



# California Farm Equipment Magazine

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## USPOULTRY Foundation Brings National FFA Officer Candidates to the 2026 IPPE

As part of the USPOULTRY Foundation's ongoing commitment to supporting the recruitment and training of top students while promoting careers in the poultry and egg industry, National FFA Officer Candidates were invited to attend an all-expense-paid trip to the 2026 International Poultry Expo, part of the International Production & Processing Expo (IPPE).

"USPOULTRY's commitment to FFA is strong. Offering these National Officer Candidates the opportunity to experience the world's largest annual trade show for the poultry, egg, meat and animal food industries is a valuable way to introduce them to our industries and inspire them to become future industry leaders," said Jonathan Cade, Hy-Line International Inc., and chair of the USPOULTRY Foundation.

The National FFA Officer Candidates had the opportunity to take part in the USPOULTRY Foundation College Student Career Program, where they could interview for internships with poultry and egg industry companies and exhibitors. They also explored the wide-ranging opportunities within the industry, including the vast IPPE trade

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**18 Can a simple spray protect grapes from wildfire smoke?** Smoke from wildfires can alter grapes and affect the taste and sensory experience of wine, threatening California's \$88 billion industry as it faces an increase in fires on the horizon.

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\*\* Palletted Items and (19) 40' Containers, Location: 16715 Sierra Hwy, Canyon Country, CA 91351. Items will be sold at April 11th Auction @6200 Price Way, Bakersfield, CA. Buyers will have to arrange pickup for these items @Canyon Country Location. Please see webpage for more information: [www.gouldauction.com](http://www.gouldauction.com)



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## USPOULTRY Accepting Research Pre-Proposals

USPOULTRY and the USPOULTRY Foundation are inviting colleges, universities and research facilities to submit research pre-proposals by May 1 for the 2026 Fall Research competition. The program supports innovative research aimed at addressing key challenges across poultry and egg production, from animal welfare and food safety to environmental management and employee health.

Through its long-standing research program, USPOULTRY partners with leading universities and research institutions to generate practical solutions that strengthen the poultry industry and support safe, efficient food production.

Pre-proposals consist of a one-page synopsis submitted through the online submission form. The Foundation Research Advisory Committee will review submissions and invite full pro-

posals that align with the industry's current research priorities.

The current priority research list includes goals and objectives across several areas of poultry production and processing, including: animal welfare, breeder management (turkeys and broilers), meat bird management, commercial egg production, diseases, environmental management, food safety, hatchery management, nutrition, processing and employee safety health.

A complete list of research priorities, along with submission instructions and deadlines, is available on the USPOULTRY website.

Researchers are also encouraged to submit proposals addressing emerging issues outside the priority list if they demonstrate a clear industry need. Funding decisions for selected projects will be announced in late September.

# Planting Season Playbook: What Smart Growers Are Doing Differently With Weed Control This Spring

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By Christie & Co Communications for LASCO Lightning Weeder

By the time this issue hits your desk, spring fieldwork will be in full swing across the Central Valley. Beds are being shaped, transplants are going in, and in many fields, weeds are already making their move. None of that is new. What is changing is how growers are choosing to respond.

For decades, the standard play was straightforward: spray early, spray often, and rely on chemistry to keep fields clean through the season. That approach still works in plenty of situations. But across the San Joaquin Valley and beyond, more growers are adding non-chemical tools alongside their spray programs — not replacing them, but layering in additional methods to deal with problems that chemistry alone is struggling to solve.

The reason is simple: herbicide resistance is no longer a distant headline. UC Davis and Fresno State researchers have confirmed ALS-inhibitor resistance in common chickweed populations in the southern San Joaquin Valley. Glyphosate-resistant weeds — including hairy fleabane, horseweed, and Italian ryegrass — are well documented across orchard and vineyard regions throughout the state. Palmer amaranth, one of the most aggressive resistant weeds in the country, is showing up in California cotton. When a grower's go-to herbicides stop working on a weed that used to be easy to control, the farmer needs a new solution.

Math is what's driving the shift. When a spray program fails or underperforms, the follow-up options aren't cheap. More passes, more products, more fuel, more labor — and tighter windows to get it all done before crop development makes it too late. Growers who are rethinking their approach aren't doing it because they read a magazine article about sustainability. They're doing it because the numbers on their cost sheets told them something had to change.

## ***Adding Tools, Not Replacing Them***

The growers getting out ahead of this aren't abandoning their spray rigs. They're building what the university extension folks call integrated weed management programs — which, in plain terms, means using more than one method to hit weeds from different angles. Cultivation, cover cropping, targeted mechanical removal, and increasingly, electrical weed control are all showing up as layers in the program.

Electrical weed control has been around longer than most people realize. LASCO has been developing the technology since 1979 — 47 years of building, testing, and refining in real field conditions. Their Lightning Weeder uses an Electric Discharge System that delivers precise electrical pulses directly to weeds, disrupting plant tissue from root to shoot. The crop and soil stay intact. No chemical residue. No soil disturbance. The system runs at 2–6 MPH, the height is adjustable for different crops, and it includes a safety interlock system for operator protection.

Kevin Olson, who founded LASCO alongside his wife Linda,

has spent his career farming and building equipment to solve the problems he saw firsthand in the field. As he puts it: "The Spring season sets the trajectory for the entire year, and farmers don't have the luxury of waiting when weeds get ahead. When early weed pressure goes unmanaged, it drives up costs, erodes yield potential, and ultimately affects the price and availability of food."

## ***Timing Is the Whole Game***

Every grower in the Valley knows that the first few weeks of the season set the tone for everything that follows. Weeds that get established early compete aggressively with young crops for moisture, nutrients, and sunlight — right when the crop is most vulnerable. Miss that window and you're chasing the problem for the rest of the year.

That urgency is exactly where a tool like the Lightning Weeder fits. It gives growers a way to make passes on emerging weeds without adding chemical inputs or disrupting the soil biology they've been working to build. Three passes per season is typical for optimal control — hitting weeds when they're young and scattered rather than waiting until they're mature and dense. As a general rule, the time to make a pass is when weeds stand about four to six inches above the crop canopy.

For organic operations, specialty crops, or any field where chemical options are limited, that kind of flexibility matters. But conventional growers are finding value too. Adding a non-chemical pass between spray applications can reduce selection pressure for resistant biotypes while still keeping fields clean. It's not an either-or proposition. It's another tool in the shed.

## ***What to Think About Right Now***

If you're finalizing your spring weed management plan, here are the practical questions worth asking: Which fields had herbicide escapes last year? Where is resistance showing up in your area? What's your backup plan if your primary spray program underperforms? And are there spots in your rotation where a non-chemical pass could take pressure off the chemistry you're relying on?

