — make sure you provide your feedback before then.

#### Al-powered irrigation

continued from page 4

real-world datasets and prepare them for machine learning models."

Beyond the technical side, Kudayara said, she learned the value of collaboration and communication in research.

"I learned how important it is to connect technology to a broader purpose, especially when the work can impact something as essential as water use in agriculture."

She said the project pushed her to step into areas outside her comfort zone, writing and revising the project article for publication and visiting the farm to document the work through photos.

"I came away with a stronger appreciation for how AI in agriculture is not only a technical challenge, but also a human one, requiring communication, community engagement and clear storytelling to make the technology meaningful and scalable."

For a pilot program, Wu said, "I thought it went very, very well. We went into this not knowing what to expect, but we wanted to expose young people to the possibilities of communicating food and farming."

Savio Jabbo, a computer science and engineering major from San Diego, said being able to see the cutting-edge research and experience the real world applications is amazing to say the least.

"Usually the work that goes into these projects goes unnoticed," Jabbo said. "But when you see the impact that it has even on such a small scale, it feels like the whole world should know about it."

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## **Perennial Weed Issues in Vineyards**



Joy Hollingsworth, UCCE Table Grape Advisor for Tulare and Kings Counties

Weed control is important in all vineyards because weeds can compete with vines for water, nutrients, and sunlight. This is especially critical in the first three years of vine growth. Weeds can also reduce irrigation efficiency, attract and harbor pests, increase humidity, and create a nuisance for labor operations. Perennial weeds are especially difficult to control

because although they may die back during the winter, they can survive and even reproduce through their underground stems (rhizomes).

Some of the most important perennial grass weeds in San Joaquin Valley vineyards are Bermudagrass, Dallisgrass, and Johnsongrass. Bermudagrass forms dense mats with creeping stems (stolons) that root at their joints. It can reproduce by seed, stolons, or underground rhizomes. Disking will expand its population by breaking up and spreading the stolons and rhizomes. Dallisgrass forms loose bunches which are one to five feet tall. It can reproduce by seed and has shallow rhizomes. Johnsongrass is related to sorghum, and its seedlings look similar to corn. It grows in spreading, leafy tufts and sprouts tillers from its base. Johnsongrass is a noxious weed that can reach up to eight feet tall. It reproduces by seed (up to 400 seeds per panicle) and through its rhizomes, which can be extensive. Individual plants can produce 200-300 feet of

new rhizome growth.

Other important perennial weeds include silverleaf nightshade, field bindweed, and yellow nutsedge. Silverleaf nightshade is difficult to eradicate once it's established. Mature plants can be one to three feet tall and have many branches. It has silvery green lance-shaped leaves with wavy edges. The flowers are deep violet to blue with yellow centers and produce berries that start green and then turn yellow to brownish orange. Each plant can produce hundreds of berries with 24-250 seeds each. Reproduction can be by seed (which can remain viable in the soil for up to 10 years) or root fragments. They can also produce new plants growing from their extensive lateral roots.

Field bindweed is one of the most problematic agricultural weeds. It is drought tolerant and has very deep roots. Root fragments can regrow after shallow tillage even when the soil is dry. It is climbing and competitive. It looks similar to Annual morning glory, but field bindweed has smaller flowers which are pinkish white while morning glory has larger dark purple, blue, or pink flowers. It is a prolific seed producer (up to 550 seeds per plant) and the seeds can remain viable for up to 60 years.

Yellow nutsedge resembles grass, but sedges have V-shaped rather than flat leaves. It reproduces by tubers or seeds. It can resprout in moist soil that has been shallowly tilled. Dense populations of nutsedge will aggressively compete with other plants and it is difficult to control once established.

See https://ipm.ucanr.edu/PMG/weeds\_intro.html for more info about these weeds.

To get more information about table grapes, consider attending the Southern San Joaquin Valley Grape Symposium on Friday, February 6, 2026. Contact joyhollingsworth@ucanr. edu to be added to the grape newsletter/event announcement email list.



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### California AgTech Alliance launches to help farmers stay competitive

\$15 million collaboration to fast-track innovation, workforce development and economic growth



Karen Aceves, founder of ARKEN Strategies; Karen Ross, secretary of the California Department of Food and Agriculture; and Gabriel Youtsey, UC ANR chief innovation officer spoke at the California AgTech Alliance launch on Oct. 22. Photo by Michael Hsu

California has launched the California AgTech Alliance, a \$15 million statewide initiative designed to transform how agricultural technology moves from lab to field.

Announced at FIRA USA, the Alliance brings together the University of California Agriculture and Natural Resources (UC ANR), the California Department of Food and Agriculture (CDFA), and the Governor's Office of Business and Economic Development (GO-Biz).

