THE ADVISER

California Association of
Pest Control Advisers

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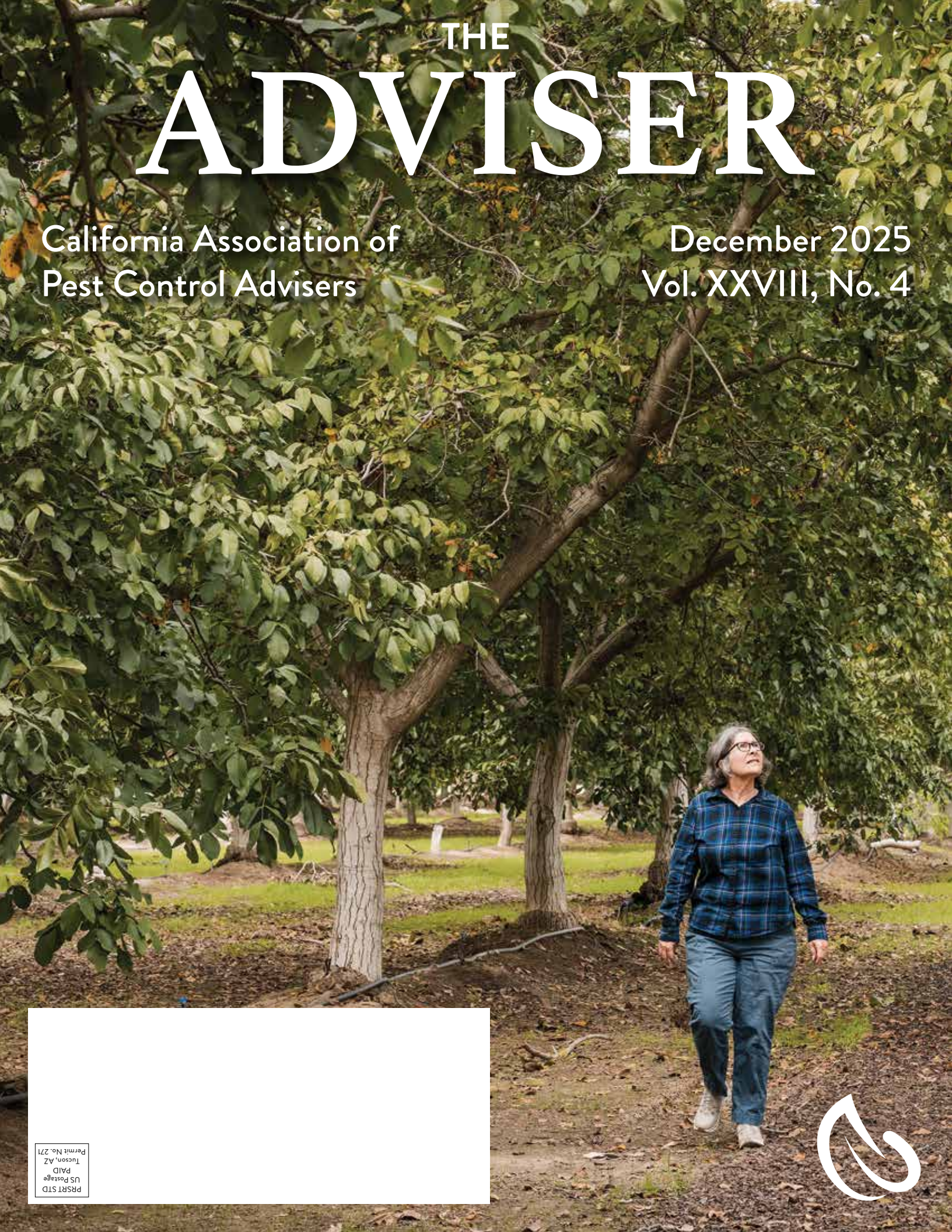

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CONTENTS

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FEATURES

DEPARTMENTS

MISSION & PURPOSE: California Association of Pest Control Advisers (CAPCA) is a non-profit voluntary mutual benefit association that represents 75% of the 4,000 California EPA licensed pest control advisers. CAPCA's purpose is to serve as the leader in the evolution of the pest management industry through the communication of reliable information. CAPCA is dedicated to the professional development and enhancement of our members' education and stewardship which includes legislative, regulatory, continuing education and public outreach activities.