The growers who are adapting fastest aren't the ones making dramatic overhauls. They're the ones adding one or two tools to a program that's already mostly working, and tightening up the weak spots before they become expensive problems. That's smart farming. Always has been.

## ***About LASCO***

LASCO develops a chemical-free weed control system that gives farmers reliable tools to reduce complexity, restore soil vitality, and diminish chemical dependence. The LASCO Lightning Weeder uses an electric discharge system (EDS) to facilitate weed control while also ensuring zero damage to crops. The Lightning Weeder received the Blue Ribbon Award at the 2026 International Sugarbeet & Dry Bean Expo.

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## Unified Wine & Grape Symposium Highlights Shift Toward Planning and Stabilization

The 2026 Unified Wine & Grape Symposium concluded Thursday, January 29th with signs of a broader shift in the American wine and grape industry, as conversations moved from acknowledging market disruption to planning for stabilization and future opportunity.

"This year's symposium reflected a grounded and forward-looking mindset," said Natalie Collins, president of California Association of Winegrape Growers and co-host of the Unified Wine & Grape Symposium. "There was a clear willingness to confront difficult realities, but also a shared focus on problem-solving, collaboration and positioning the industry for what comes next."

In addition to the lineup of seminars and panel discussions hosted in Sacramento, the Unified Wine & Grape Symposium dedicates over 200,000 square feet at the convention center to supplier exhibits. Featuring products ranging from corks, barrels, and vines to mammoth grape harvesters and everything in between, the trade show offers industry members a one-stop opportunity to explore new technology, services, and solutions, all under one roof. "We had strong, high-quality traffic and meaningful conversations," said Dan Howard, executive director of the American Society for Enology and Viticulture and co-host of the Unified Wine & Grape Symposium. "Exhibi-



tors were meeting the right people – the buyers, owners, and operational leaders who are making decisions. That is exactly what the trade show is designed to deliver."

The conversation will continue next year at the 2027 Unified Wine & Grape Symposium, held January 26-28 at the SAFE Credit Union Convention Center in Sacramento, California.

Put on by the industry, for the industry, the Unified Wine & Grape Symposium serves as a clearinghouse of information for wine and grape industry professionals for more than 30 years. As the largest wine show of its kind in the Western Hemisphere, the show combines seminars and panel discussions with a massive trade show featuring more than 650 exhibitors and 800+ booths. For more information, visit [www.unifiedsymposium.org](http://www.unifiedsymposium.org).

# New Funding to Connect Farmers to Local Markets Announced



The U.S. Department of Agriculture (USDA) announced it has awarded over \$26.8 million to grant projects through the Local Agriculture Market Program (LAMP). The program helps local and regional food entities develop, coordinate, and expand producer-to-consumer marketing, local and regional food markets, and local food enterprises. LAMP includes the Farmers Market Promotion Program (FMPP), Local Food Promotion Program (LFPP), and the Regional Food System Partnerships (RFSP).

“Part of our efforts to put Farmers First is to boost demand for locally grown food and connect our farmers to these growing regional markets. The Local Agriculture Market Program is an important part of USDA’s work to grow strong local and regional food systems,” said U.S. Secretary of Agriculture Brooke L. Rollins. “This funding is putting Farmers First by helping them connect with new markets, strengthening their businesses, and boosting economic resilience in rural communities. At the same time, it gives families better access to fresh, locally grown food, making it easier for everyone to enjoy healthy meals while supporting the farmers who grow them.”

FMPP is awarding almost \$11.1 million to 43 projects FMPP FY2025 Description of Funded Projects across 28 states and territories. The program funds projects that support producer-to-consumer markets such as farmers markets, roadside stands, agritourism activities, community-supported agriculture programs, and online sales.

LFPP is awarding almost \$11.1 mil-

lion to 37 projects LFPP FY2025 Description of Funded Projects across 24 states and territories. The program supports local and regional food businesses that engage as intermediaries in indirect producer-to-consumer marketing. The awarded projects focus on activities such as supporting the processing, aggregation, distribution, and storage of local and regional food products; developing value-added products; and facilitating regional food chain coordination.

Through RFSP, about \$4.7 million is being awarded to seven partnerships RFSP FY2025 Description of Funded Projects across 10 states. The program supports the development of relationships between local and regional food businesses and institutions, such as schools, hospitals, and governments, to increase local and regional foods in institutional cafeterias and meal programs.

LAMP and its accompanying grant programs are administered by USDA’s Agricultural Marketing Service (AMS) and are funded through the 2018 Farm Bill. These programs require a 25% cost share amount of federal funds being requested. For more information, visit the AMS LAMP webpage.

AMS supports U.S. food and agricultural product market opportunities, while increasing consumer access to fresh, healthy foods through applied research, technical services, and congressionally funded grants. These projects will support the development, coordination and expansion of direct producer-to-consumer marketing, local and regional food markets and enterprises, and value-added agricultural products.

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# CDFA, UC ANR and partners introduce California Agricultural Research and Innovation Roadmap

By Michael Hsu

As California agriculture faces both challenges and opportunities, a coalition of state, academic and agricultural industry partners is introducing the California Agricultural Research & Innovation Roadmap, a blueprint to guide and accelerate scientific discovery, and commercialization and real-world adoption of next-generation tools.

Guided by farmer and rancher input, the plan was developed collaboratively by the California Department of Food and Agriculture (CDFA), University of California Agriculture and Natural Resources (UC ANR), the California State University Agricultural Research Institute (ARI), California Community Colleges, Western Growers and the California AgTech Alliance.

Cover of the California Agricultural Research & Innovation Roadmap, which features images of farmers and researchers working with crops and an aerial view of rectangular agricultural fields and mountains

The roadmap provides both a long-term focus via 10-year research priorities identified in collaboration with all partners, and near-term solutions through innovation priorities, spearheaded by the California AgTech Alliance and updated every two years. Download the roadmap.

"No single institution can carry the future of agricultural research and innovation alone, and the significance of this plan is the commitment from multiple parties to work together to turn the plan into action," said CDFA Secretary Karen Ross. "This roadmap clearly shows the need for inter-disciplinary approaches to the many challenges we face now and into the foreseeable future. California's world-class public academic institutions have long been partners in the innovation of California farming and ranching. With the support of agricultural leaders, they have the power to accelerate the discovery of solutions to drive the health of our rural communities, the environment, and all California citizens."

Research priorities include: Climate Resilience and Environmental Sustainability; Water Management, Use Efficiency and Quality; Integrated Pest and Disease Management; Food Safety and Consumer Health; Technology, Automation and Data-Driven Farming; and Economics, Policy and Adoption Pathways. Together, these areas represent the scientific foundation needed to maintain productivity, resilience and economic viability across California's diverse agricultural systems.