The Alliance will coordinate nine regional innovation hubs that will deploy cutting-edge technology, train the next generation of agricultural workers and attract millions in private investment to California's \$50 billion farming economy.

"The California AgTech Alliance gives us a statewide platform to connect research, industry and farmers in a more coordinated way," said Gabriel Youtsey, chief innovation officer at UC ANR. "UC ANR's role is to convene, to build the bridges between regions, producers, innovators and government that help good ideas scale up. This is about collaboration at every level, so the technologies developed here deliver real impact in the field."

"Agriculture has always been the backbone of California's economy and our way of life," said Karen Ross, secretary of CDFA. "As producers face climate change, water scarcity and other production challenges, innovation becomes essential. The Alliance ensures farmers of all sizes, especially small and mid-scale operations, have access to the tools and partnerships that keep them productive and sustainable."

The Alliance tackles the full life cycle of agricultural innovation, from moving technology out of the lab and onto farms, to training workers who can operate and maintain these systems, to coordinating regional ecosystems that attract investment and scale solutions statewide. It operates through three strategic pillars:

Ag Tech Deployment & Commercialization: The Alliance will help accelerate the path from prototype to production by connecting startups and researchers with growers, test sites and regulatory support. This includes a statewide network of field demonstration hubs that enable companies to pilot

technologies in real-world conditions, along with \$2 million in innovation grants to support commercialization and adoption.

Workforce Development & Training: Through programs like the Farm Robotics Challenge and Academy and AgSTEP, along with partnerships with colleges and universities, the Alliance will expand training for both new and seasoned farmworkers. The goal is to prepare Californians for the growing demand in high-skill ag tech jobs, combining technical training, digital literacy and hands-on learning to ensure that the benefits of innovation reach every community.

Regional Collaboration & Investment: Spanning nine regional innovation hubs, from the North State to the Imperial Valley, the Alliance will coordinate research, entrepreneurship and capital across California's diverse agricultural landscape. This regional structure ensures that innovation is both locally informed and statewide in impact, promoting inclusive growth through the California Jobs First framework.

"Technology isn't the bottleneck, adoption is," said Walt Duflock, senior vice president of innovation at Western Growers and co-chair of the Alliance's Industry Advisory Board. "Growers need proof these tools work, training to use them and confidence they'll deliver ROI. The Alliance removes those barriers by putting industry at the center of development, ensuring we build solutions farmers will actually use."

Training people to use the new tools will be a key to success.

"You can't have agricultural innovation without investing in people," said Karen Aceves, founder of ARKEN Strategies and lead for the AgSTEP Workforce Program. "The Alliance creates pathways for Californians, including those in underserved communities, to access high-wage, high-growth careers. We're building a diverse, skilled workforce that can support this industry for decades."

The Alliance's statewide reach is powered by a diverse network of more than 50 partner organizations spanning every major agricultural region. Regional implementation is led by organizations including the Monterey Bay Economic Partnership, F3 Innovate, Building Healthy Communities-Kern, and California State University San Marcos, working alongside regional alliances like the Salinas Valley AgTech Alliance, Merced AgTech Alliance, and North State-Redwood Coast AgTech Alliance.

Community colleges, UC campuses including UC Davis and UC Merced, workforce development boards, and community-based organizations ensure training reaches every corner of the state. The Alliance's 13-member Industry Advisory Board – representing leading growers and agricultural associations from specialty crops to tree nuts – provides direct input from the field, ensuring technologies and programs meet real farming needs.

The Alliance is part of the California Jobs First initiative, a statewide effort to strengthen regional economies, encourage innovation and ensure an inclusive transition to a climate-smart, technology-driven future.



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## **Unlocking New Value: Commercializing Almond Hulls as Food Ingredients**

Historically used for dairy cattle feed, almond hulls have had a consistent place in the animal nutrition space. However, a declining dairy herd, in combination with hulls being traded below their production cost, has propelled the industry and the Almond Board of California (ABC) to think about alternative revenue-generating opportunities.

Helping lead this charge is ABC's Biomass Working Group, formed in 2017 to explore new applications for almond co-products.

"This biomass working group is where business meets science," said Michael Kelley, chairman of the committee and president of Central California Almond Growers Association (CCAGA). "We have become exceedingly appreciative of the ideas and the potential for the commercialization of products using almond hulls."

**Nutrition Potential** 

One area almond hulls have shown strong potential for is human food products. Because of their high fiber content, natural sugars, phytochemicals, minerals, and processing versatility, they offer multiple benefits in the value-added ingredients food space.

Being that they make up 50% of the almond fruit, they are also abundant in California, creating a reliable and readily available supply for large-scale product development.

While some may guestion their safety for human consumption, there are positive indicators that prove almond hulls can meet food-grade quality standards. ABC Associate Director of Food Research and Technology, Guangwei Huang, noted that almond hulls have long been used safely in livestock feed, with no negative effects on animal health or performance. Studies have also shown that pesticide residue and toxicity exposure are not a concern.

To explore these possibilities further, ABC partnered with Mattson, a product innovation firm, to develop samples of what could be done with hulls.

These included a high-fiber bar made with 15% almond hulls, delivering five grams of fiber per serving, and a coffee beverage crafted from coarse-ground, roasted hulls. When added to coffee, almond hull powder helped reduce bitterness and enhanced sweetness. In baked goods like bread, it boosted both fiber and phytochemical content.

Opportunity in "Upcycled" Markets

Another advantage almond hulls offer is that by adding just 10% or more of almond hull powder to a product, it can qualify for a new third-party "upcycled" certification. While "upcycling" is a relatively new term, it's become increasingly important to consumers concerned about food waste, noted Daniel Kurzrock, founder and CEO of Upcycled Foods.

After working with upcycled ingredients across various commodities, Kurzrock said he's seen firsthand the wide-ranging benefits. These include improved sustainability and circularity, the creation of new revenue streams, reduced disposal costs and stronger alignment with shifting consumer values.

"The almond industry is not alone in seeing this potential," he said. "There's profit potential for every aspect of the stakeholder chain if we're able to create uses that are solving problems for companies that buy ingredients."

Because the end-market for almond hulls is still being widely explored, he also suggested that at this stage in development, it's important to initiate customer conversations before deciding what to invest in.

"An approach that we find to be working with other materials is doing a pilot to produce some quantity of viable hulls that can go to a miller or a secondary processor to start those customer conversations," he said.

Steps for Commercialization

While it's not realistic to expect the hulls to be process-ready when leaving the huller/sheller, Huang said efforts to clean and improve their quality can still make a significant impact.

"When the time comes, the industry needs to set minimal specifications or quality requirements for almond hulls for food uses," Huang said. "We are trying to minimize foreign material, and most importantly, we need the involvement and attention of stakeholders. We're not expecting the huller/ seller to get hulls to the ready-to-process stage, but they can minimize those foreign materials down to less than 5%."

The industry must also complete a GRAS (Generally Recognized As Safe) assessment for human consumption, a requirement mandated by the Food and Drug Administration since hulls haven't previously been used as a food ingredient. This assessment is expected to be completed by late 2025, Huang said.

Innovations in Processing

Several companies in the almond industry are already investing in hull-cleaning systems to ensure they are ready for when almond hulls receive food-safe approval. One of those pioneer companies is Cortez Growers Association.

Recognizing almond hulls as a potential revenue stream, Cortez implemented a cleaning system to remove unwanted materials – sticks, shells, and almond meats – that typically end up in the hull pile. By separating these components, they could sell the almond meats as hash, a "refreshing benefit" to add value to what was once considered waste, said general manager, Dave Thiel.

Other processors are also refining their methods. Corbin Sturdivan of Wilkey Industries explained that current hull cleaning systems include an aspirator to remove the shell from the hull and a detwigger deck to remove sticks from the

"While this has worked for many years to reduce the fiber content for dairy feed, there is more refinement that we can do with this system by introducing additional screening and additional aspiration," Sturdivan said.

Through their trials with ABC, Sturdivan and his team discovered that by adding a screen to sift through the hulls, they See Almonds Hulls page 19





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## **New Study Shows Eating Pistachios Daily Can Support Eye Health**

2 daily handfuls of pistachios may help protect the eyes from blue light damage and could reduce the risk of age-related vision problems.

Could 2 handfuls of pistachios a day help protect your eyes as you age? A new study from Tufts University says yes.1 The research found that eating just 2 ounces of pistachios every day may significantly improve eye health by increasing levels of a key antioxidant that helps protect vision.

The study, led by researchers at the Friedman School of Nutrition Science and Policy at Tufts University, showed that pistachios, which have measurable amounts of a plant-based pigment called lutein,2 can help increase macular pigment optical density (MPOD). This important part of the eye filters harmful blue (visible) light and protects against age-related macular degeneration (AMD), which is one of the leading causes of blindness in older adults.

Findings from this research are timely, as according to a national poll by the American Foundation for the Blind, Americans fear vision loss more than they fear other serious health problems.3

What the Study Found

Better Eye Health in Just 6 Weeks: Middle-aged and older adults who were otherwise healthy and ate 2 ounces (about 2 handfuls) of pistachios every day saw significant increases in MPOD after only six weeks.