"UC ANR is well-positioned to be one of the key drivers as we follow this roadmap toward a more prosperous future for California agriculture," said Glenda Humiston, UC vice president for agriculture and natural resources. "Building on more than 150 years of experience connecting our producers with breakthrough innovations, we are committed to advancing ag tech, translating research for policymakers, training and upskilling our agricultural workforce, and sharing practical new tools that will make California's farms and ranches even more productive and sustainable."

Roadmap partners — many of which hold important roles in educating and training for the ag workforce skills needed



today and in the future — acknowledge that workforce development is a critical element to securing California's agricultural future.

In support of the roadmap, each partner has committed to aligning its resources to support the plan. Partner commitments include:

CDFA will convene state agencies and partners, inform policymaking with the latest science and align grant opportunities with roadmap priorities.

UC ANR will direct research funding toward these priorities, translate science for policymakers and help farmers adopt new practices through Cooperative Extension, while also introducing the roadmap to new researchers.

ARI will prioritize research aligned with the roadmap in its funding decisions, launch a Collaborative Innovation Grant for teams across institutions and disciplines, modernize workforce training- curricula and support skills development for students.

California Community Colleges will codevelop new agricultural curricula, align workforce training with the roadmap, promote ag careers through recruitment efforts, expand apprenticeships, provide reskilling and upskilling for current and future workers, and support climate focused- initiatives that advance sustainable agriculture.

Western Growers will involve farmers in validating the roadmap's priorities, align ag tech solutions with those priorities and help drive widespread industry adoption of research based- innovations.

California AgTech Alliance will develop a list of farmer- and workforce-driven innovation priorities with commercialization potential to be updated every two years.

While the plan is being rolled out, it is constantly evolving. Stakeholders are encouraged to provide feedback on the roadmap, and those who fund agricultural research are encouraged to do so in alignment with the research priorities.

To learn more about how you can support the roadmap or get involved, contact Josh Eddy at 916-654-0462 or [josh.eddy@cdfa.ca.gov](mailto:josh.eddy@cdfa.ca.gov).

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# Study examines practicality of methane-reducing seaweed for grazing cattle

*Project at UC ANR center in Yuba County probes additive effectiveness on rangelands*



*California rangelands lack minerals such as selenium and zinc, so adding red seaweed to mineral supplements placed by ranchers could decrease the methane production of grazing cattle. Photo by Evett Kilmartin*

By Michael Hsu

Previous studies have shown that adding red seaweed (*Asparagopsis taxiformis*) to beef cattle rations could reduce methane – a potent greenhouse gas – produced by the animals by up to 90%.

But those results were in controlled settings – not wide-open rangelands.

“The challenge now is finding a reliable method of delivering the seaweed product to cattle grazing on pasture,” said Andrea Warner, a University of California Cooperative Extension livestock and natural resources advisor for Sutter, Yuba, Placer and Nevada counties.

“Cattle in feedlots or dairies are being fed a total mixed ration every day and they’re in a more controlled environment,” Warner explained, “whereas out here [on rangelands] we could have cattle grazing on several hundred acres of pasture.”

Scientists added red seaweed to a salt-based mineral supplement mix, which they put in “free choice” feeders – covered metal troughs – in the pasture. When they tried to measure results, they discovered two things. One, actual consumption of the supplement was inconsistent, with seemingly less efficacy in decreasing methane output. And two, their conclusions were limited by significant shortcomings in their data.

“Our results really said that we needed better capabilities to make measurements,” said Sheila Barry, UCCE livestock and natural resources advisor for the San Francisco Bay Area.

Barry is the first author of a study published last year, funded by the Russell L. Rustici Rangeland and Cattle Research Endowment, UC Davis. The authors concluded that additional research – with improved equipment and methods – was needed to better understand how seaweed additives could realistically be incorporated into grazing systems.

That’s why Barry, Warner and their collaborators are back

with a new project at UC ANR’s Sierra Foothill Research and Extension Center in Browns Valley, Yuba County. This study is funded by the California Department of Food and Agriculture’s Livestock Enteric Methane Emission Reduction Research Program.

The first phase of the project is running “palatability trials,” to gauge whether the addition of seaweed affects the cows’ consumption of the mineral. That will help the scientists determine optimal mineral mixtures. Subsequent phases will assess consistency of the cows’ consumption, verify any reductions in methane and measure impacts on livestock performance (i.e., weight change and body condition).

Research probes practicality of seaweed additives in grazing system

While methane produced by ruminants (cattle, sheep, goats, etc.) comprises only 6% of global human-related greenhouse gas emissions, curbing that methane is regarded as the “single most effective target for near-term climate change mitigation strategies.”

“Given that it’s a short-lived greenhouse gas, there’s an opportunity – if we can reduce the amount of methane that’s coming from ruminants – to contribute more quickly to reducing greenhouse gases in the atmosphere,” Barry said.

Livestock grazing, primarily by beef cattle, occurs across 34 million acres in California – about 33% of the state’s total land area. But those rangelands, which provide 70% to 80% of forage for the state’s grazing beef cattle, lack essential nutrients such as selenium, copper and zinc.

Thus, those minerals – usually in the form of a salty, sand-like product – are regularly provided to grazing cattle by ranchers. And that mineral supplement is a promising way to incorporate red seaweed (as well as bromoform, the active ingredient that reduces methane production) into the cattle diet.

But the first study of this approach conducted at Sierra Foothill REC ran into several problems. The amount of seaweed and bromoform consumed by the animals appeared to be highly variable.

Furthermore, the “laser methane detector” – a device that emits a laser beam and measures how much light is absorbed by methane – had its drawbacks. It required each animal to be confined to a chute for at least four minutes so their breath and burps could be measured, and this limited the number of cattle that actually produced usable readings.

Importantly, the study also didn’t track or account for individual consumption patterns – instead producing only averages. The “supplement consumed by each animal” was calculated by dividing the total amount of supplement consumed by the number of days in the feeding period and the number of heads in the test group.

“We didn’t have any way to measure individual intake or control individual intake,” Barry said.

The solution? Give the cattle electronic IDs.

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## Most of the U.S. Rented Farmland is Owned by Non-Farmers

Over 2.0 million landowners rented out 348 million acres of farmland, according to the results of the 2024 Tenure, Ownership, and Transition of Agricultural Land (TOTAL) survey results released by the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS). Of these acres, 79% are owned by non-farming landlords.

Non-operating landlords include entities who rent out agricultural land under a variety of ownership arrangements (privately owned, trust, family entity, non-family entity, or other). Of the land rented out by non-operating landlords, over 251 million acres were rented out by private landowners, trusts, or family entities.