Provides Antioxidant Lutein: Pistachios are the only nut with measurable amounts of lutein, an antioxidant and blue light filter that may help protect eyes from light damage and supports long-term vision health. In the study, lutein intakes nearly doubled and blood lutein levels were significantly elevated.

Age-Related Vision Protection: The study suggests that pistachios could be a simple, natural way to help reduce the risk of AMD, a serious eye condition that affects millions of people as they get older.4

"Our study shows that pistachios aren't just a tasty snack—they may also be great for your eyes," said Dr. Tammy Scott, a research and clinical neuropsychologist and lead

author of the study. "By eating a small amount every day, you may help protect your vision, especially as you get older."

How Pistachios Help the Eyes

"Lutein is an antioxidant that acts like sunglasses for your eyes," explains Dr. Scott. She adds that lutein is selectively taken up into the retina and helps filter out harmful blue light from computer screens and sunlight and may help reduce damage to the delicate parts of the eye.

Average lutein intakes are very low in the United States,5 but eating pistachios may help change that. In the study, about 1.6 mg of lutein was provided from pistachios, which would be enough to double the average daily consumption of lutein in adults.5

"By simply incorporating a handful of pistachios into your diet, you can improve your intake of lutein, which is crucial for protecting your eyes," notes Dr. Scott. She adds that pistachios provide a source of healthy fat, potentially making the lutein from pistachios better taken up into the body the bodv.

More Than Just Eye Health

Pistachios aren't just good for the eyes—they also have other antioxidants and plant-based compounds that could support overall healthful aging including brain health.6,7,8 "As in the retina, lutein selectively accumulates into the brain, where it may help reduce oxidative stress and inflammation," notes Dr. Elizabeth Johnson, a co-investigator on the study. This makes them a great snack choice for people looking to improve overall health and well-being.

The health benefits from eating pistachios may also happen quickly. For example, this study found that it only takes six weeks of daily pistachio eating to start seeing possible eye health benefits. "Adding pistachios to your diet is an easy and simple change to make for your health," notes Dr. Scott. "It's never too early to start to think about what you can do to support healthy aging," Dr. Scott adds.





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### **DPR Releases Six-Month Progress Update on Nation's** First Pesticide Notification System

Six months since its launch, SprayDays California expands access and awareness across agricultural communities.

WHAT YOU NEED TO KNOW:

Since its launch, SprayDays California has drawn more than 72,000 website views and more than 3,700 text and email signups for notification messages, connecting thousands of Californians with real-time pesticide information.

The California Department of Pesticide Regulation (DPR) today released its Six-Month Progress Update for SprayDays California, highlighting early metrics, engagement and enhancements to the nation's first statewide pesticide notification system.

Since launching on March 24, SprayDays California has made it easier for agricultural communities to access real-time information about when restricted material pesticides, which are highly regulated in California, are used in production agriculture.

SprayDays California provides the public with timely information about nearby pesticide applications before they occur. The tool includes an interactive map and optional text and email notifications so that Californians can make more informed decisions and better understand how pesticide regulation works in the state.

SprayDays was created in response to growing public interest in pesticide use—especially among people who live or work near fields in California's farming regions.

Six-month highlights (March 24 - September 24, 2025) include:

- More than 72,000 total website views, including nearly 25,000 visits to the interactive map.
- More than 3,700 text and email sign-ups for notifications
- More than 73,000 notification messages (texts and emails) delivered to users statewide.
- Top counties by total sign-ups: Monterey, Ventura, Santa Cruz, Santa Clara, and Stanislaus.

"SprayDays represents a major milestone in providing real-time information about pesticide use—helping Californians know what's happening in their area to make informed decisions and understand the comprehensive regulatory framework that ensures safe, legal pest management across the state," said Karen Morrison, DPR Director. "We're encouraged by the early engagement and grateful to our partners and community members who continue to get the word out about the system and share feedback with us on ways we can make it better."

Over the past six months, DPR has introduced several improvements, including:

- Recent Application Indicator: A new dotted map pattern highlights recent applications scheduled within a previous fourday notification window.
- Section-Based Sign-Up: Users in unincorporated areas can now subscribe by simply selecting a map section, expanding
- Enhanced FAQs: A new search bar and expanded information help users find answers to frequently asked questions more easily.
- Multilingual Resources: Educational materials are now available in multiple languages, including Punjabi, Hmong, Chinese, and Korean, to increase access for more communities.
- System Performance: DPR has also improved system performance and map speed, ensuring stability during periods of high traffic and increasing public interest.

As a part of its efforts to continue to refine SprayDays California, DPR will open a formal period early next year for gathering feedback from the public, the State Board of Food and Agriculture, reflecting the perspectives of growers, and DPR's Environmental Justice Advisory Committee, which includes representatives from community-based organizations and public health advocates. The department plans to release its first annual report in early 2026.

To view DPR's full Six-Month Progress Update and learn more about SprayDays California visit the following: https://www.cdpr. ca.gov/wp-content/uploads/2025/10/spraydays\_six\_month\_update.pdf

#### **Almonds Hulls**

continued from page 14 could be better classified and ranked.

"We would de-twig the product; it would be screened, and the screen would sift out all of the fines from the hulls," he said. "What is left over is what we would call scalped hulls, and this is your larger, good material created from the early stages of hulling."

From their observation, Wilkey Industries also found that 1 to 1.3% of total hull weight can actually be recoverable kernel.

"That translates to roughly 3% of your kernel production that is actually sitting in the hull pile," he said. "So, by integrating a screen and some additional aspiration, not only can we clean the hulls, but we can also reclaim those kernels and hash that have much higher value to be sold instead of letting them go to dairy feed uses."

#### **Additional Sorting Techniques**

As cleaning technologies continue to advance, innovations in color sorting are emerging as a key tool for preparing almond hulls for food-grade applications. The team at Chandler Automation has spent

time working on this, and the initial models have been successful at "creating pure hull piles in one pass," said CEO, Sean Chandler.

More research is needed to determine where this best fits in the manufacturing process – be it at the huller, processor, or a separate site and how it will be financially feasible.

"We have to do more research on our side to see the best way to mechanically clean hulls, mechanically feed it, and mechanically pass it through our systems because the technology is there to create that pure, premium hull," he said.

#### **Looking Ahead**

As ABC continues to refine its strategy for marketing almond hulls as a food ingredient, the industry is taking proactive measures to position itself for success, and that starts with collaboration among all players involved.

"We are about to begin a new journey to generate more revenue from almond hulls," Huang concluded. "It will take a while and more effort to develop the market and demand, but if you are interested in creating more value out of almond hulls, many of us can work together to shorten the process."



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## Secretary Rollins Announces Plan for American Ranchers and Consumers

U.S. Secretary of Agriculture Brooke L. Rollins, Secretary of the Interior Doug Burgum, Secretary of Health and Human Services Robert F. Kennedy Jr., and Small Business Administrator Kelly Loeffler announced a suite of actions to strengthen the American beef industry, reinforcing and prioritizing the American rancher's critical role in the national security of the United States. Since 2017, the United States has lost over 17% of family farms, more than 100,000 operations over the last decade. The national herd is at a 75-year low while consumer demand for beef has grown 9% over the past decade. Because increasing the size of the domestic herd takes time, the U.S. Department of Agriculture (USDA) is investing now to make these markets less volatile for ranchers over the long term and more affordable for consumers.

"America's food supply chain is a national security priority for the Trump Administration. We are committed to ensuring the American people have an affordable source of protein and that America's ranchers have a strong economic environment where they can continue to operate for generations to come," said Secretary Brooke Rollins. "At USDA we are protecting our beef industry and incentivizing new ranchers to take up the noble vocation of ranching. Today, USDA will immediately expedite deregulatory reforms, boost processing capacity, including getting more locally raised beef into schools, and working across the government to fix longstanding common-sense barriers for ranchers like outdated grazing restrictions."

"At Interior, the Department is slashing red tape and restoring grazing access on public lands to support the livelihoods of hardworking Americans in the ranching industry," said Secretary of the Interior Doug Burgum. "Thanks to President Trump, this administration is taking decisive action to support America's farmers and ranchers so that they can support American families



with high quality beef."

"We face a chronic disease epidemic in this country largely tied to the foods we eat," said Health and Human Services Secretary Kennedy. "Under President Trump, we are restoring whole foods as the foundation of the American diet and ending the decades-old stigma against natural saturated fat in beef and dairy products. We will strengthen America's ranching industry so families can choose nutrient-dense, minimally processed foods. Bottom line: we cannot Make America Healthy Again without America's farmers and ranchers."

"Ranches and farmers are the original small businesses. Over generations, they carry on the vital legacy of feeding, clothing, and fueling America," said SBA Administrator Kelly Loeffler. "Today, thanks to the leadership of President Donald J. Trump and Secretary Rollins, this Administration is taking major action to strengthen our food supply and the beef industry by offering more security for the hardworking ranches our nation depends on. The SBA is committed to doing its part by cutting burdensome regulations and supplying government-guaranteed loans to support our producers as they work to strengthen the American beef supply - for consumers, our national security, and the proud American tradition of ranching."

### California nursery industry grapples with plastics, water, nutrients



Chief operating officer of Brokaw Nursery, Consuelo Fernández Noguera, demonstrates her process for twice-grafting an avocado seedling.