According to the survey results, rented farmland acres, combined with buildings on this land, are valued at more than \$1.6 trillion. In 2024, landlords combined received \$34.1 billion in rental income while incurring \$12.0 billion in total operating expenses.

"About 5% of the nearly 900 million U.S. farmland acres, or about 43 million acres, is slated for ownership transfer in the next five years, not including farmland that is in or is expected to be put into wills or trusts," said Joseph L. Parsons, NASS Administrator.

Only 23 million acres of land are expected to be sold to a non-relative, while 20 million acres are expected to be sold to a relative or given as a gift. This means that only a small percentage of farmland will be available for purchase.

TOTAL also provides a glimpse into demographic information for 1.8 million non-farming entities, also known as principal landlords. According to the findings, the average age of these landlords is 69.2 years old. This age exceeds that of the average farmer, who is 58.1 years old, according to the 2022 Census of Agriculture. Only 12% of all principal landlords were under 55 years old. Nearly 52% of all the principal landlords have never farmed.

"As the only source of detailed information on agricultural land ownership characteristics and economic data, TOTAL provides important statistics to government, academia, the farming industry, and others regarding agricultural land ownership for planning, policymaking, research, and market analysis."

To access the complete 2024 TOTAL results, in addition to key data highlights, methodology, and Frequently Asked Questions, visit [www.nass.usda.gov/Surveys/Guide\\_to\\_NASS\\_Surveys/TOTAL](http://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/TOTAL). or the Quick Stats database at <http://quickstats.nass.usda.gov>

# How do you feel about bioengineered pest control to protect citrus trees?

*UC scientists seek consumers to weigh in on new method of controlling Asian citrus psyllids*



*Huanglongbing can kill a citrus tree in as little as 5 years, and there is no known cure or remedy. Photo by Krystle Hickman, UC Statewide IPM Program*

By Pamela S Kan-Rice

To understand consumers' attitudes toward a bio-engineered crop pesticide, University of California Agriculture and Natural Resources researchers are asking for volunteers to participate in focus groups in Riverside, Oakland and Fresno.

*Bacillus thuringiensis*, or Bt, is a naturally occurring bacterium being tested to control the spread of Asian citrus psyllid, the insect that spreads the disease huanglongbing

to citrus trees. Both the Asian citrus psyllid and huanglongbing have been found in Southern California backyard citrus trees and threaten to spread throughout the state.

Huanglongbing, also known as citrus greening disease, is a bacterial infection that stunts citrus trees, reduces their fruit production, deforms and greens the fruit and eventually kills the tree. There is no known cure or effective control.

The disease has already devastated Florida's citrus industry, slashing the state's orange production by 92% between 2005 and 2025, according to Karen Jetter, associate director and project economist at the UC ANR Policy Institute. By the time the magnitude of the problem was revealed, both Asian citrus psyllid, or ACP, and huanglongbing were widespread in Florida.

"In California, we still have the opportunity to slow the spread of huanglongbing through ACP management," Jetter said. "This unique technology

is designed to be part of a comprehensive ACP management program, not to replace it."

Jetter and Fiona Ogunkoya, survey researcher at the UC ANR Policy Institute, are conducting focus groups to assess consumer attitudes toward an engineered Bt pest control method that targets Asian citrus psyllids, the primary vector of the disease, to stop the spread of huanglongbing.

The bioengineered pest control strategy, developed in Florida and shown to be effective, uses an engineered citrus tristeza virus to transmit an engineered *Bacillus thuringiensis* to citrus trees. The Asian citrus psyllid lays eggs on the tender new leaf growth of the trees. After the nymphs hatch, the immature insects consume the modified Bt-infected leaves, become sick and die.

California citrus growers surveyed by Sandipa Gautam, UC Cooperative Extension integrated pest management citrus advisor, said they are interested in the approach. But they growers are concerned that consumers will not accept fruit grown with this new bioengineered insecticide.

To find out what consumers think, the researchers will meet with three focus groups, with each session limited to six to eight people to allow all participants time to express their thoughts.

The 90-minute focus group meetings will be held at UC Cooperative Extension offices in Riverside on March 30 at 6 p.m., in Oakland on April 6 at 2 p.m. and in Fresno on April 8 at 2 p.m. Pizza will be served.

To participate in a focus group, register for a session at <https://forms.gle/QPyUd7QazTLfNdATA>. To be eligible, participants must be 18 years of age or older and able to attend the focus group in person.

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# Leveraging Remote Sensing Tools for Irrigation Management

By Tobias E. Oker, Soils & Irrigation Advisor, UC Cooperative Extension, Kern County

As growers across California continue to navigate increasing pressure on water resources, new research from the University of California Cooperative Extension underscores the growing value of remote sensing technologies in improving irrigation efficiency and understanding crop water use.

Accurate estimates of crop evapotranspiration (ET)—the combined water lost through plant transpiration and soil evaporation—remain central to effective irrigation management. For decades, growers have relied on weather-based tools such as the **California Irrigation Management Information System (CIMIS)** to guide water application throughout the season. CIMIS provides daily reference ET values derived from a statewide network of weather stations.

“CIMIS has been an invaluable resource for growers, but weather stations alone can’t fully capture the variability across California’s vast agricultural landscapes,” said **Tobias E. Oker**, Soils & Irrigation Advisor for UC Cooperative Extension in Kern County. “Remote sensing allows us to move beyond point measurements and see what’s happening across entire fields.”

## **Remote Sensing Expands the View Beyond Weather Stations**

While weather stations remain essential, their limited density and the challenges of maintaining ideal site conditions can affect data accuracy. To address these limitations, researchers have increasingly turned to satellite-based remote sensing to estimate ET at field and watershed scales.

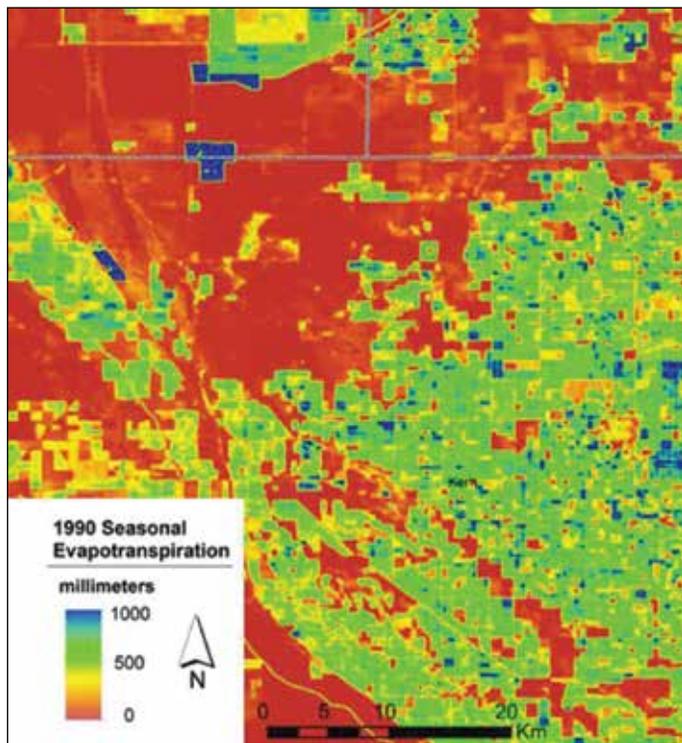
Landsat satellites—three of which are currently operational—collect thermal and spectral data that can be translated into surface temperature and vegetation indices. These inputs allow scientists to solve the surface energy balance and estimate ET at a spatial resolution of approximately 98 × 98 feet.