Photo by Caroline Champlin

By Caroline D Champlin

2025 California Nursery Conference briefs growers on a roundup of new environmental laws on single-use plastics, water efficiency and nutrient management

Nursery owners and landscapers are anticipating a slew of new laws to roll their way over the next few years. These rules are poised to alter business as usual in all sectors of the horticultural industry, from cut flower operations to native plant nurseries.

The new rules encompass a variety of environmental topics, including single-use plastic pots, water use and nutrient management.

Meanwhile, looming over the nursery industry is the warming climate, forcing business owners to adopt strategies that protect their plants – and profits – from record-breaking heat waves.

Scientists from University of California Agriculture and Natural Resources brought these hot topics, and many others, to business owners' attention at the 2025 California Nursery Conference. For the first time in years, the conference and accompanying farm tours were held in Ventura County.

"Growers from Ventura County were happy to have the conference in their backyard...to be able to have the industry come to them," said Emma Volk, UC Cooperative Extension production horticultural advisor for Ventura County and one of the lead organizers of the conference.

During the planning stage, Volk and other members of UC Nursery and Floriculture Alliance consulted with growers in their network to design a conference agenda that addresses the big questions in the world of potted plants.

"Policy is the big thing that we're talking about," Volk said. "There's a lot of policy surrounding the horticulture industry right now that we're all trying to solve."

That emphasis resonated with attendee Manuel Morales from Los Arroyos International Wholesale Nursery in Watsonville. This year marked Morales' 25th time attending the California Nursery Conference. Over his career, he's seen more laws come on the books every year.

"It's becoming more restricted and more restricted," the Santa Cruz County grower said.

UC scientists add value for growers like Morales by breaking down the complexities of rules, including the research they conduct on related science.

"A lot of growers, we don't understand the technical part. We understand the practical part, but the technical part gets hard," Morales said. "It's a different layer."

What keeps Morales coming back to this conference is the opportunity to hear from experts who can clearly communicate the connections between science, business and policy.

"I like to learn more every time I go," Morales said.

Two people shake hands over a table outside

UC Cooperative Extension advisor Grant Johnson (right) ran a booth at the 2025 California Nursery Conference to help attendees measure nutrients in liquid feed for their plants. Photo by Caroline Champlin

Plastic pollution prevention

Rows of plants in black plastic pots are a ubiquitous sight at California nurseries, but according to a new state law, the reign of those containers is coming to an end.

One of the topics at the California Nursery Conference was Senate Bill 54, a sweeping law passed in 2022 that's meant to curb pollution by targeting the sale of single-use plastics like those containers for growing plants. The law requires that 100% of single-use packaging sold in the state be recyclable or compostable by 2032.

"It's going to take a lot of money to comply with what they're trying to do," said Morales. "Some containers we reuse, but sometimes we can't because we don't want contaminants with the plant. And if you don't have a place to recycle, what do you do with the plastic?"

Details about the law are still up in the air – the official regulations that will enact it are currently being drafted. At the California Nursery Conference, members of the Plant California Alliance, an industry group, briefed attendees on the issue and invited them to participate in the rule-making process.

No more potable water on non-functional turf

Native plants and low-water landscaping stole the show at this year's conference, recurring as a theme in multiple presentations. Climate-adapted plants featured prominently in a discussion about a new law that's set to reform water use on certain California landscapes.

In this drought-prone state, lawns are a luxury that soak up precious potable water. While parks offer recreational and environmental benefits, lawns in other settings may be considered "non-functional," like those covering medians or incorporated into an office's landscaping.

See California Nursery Industry page 27

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## **UPCOMING EVENTS**

#### **NOVEMBER 2025**

7-9: California Women for Agriculture is Turning 50! The Golden Weekend Celebration is for the 50th Anniversary of the California Women for Agriculture (CWA). The celebration will be held in Coachella Valley. The hotel for the event is the Embassy Suites Hotel in La Quinta, CA. For more information you can email Coachella Valley CWA@gmail.com.

#### DECEMBER 2025

3-5: 109th Annual CCA/CCW Convention. The 2025 California Cattlemen's Association and California Cattlewomen's Convention and California Cattle Industry Tradeshow. For the first time, our largest gathering of the year will be held at the Atlantis Casino Resort Spa in Reno, Nevada. For information call (916) 444-0845 or visit: https://calcattlemen.org/event/109th-annual-cca-ccw-convention/

4: 2025 13th ANNUAL WIN EXPO Trade Show & Conference. The trade show features nearly 300 exhibitors presenting the latest products and services available along with a robust educational conference focusing on four distinct tracks, Production & Winemaking, Sales & Marketing, Strategy & Leadership, and Vineyard & Growers. The event is hosted at the Sonoma County Fairgrounds in Santa Rosa, CA.

#### FEBRUARY 2026

10-12: World Ag Expo®, the largest annual agricultural show of its kind. Held in Tulare, California, World Ag Expo® provides a platform of networking, education, and business in one of the most productive ag counties in the United States. For information visit: https://www.worldagexpo.com

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### **California Nursery Industry**

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Starting in 2027, California Assembly Bill 1572 outlaws the use of potable water to irrigate non-functional turf in



UC Cooperative Extension environmental horticulture advisor Bruno Pitton (right) watches an avocado grafting demonstration at Brokaw Nursery. Photo by Caroline Champlin

commercial, industrial and institutional settings. That means governments and business owners may turn to nurseries for help crafting alternative landscapes.

That could be a golden opportunity to market climate-adapted plants, according to UC Cooperative Extension environmental horticulture advisor Joanna Solins, who gave a lecture on the new law. She encourages growers to ready their inventory, investing in low-water plants and ensuring that nursery practices prepare those plants to thrive with limited irrigation.

Irrigation and nutrient management plan

Diligent fertilizer management is key for growers to conserve resources while protecting the environment from harmful runoff. Those management considerations are now an official requirement – the State Water Resources Control Board mandates growers complete Irrigation and Nitrogen Management Plans to monitor various inputs and outputs at their facilities.

Several UC ANR horticultural experts gave presentations to support local growers working through these new expectations.

Bruno Pitton, UC Cooperative extension environmental horticulture advisor for Nevada and Placer counties, shared his research quantifying nitrogen outputs from a nursery system. He found that only a small fraction of applied nitrogen - just 3% - had the potential to leach into groundwater with the majority remaining in the potting soil.

According to Pitton, accurately measuring the nitrogen removed from the wide variety of crops typically sold by a single nursery is cost-prohibitive. He hopes the state will take that into consideration and develop guidelines suited to the diversity of the nursery industry.

"We should go to the state board and advocate for something better," Pitton said. "We can protect our water quality

and not be a huge burden on the industry."

In the meantime, Pitton encourages growers to implement best management practices like optimizing irrigation and fertilizer application, monitoring crop nutrient needs and recycling irrigation runoff water to reduce water-soluble fertilizer losses from nurseries – all methods that UC Cooperative Extension experts have been working on for years.

On the patio outside the conference hall, UC Cooperative Extension advisors stood at the ready to offer growers demonstrations and hands-on tools to accurately evaluate nutrient inputs of their facilities.

Hot tips for heat wave management

In addition to gearing up for new policies, growers have other challenges weighing on their businesses. For Justina Gutierrez of Sakaida Nursery, the changing climate is at the top of that list. Her family runs their wholesale nursery in Rosemead, part of Los Angeles County.

"It's getting hotter," Gutierrez said. "Our production is outside, and we do experience plant burn...the summer's pretty hard for us."

Gutierrez took careful notes during the presentation on heat waves from Don Merhaut, UC Cooperative Extension nursery and floriculture crops specialist serving Riverside County.



UC Cooperative Extension production horticultural advisor Emma Volk (right) coordinated tours of multiple nurseries in Ventura County as part of the 2025 California Nursery Conference, including a visit to Boething Treeland Farms. Photo by Caroline Champlin

Merhaut's talk infused heat wave data with personal discoveries he made over his 26-year career at UC ANR. He let the audience in on a tip he picked up from observing nurseries in his neighborhood – the local growers had affixed each stake to the plants' southwest side. To Merhaut's trained eye, that practice was clearly a heat management strategy, casting the stake's shadow on the plant, affording it a break from the sun.

Gathering these kinds of lessons from growers is what makes Cooperative Extension programs successful, Merhaut says, in addition to the rigorous research they conduct.

"When I approach a nursery grower, I'm always learning as well. It's a two-way street," Merhaut said. "I always make sure that I'm paying attention."

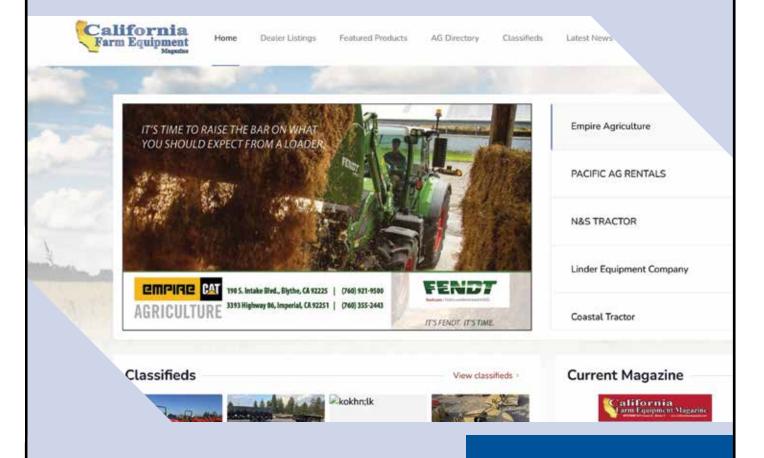
Gutierrez left the conference excited to take a closer look at the stakes in her own plants, hopeful that a small solution will see her operation through the hottest time of year.