“Remote sensing doesn’t replace weather stations; it enhances them,” Oker explained. “Ground-based ET data still anchor the models, but satellites give us the bird’s-eye view we’ve been missing.”

## **OpenET Brings Multiple Models Together**

One of the most significant advancements in recent years is **OpenET**, a collaborative platform launched publicly in 2021. OpenET aggregates six independently peer-reviewed ET models and produces an ensemble estimate designed to improve accuracy and consistency. The platform provides data for western and midwestern states and is accessible to users through a free online account.

Early comparisons between OpenET and flux tower measurements show strong agreement, with mean absolute



A satellite derived map showing evapotranspiration in the San Joaquin Valley for the 1990 season (Source: USGS)

errors ranging from 0.5 to 0.9 inches per month. A recent almond study found OpenET estimates within 13 percent of measured water use. However, some independent evaluations have reported larger discrepancies depending on crop type and environmental conditions.

“These tools are powerful, but they’re not infallible,” Oker noted. “Growers and water managers should always interpret remote sensing ET data with an understanding of model limitations and local context.”

## **A Rapidly Evolving Field**

Additional ET products, such as those offered by Land IQ, continue to expand the landscape of remote sensing options. As computing power increases and satellite technology advances, researchers anticipate even more accurate and timely ET models in the years ahead.

“Remote sensing is moving fast,” Oker said. “The potential for improving irrigation management is enormous, and we’re just beginning to see what’s possible.”

## **Contact**

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# Can a simple spray protect grapes from wildfire smoke?

*Joint UC Davis, USDA research is evaluating calcium spray and wine chemistry*



*Grapevines inside this hoop house, which is covered in screen cloth, were exposed to smoke. Photo by Gregory Urquiaga, UC Davis*

By Emily C. Dooley

Smoke from wildfires can alter grapes and affect the taste and sensory experience of wine, threatening California's \$88 billion industry as it faces an increase in fires on the horizon.

Researchers from the University of California, Davis, and U.S. Department of Agriculture spent this summer applying a calcium spray to grapes to see if the treatment can protect the fruit from smoke exposure.

"Wildfire smoke exposure can lead to something called smoke taint in wines and this is an unfavorable sensory outcome in the wines themselves that relate to smoky, ashy flavors," said Arran Rumbaugh, a USDA research chemist who works closely with the Department of Viticulture and Enology and helps mentor students. "We want to see how we can affect the absorption itself of smoke into the grapes by using a calcium spray."

Vineyard research

The experiment took place in the vineyard behind the Robert Mondavi Institute for Food and Wine Science where 10 cabernet sauvignon and chardonnay vines under hoop houses protected by shade screens were intentionally exposed to smoke produced from pellets made up of oak, grass, pine and other materials. A control group of vines were not exposed.

In grapes, calcium is known to support disease resistance, prevent cracking and strengthens skin and cell walls, said Arpa Boghozian, a doctoral student in the Department of Viticulture

and Enology at UC Davis, who helped design and lead the research.

The calcium spray was applied twice during the growing season as the veraison stage, which is when berries begin to ripen and reach full size, and two weeks later, Boghozian said.

"Our hypothesis was that by applying calcium we could further thicken the grape skin cell wall and decreasing absorption of smoke into the grapes," Boghozian said.

Samples of the exposed and control grapes were collected. Some were turned into wine for chemical analysis while hundreds of other grapes were peeled, punctured and tested.

"We're trying to understand with a puncture test did it actually strengthen the integrity," Boghozian said.

Chemical and texture analysis

This work carries on research by wine chemist Anita Oberholster, a Cooperative Extension specialist who died last year. Oberholster was an early researcher in smoke taint and developed innovative methods to test grapes for exposure. Rumbaugh worked in her lab and Boghozian did as well, though she primarily studies red blotch disease.

"It's been definitely really special to continue what Anita was passionate about and collaborate on research," Boghozian said.

Analysis is ongoing and the research team hopes to publish findings later this year or early 2027.



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# Electric Weed Control for Row Crops: A Practical Tool for Managing Herbicide-Resistant Weeds



**A**cross U.S. agriculture, herbicide-resistant weeds continue to challenge even the most carefully planned crop management programs. Growers are increasingly looking for practical tools that can complement chemical strategies while improving long-term weed control. One emerging approach attracting attention is electric weed control, a technology that destroys weeds by applying electrical energy directly to plant tissue rather than relying on herbicides.

Unlike smaller electric systems designed primarily for specialty crops, newer farm-scale equipment is being developed to integrate with standard tractors and operate within traditional row-crop farming systems. This allows growers to incorporate electric weed control into existing field operations while maintaining the scale and efficiency required for modern agriculture.

Electric weed control works by delivering controlled electrical energy through the plant structure. When the electrical current passes through the weed, it disrupts cellular structure and damages the plant internally, often reaching the root system. Because the process relies on physical energy rather than chemical application, it offers growers an additional tool for managing weeds that have developed resistance to commonly used herbicides.

Interest in alternative weed management approaches has grown steadily as resistant weed populations continue to expand across many crop regions. In addition to resistance concerns, growers are also evaluating long-term soil health, regulatory pressures, and the need for diversified weed control strategies within integrated weed management programs.

One example of this approach is LASCO's Lightning Weeder™, a tractor-mounted system designed to apply electrical energy to weeds during field operations. The equipment connects to standard farm tractors in the 50–250 horsepower range, allowing the technology to be used within the scale

and workflow of typical row-crop farming operations.

By integrating electric weed control into traditional field equipment, growers can potentially treat weeds during normal passes across the field. This compatibility with existing equipment is an important factor for many producers evaluating emerging technologies, as it allows them to explore new weed management methods without dramatically altering established farming practices.

Electric weed control is not intended to replace all other weed management strategies. Instead, many experts see it as a complementary tool within a broader integrated weed management approach. Combining mechanical, cul-

tural, chemical, and emerging technologies can help reduce reliance on any single method and improve long-term weed control outcomes.

Another factor driving interest in this technology is agriculture's broader trend toward electrification and alternative power systems. Electric motors, sensors, and precision control systems are increasingly appearing in agricultural equipment, opening the door for new approaches to field operations that rely less on chemical inputs and more on physical or electrical processes.

For growers facing increasingly complex weed management challenges, technologies such as electric weed control represent an additional option worth evaluating. As equipment manufacturers continue refining these systems and more field data becomes available, farm-scale electric weed management may become an increasingly visible part of modern row-crop agriculture. While still an emerging category, the development of tractor-integrated electric weed control systems reflects a larger shift toward diversified weed management tools that combine innovation with practical field application.

## About LASCO

LASCO develops electric-based weed control systems designed to provide growers with an alternative to chemical herbicides. Its Lightning Weeder™ utilizes an electric discharge system (EDS) to target weeds through applied electrical energy, supporting integrated weed management strategies while minimizing impact on surrounding crops. The company focuses on delivering practical, farm-scale solutions that can be integrated into existing agricultural operations, helping growers address weed resistance and evolving field management challenges. For more information about LASCO Lightning Weeder, visit: [www.lightningweeder.com](http://www.lightningweeder.com).

To support adoption during the growing season, LASCO is offering free setup and delivery for new systems through June 15.

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# The Fifth Annual Healdsburg Wine & Food Experience, May 14–17, 2026

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The Healdsburg Wine & Food Experience returns May 14–17, 2026 for a four-day celebration of Sonoma County's farmers, growers, winemakers, and chefs alongside acclaimed wines from leading regions around the world. Set among the vineyards and rolling hills of Healdsburg in California wine country, the festival highlights a culinary culture rooted in sustainability, seasonality, and a deep connection to agriculture.

The weekend opens with a Welcome Celebration at Appellation Healdsburg, the culinary-focused luxury hotel founded by Chef Charlie Palmer and Executive Chef Reed Palmer. The evening features dishes from chefs Maneet Chauhan and Duskie Estes alongside offerings from the Appellation culinary team, paired with curated wines.

A featured seminar, "150 Years of Beringer Vineyards," moderated by Ray Isle, executive wine editor of Food & Wine magazine, honors Napa Valley's longest continuously operating winery as it celebrates its 150th anniversary in 2026. Founded in 1876, Beringer Vineyards helped shape California wine. Pairings will be prepared by Charlie Palmer, Reed Palmer, and the Appellation Healdsburg culinary team.

Another seminar, "Don't Bust My Chops" Red Wine Loves Lamb, takes place at Arandas in Healdsburg. Moderated by wine educator Anthony Giglio, the session explores the science behind pairing red wine and lamb, featuring a tasting of red wines with lamb dishes prepared by XXVII North using lamb from the American Lamb Board.

Saturday's Grand Tasting (12:00–4:00 p.m., with VIP early entry from 11:00 a.m.–12:00 p.m.) will feature bites from nationally recognized chefs including Joe Sasto, Nadia Caterina Munno "The Pasta Queen," Viet Pham, Lee Anne Wong, and Britt Rescigno, while more than 150 local and international wine producers pour throughout the afternoon.

The Vintners Plaza Grand Tasting will showcase Willer Larreal of Sushi by Scratch Restaurants; Jeffrey Lunak of Sumo Dog; Mark Stark and Chef David Zimmerman of Stark Reality Restaurants featuring Willi's Seafood & Raw Bar; Todd Kneiss of Acme Burger; Kris Austin of A&M BBQ; Dino Moniodis of Dino's Greek; Carlos J. Mojica of Guiso Latin Fusion; Jake Rand of Sushi Koko; Ari Weiswasser of Glen Ellen Star, Stella, and Park Avenue Catering; and Sheana Davis of The Epicurean Connection.

Featured experiences include the Sushi by Scratch Restaurants Omakase Dinner Friday evening at Aperture Cellars and the Garden to Table Lunch at Kendall-Jackson Wine Estate & Gardens. Chef Willer Larreal will present an omakase-inspired tasting paired with wines from Founder and Head Winemaker Jesse Katz, named 2025 Winemaker of the Year by Wine Enthusiast. The Garden to Table Lunch features Executive Chef Tracey Shepos Cenami, Master Culinary Gardener Tucker Taylor, and Top Chef alum Maneet Chauhan.

Additional highlights include the Sommelier Showdown Dinner at Dry Creek Kitchen, where American and interna-

tional sommeliers compete to pair wines with a menu from Executive Chef Shane McAnelly alongside Chefs Charlie Palmer, Reed Palmer, and Daniel Kedan of the Culinary Institute of America. Moderated by Ray Isle, guests will vote for their favorite pairings.

Platinum VIP Weekend Package holders will enjoy a lunch at Ferrari-Carano Vineyards and Winery featuring fresh pastas by Nadia Caterina Munno "The Pasta Queen" and Italian dishes by Domenica Catelli, paired with Ferrari-Carano wines and selections from Chalk Hill Estate, Chateau St. Jean, Silverado Vineyards, Lancaster Estate, and Champagne PIAFF, with bites from Sam McKenzie, Culinary Director of Foley Family Wine & Spirits.

Friday morning, J Vineyards' Shifting the Lens series returns with a brunch hosted by Iron Chef, Top Chef, and restaurateur Stephanie Izard. Friday evening at MacMurray Estate, VIP guests will attend a seated Platinum Dinner featuring wines from Ravenswood Winery and live-fire cooking by chef Britt Rescigno.

The 5th annual outdoor concert at Rodney Strong Vineyards will feature Grace Bowers, the 19-year-old award-winning guitarist, singer, songwriter, and bandleader. Opening the evening is country music singer/songwriter Hannah Ellis, nominated for New Female Artist of the Year at the American Country Music Awards. Rodney Strong wines and food truck dinners will be available for purchase, with proceeds supporting Farm to Pantry.

The Big Bottle Party at The Matheson returns with large-format wines paired with late-night bites by Chefs Dustin Valette and Lee Anne Wong, plus a Sushi by Scratch Restaurants pop-up omakase tasting, wine lounges, caviar stations, and a dance floor.

Sunday concludes with the Sunday Wine-Down Pool Party at Appellation Healdsburg and the Pizza & Pinot Party at Copain Wines in the Russian River Valley, where Joe Sasto and Ari Weiswasser will serve handmade pizzas paired with pinot noir.