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### **Program Development Committee Assembles Industry Leaders for the** 2026 Unified Wine & Grape Symposium

With the wine industry at a pivotal crossroads, the Program Development Committee for the 2026 Unified Wine & Grape Symposium is answering the call to "reframe the narrative" through innovative programming that challenges conventional thinking and inspires fresh perspectives. Under the strategic leadership of returning co-chairs Devin Parr, founder and managing partner of Devin Parr & Associates and Susan Owen, senior director of sales at G3 Enterprises, the committee is developing a groundbreaking educational experience that empowers wine and grape professionals to reshape perceptions, overcome industry challenges and unlock new opportunities through sessions spanning winemaking, grapegrowing, public relations and marketing, business and operations, and a pioneering Spanish-language workshop.

The Program Development Committee brings together an impressive roster of 30plus wine and grape industry professionals who have been selected for their expertise, intimate knowledge of the wine industry and fresh perspectives on the latest innovations and trends.

#### **Distinguished Committee Leadership**

Devin Parr is a leading voice in the wine industry and founder of Devin Parr & Associates, a PR, marketing and content agency for the beverage, travel and tourism sectors. She holds a WSET diploma and was named one of Wine Enthusiast Magazine's Top 40 Under 40 Tastemakers in 2017. Parr is a frequent industry speaker, regular contributor to major wine publications and co-founder and editor-in-chief of "The Vintner Project."

Susan Owen brings 15 years of wine industry experience that began in Chile's Casablanca Valley. As senior director of sales at G3 Enterprises, she leads a team of wine packaging experts across North America. Owen previously served as general manager of Juclas USA, specializing in enological ingredients and membrane technology equipment, and is an active member of Rotary International.

#### **Industry Expertise Across All Sectors**

The 2026 Program Development Committee represents a comprehensive cross-section of the wine industry, featuring leaders from:

Academia and Research: Federico Casassa and Miguel Pedroza (Cal Poly San Luis Obispo), Leticia Chacón-Rodríguez and Cristina Medina Plaza (UC Davis), Tom Collins and Jim Harbertson (Washington

State University), Alfredo Koch (Allan Hancock College) and Keith Striegler (GALLO).

Vineyard Management and Winemaking: Erin Amaral (Pacific Farming), Francisco Araujo (Atlas Vineyard Management), Carmen Giuffre (Agrovin Group), Charlie Hamilton (KG Vineyard Management), Randy Heinzen (Vineyard Professional Services), Steven Kukesh (Delicato Family Wines), Anne Sery (NW Wine Company), Matt Stornetta (Stornetta Made Farming), Sean McKenzie (Crossbarn Winery), Hillary Sjolund (Aperture Cellars) Norm Peters (Silver Oak) and Luciana Turkovich (Turkovich Wines)

Marketing and Public Relations: Meghan Phillips and Maggie Giordanengo

**Business and Operations: Peter** Andrews (Culture Wine Co.), Audra Cooper (Turrentine Brokerage), TJ Douglas (Urban Grape), Ed Feuchuk (Tank Garage), Gaspar Roby (Terlato Wine Group), Dale Stratton (Azur Associates) and John Trinidad (DPF-

Supply Chain: Ali Bowyer (G3) Regional Associations: Krista Chaich (Temecula Valley Winegrowers Associa-

Consulting and Independent Professionals: Eva Bertran (Eva Bertran Consulting), Juliana Colangelo (Frederick Wildman & Sons), Alisa Jacobson (Turning Tide Wines) and Julie Lumgair (Winemaker/ Consultant)

#### Looking Ahead to 2026

The Unified Symposium will host its conference and trade show on January 27-29, 2026, at the SAFE Credit Union Convention Center in Sacramento, California, with the exhibits open January 28 & 29. The trade show will feature more than 800 booths displaying products and services from across the wine and grape industry. Registration is now open.

For more than three decades, the Unified Symposium has been the premier gathering place for wine and grape industry professionals across the Americas, hosting the largest trade show of its kind. Co-sponsored by the American Society for Enology and Viticulture (ASEV) and the California Association of Winegrape Growers (CAWG), this collaborative platform brings together growers, vintners, and allied industry members to share knowledge, drive innovation and shape the future of the industry. For more information about the 2026 show, visit www.unifiedsymposium.org.

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