"As we mark our fifth year, we're proud of how the Healdsburg Wine & Food Experience has evolved into a platform that champions sustainability, culinary innovation, and agricultural heritage," said Steve Dveris, Founder and CEO.

Partners of the Healdsburg Wine & Food Experience include Kendall-Jackson Wine Estate & Gardens, Stonestreet Estate Vineyards, Ferrari-Carano Vineyards & Winery, FOOD & WINE, and founding partner Sonoma County Winegrowers. The Official Water is San Benedetto. The Reserve Lounge at The Matheson Rooftop is presented by First Citizens Bank and First Citizens Wealth.

About Healdsburg Wine & Food Experience – A four-day celebration of world-class food and wines showcasing farmers, growers, winemakers, and chefs alongside global wine regions through tastings, demonstrations, seminars, and events in Healdsburg and Wine Country.

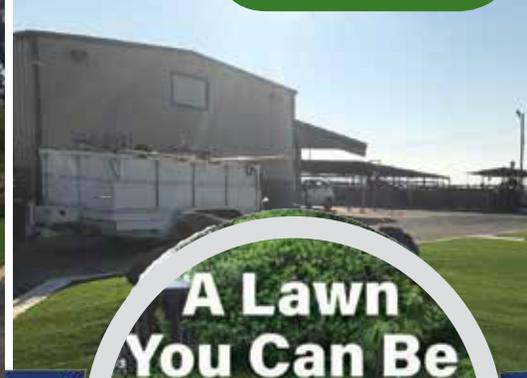
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## An Indoor Air Scrubber for Removing Ammonia in Poultry Houses



ARS Research Soil Scientist Philip Moore poses next to the indoor air scrubber. (Photo by Jerry Martin, ARS)

By: Jessica Ryan

Researchers from the USDA's Agricultural Research Service (ARS) are helping poultry farmers protect their flocks and their employees, while improving poultry production. ARS researchers recently developed an indoor air scrubber that purifies the air in chicken houses and reduces ammonia levels by 87% to 99%.

High levels of ammonia pose problems for poultry and agricultural workers. Ammonia, which is released from litter in poultry houses, reduces birds' body weight gain, causes poor feed conversion, and makes birds more susceptible to viral diseases. In addition, ammonia exposure can pose health risks to agricultural workers.

Poultry manure accounts for 27% of atmospheric ammonia emissions in the United States, representing a significant loss of nitrogen that could otherwise be used as fertilizer for crop production.

Currently, farmers use poultry litter acidifying amendments such as adding aluminum sulfate, known as alum, to litter to reduce ammonia levels in poultry houses. However, the amendments only last up to three to four weeks. Ammonia scrubbers offer an alternative solution; however, current systems only treat exhaust air. As a result, they provide no direct benefits to poultry production and are not cost-effective.

To find a more economical solution for farmers, researchers from the ARS Poultry Production and Product Safety Research Unit in Fayetteville, AR, designed and patented a full-scale prototype of an indoor air scrubber that can be easily installed in a poultry house to

purify the air and save valuable nitrogen. The scrubber has a fast sand filter that removes particulate matter from the scrubbing solution to prevent the nozzles from clogging – a problem that existing air scrubbers have in animal facilities with heavy dust.

"In study trials at our testing facility, our scrubber purified the amount of air in a 40 foot by 400-foot chicken house every 30 minutes and reduced ammonia levels by 87% to 99%, depending on the ammonia concentration and the air flow rate at which it is operated," said ARS Research Soil Scientist Philip Moore.

Moore and his research partners are planning to test the air scrubber in commercial poultry houses in the near future.

In addition to measuring ammonia levels, the researchers will look at how effectively the air scrubber can remove dust and pathogens from the air, such as viruses responsible for avian influenza and other pathogens that cause foodborne illnesses.

"This innovative technology could transform livestock production in poultry and potentially swine housing operations by improving animal welfare and worker safety, reducing disease transmission risks, and increasing farm profitability and environmental sustainability," said Moore.

The study was published in the *Journal of Applied Poultry Research* and done in collaboration with the ARS Poultry Research Unit at Mississippi State University, MS, and the University of Delaware's Department of Animal and Food Sciences.

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# \$115.2 Million Investment to Expand Timber Production and Enhance Forest Health in Eight States Announced

At the Advanced Bioeconomy Leadership Conference today, U.S. Department of Agriculture Administrator for the Rural Business and Cooperative Service J.R. Claeys announced the U.S. Department of Agriculture is guaranteeing \$115.2 million across eight states through the Timber Production Expansion Guaranteed Loan Program (TPEP) to ensure sawmills and other wood processing facilities have the necessary funding to establish, reopen, expand, or improve their operations.

Today's announcement includes recipients in the states of California, Idaho, Kansas, Louisiana, Maine, Oklahoma, Virginia, and Wisconsin.

These investments represent a commitment by the Trump Administration to expand American timber production by 25%, reduce wildfire risk, and save American lives and communities by strengthening domestic wood processing capacity.

"We cannot allow wildfires to devastate and destroy our rural communities," said Administrator Claeys. "That's why the USDA is taking bold action to stop the destruction of our forestlands by investing in sawmills and wood processing facilities that support sustainable timber harvesting. These actions strengthen local businesses, support rural prosperity, and create jobs for hardworking Americans."

A selection of project highlights from states receiving funding include:

\$12.3 million loan to Beachcombers, LLC in Oklahoma to acquire two Teal-Jones yellow southern pine sawmills, located in Antlers, Oklahoma, and Liberty, Mississippi. The first phase of the project is to restore the Antlers mill facility back to full operation, projecting an annualized production of 80 million board feet (mmbf). The second phase will bring the Liberty mill facility back online. The Antlers mill has a production capacity of 130 mmbf, while the Liberty mill has a capacity of 25 mmbf.

\$800,000 loan to Timber Professionals Cooperative Enter-

prises in Wisconsin to assist in re-opening a sawmill in Shawano County, Wisconsin. Timber Professionals Cooperative Enterprises will use guaranteed loan funds to purchase over 49 acres of real estate and equipment. The equipment will allow them to improve the efficiency of manufacturing wood chips. The project also includes plans to expand capabilities of the site to manufacture new, higher-value products from the same raw materials. The project will create six jobs, with additional staffing added as the sawmill expands.

"The value of National Forest Systems lands is demonstrated by providing various forest products, such as timber, lumber, paper, bioenergy, and other wood products," said U.S. Forest Service Chief Tom Schultz. "The American forest products industry is critical to maintaining the health of the nation's forests. The Timber Production and Expansion Guaranteed Loan Program is one of many ways the Forest Service partners with the timber industry to maintain rural jobs, processing facilities, and an outlet for wood that needs to be removed from national forests."

TPEP is made possible by a partnership between USDA's Rural Development and U.S. Forest Service. The program helps address the wildfire crisis by investing in local sawmills that clear out dangerous fuel in our forestlands, helping to remove the most immediate threats to communities, critical infrastructure, and natural resources. This program is available to qualified lenders whose loan applicants want to establish, reopen, expand, or improve a sawmill or other wood processing facility that processes ecosystem restoration byproducts from U.S. Forest Service National Forest System lands.

For more information on USDA Rural Development investments in rural America, visit the Rural Data Gateway. The Rural Data Gateway is an online tool that strengthens USDA Rural Development partnerships with rural people, entrepreneurs, government officials and Congress by making RD's investment data accessible to the public.

## Vacancies on the California Apiary Board Announced

The California Department of Food and Agriculture's (CDFA) Integrated Pest Control Branch is announcing two vacancies on the California Apiary Board. The vacancies are for registered beekeepers who reside in California and represent the industry functions of queen breeding, pollination, or honey production.

This Apiary Board makes recommendations to the CDFA Secretary on all matters pertaining to the beekeeping industry.

In accordance with Section 29023 of the Food and Agricultural Code, the Secretary shall take into consideration recommendations of the beekeeping industry, including, but not limited to, the California State Beekeepers Association.

The successful candidate will serve a term of four years as an advisory board member. The members receive no compensation but are entitled to payment of necessary travel

expenses in accordance with the rules of the Department of Personnel Administration. Members are considered public officials and must be willing to comply with necessary disclosure requirements.

Individuals interested in being considered for board appointment should send a brief letter of interest, a completed Prospective Member Appointment Questionnaire, and their resume to:

California Department of Food and Agriculture  
Integrated Pest Control Branch,  
1220 N Street, Sacramento, CA 95814  
Attn: Jennifer Berger

Or via e-mail to [Jennifer.Berger@cdfa.ca.gov](mailto:Jennifer.Berger@cdfa.ca.gov) with the subject line 'Apiary Board'.

For additional information, visit the branch's web page at: <https://www.cdfa.ca.gov/plant/pollinators/apiaryboard.html>

# 'One Farmer, One File' Initiative Launched to Better Support Farmers

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At the Commodity Classic Convention in San Antonio, Texas, U.S. Secretary of Agriculture Brooke L. Rollins announced the "One Farmer, One File" modernization, another action putting Farmers First with sweeping technological improvements at the U.S. Department of Agriculture (USDA). Through "One Farmer, One File," USDA's mission is to create a single, streamlined record that follows the farmer — no matter where they go in the USDA system.

"Every single day at USDA, our focus is on making life easier, more profitable and more rewarding for the American farmer," said Secretary Brooke Rollins. "Our government for the people by the people should be modern, efficient, and respect taxpayer dollars. This modernization of old, duplicative, wasteful systems has one goal in mind, improve our customer service so the people we serve are able to farm and feed America and the world. 'One Farmer, One File' prevents our farmers from duplicating tasks while increases their productivity and time in the field."

USDA's Farm Service Agency (FSA), Natural Resources Conservation Service (NRCS) and Risk Management Agency (RMA) work with agricultural producers on a wide range of programs and services, from establishing a farm number to reporting acres planted, and from getting capital to recovering from disasters.

The goal of "One Farmer, One File" is to reduce the administrative burden for farmers. Additionally, this effort will make pro-

gram delivery more efficient, save time for USDA staff, and decrease spending on disparate information technology systems.

The "One Farmer, One File" initiative is part of a broad modernization effort to unify all FSA, NRCS and RMA systems. This uniformed system will retire legacy systems and remove agency silos. USDA began work on this system in 2025 and plans to greatly advance the effort in 2026. USDA anticipates completing the project in 2028.

The "One Farmer, One File" initiative and broader modernization effort are just one example of how the Trump Administration is committed to simplifying and streamlining programs for producers. For example, USDA is using Login.gov to expedite Farmer Bridge Assistance (FBA) payments to producers. The Administration is also streamlining its conservation programs to make it easier for producers to bundle and apply for the practices needed on their farms.

While in San Antonio, Secretary Rollins also visited Texas Farm Bureau President Russell Boenig's farm to launch the Deregulatory Agenda for American Agriculture and Consumers (PDF, 5.6 MB) which is a package of deregulatory actions taken by the Trump Administration to cut red tape, unleash innovation, and increase affordability for farmers, ranchers, and consumers. In just one year, President Trump cut 129 regulations for every new one resulting in \$211.8 billion in net cost savings.

## Pre-proposals for the 2026 Fertilizer Research and Education Program grant cycle is being accepted

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The California Department of Food and Agriculture's Fertilizer Research and Education Program (FREP) is now accepting pre-proposals for the 2026 grant cycle. FREP's competitive grant program funds proposals that advance efficient nutrient and irrigation management practices that minimize environmental impacts through research, demonstration, education and training.

This year's priorities include: outreach, education, and demonstration projects focused on increasing the adoption of efficient crop nutrient and irrigation management practices and technologies; evaluating challenges and barriers to adoption of management practices; the role of organic input materials in soil nutrient management; demonstrating and/or validating management practices that optimize nutrient and/or irrigation water use; filling knowledge gaps for nutrient and irrigation management in specific crops; understanding nutrient movement from the root zone; and mitigation strategies to reduce nutrient losses.

California's agricultural communities are diverse and many have historically lacked access to resources and information needed to help them successfully run their businesses. CDFA encourages projects that include demonstrable benefits for

socially disadvantaged farmers and farm workers, including groups whose members have been subjected to racial, ethnic, or gender discrimination.

Applicants are invited to submit pre-proposals to FREP by April 27, 2026. Pre-proposals should be aligned with at least one of the identified funding priorities and use the provided pre-proposal template. Further information on the 2026 FREP RFP, including timelines, funding priorities, and templates are available on the Grant Program web page at [www.cdfa.ca.gov/is/ffldrs/frep/CompetitiveGrantProgram.html](http://www.cdfa.ca.gov/is/ffldrs/frep/CompetitiveGrantProgram.html)

All pre-proposals will be reviewed by the Fertilizer Inspection Advisory Board's Technical Advisory Subcommittee (TASC). Applicants whose pre-proposals are selected by TASC will be invited to develop full proposals.

Since 1990, FREP has funded more than 280 projects, investing over \$32 million in research, outreach, and education projects focusing on irrigation and nutrient management practices in California. A database of completed and ongoing research is available on the FREP Research web page at [www.cdfa.ca.gov/go/FREPresearch](http://www.cdfa.ca.gov/go/FREPresearch)

For more information, please send email inquiries to [FREP@cdfa.ca.gov](mailto:FREP@cdfa.ca.gov).



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