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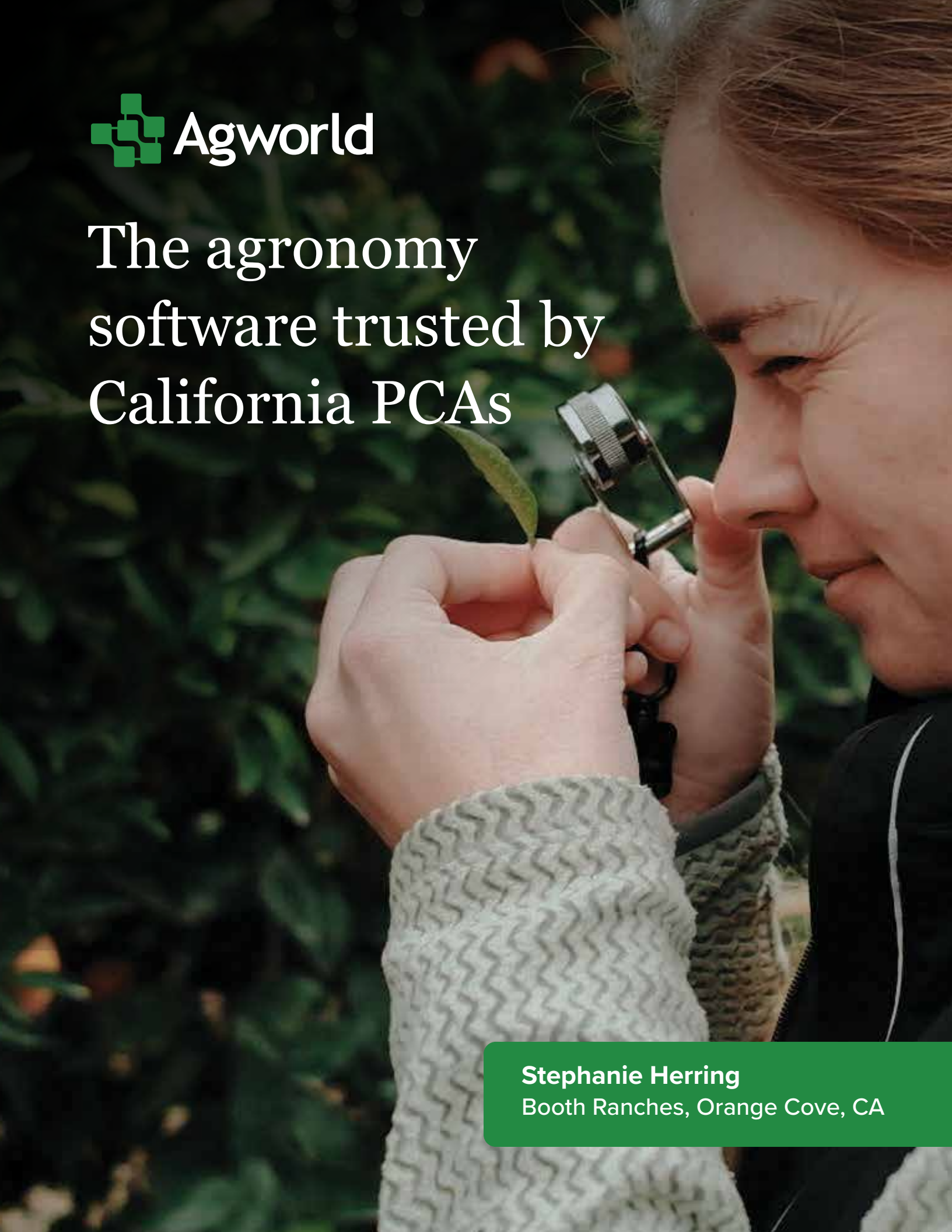
Agworld
The agronomy software trusted by California PCAs
Stephanie Herring
Booth Ranches, Orange Cove, CA

Celebrating a Year of Leadership, Growth, and Community Impact

As we wrap up another year of CAPCA engagement, I wanted to take a moment to recognize the efforts of all our CAPCA Leadership from the CAPCA Board and statewide Committees to local Chapter Boards. Volunteers who are working to serve their profession and the membership – who find belonging and value in participating alongside their association peers at CAPCA. Your leadership is the heart of CAPCA.

Much like previous years, our CAPCA Board, Chapter Leadership and Membership have been busy! Throughout the past year, CAPCA has held over 30 Board and Committee meetings to drive the direction of CAPCA member-focused benefits and initiatives. Special Committees for the year included the Demographic Survey Committee and the CAPCA Forward Committee who looked to the future to design a roadmap to serve us through the next decade. Visit page 25 to learn more about how you can participate in the Demographic Survey right now! While the Board and Committees provide the guidance for the CAPCA team to execute daily operations, the overall vision is led by your peers—fellow PCAs who volunteer their time to ensure the ongoing success of the association.

Across California, our 15 Chapters hosted over 45 hours of CE locally. In combination with CAPCA Spring Summit and CAPCA Annual Conference, CAPCA members had access to more than 75 hours of quality in-person CE to support their professional CE renewal requirements. We boasted another 25 hours of online CE, including a sponsored program by CDFA on Invasive Fruit Fly.

The Advocacy Committee monitored a wide range of bills throughout the session, ultimately narrowing our engagement focus to four key pieces of legislation. See page 34 for a broader breakdown of Advocacy Committee engagement this year.

The CAPCA Annual Conference drew nearly 1,000 attendees. In just the Exhibit Hall alone, we served nearly 2000 cups of coffee throughout the day on Sunday and Monday and over 300 cold drinks during our new Sunday snack break. This successful addition was designed to give attendees more time in the Exhibit Hall between CE during the Sunday program.

Coffee wasn't the only thing served up at the Conference. In addition to the 19.5 hours of continuing education, we experienced an unexpected CE audit conducted by the Department of Pesticide Regulation. During this audit, they reviewed how we monitor by having participants scan in and out to verify attendance and engagement. Your compliance with the scanning system and process is the standard they want to see for hours tracking!

Ruthann Anderson, Editor
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Ruthann Anderson
CAPCA CEO

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Editor's Notes

Advancing CAPCA:

Inside the Latest Issue of The Adviser

Ashley Hinson, Managing Editor

Hello Advisers!

If you're flipping to this page expecting Patrick, you might be wondering, "Who's Ashley Hinson?" Well, allow me to step out from behind the curtain and introduce myself: I've been with CAPCA for 5 years coming January 1st, and I've been working in the background on online CE, the Advice for the Adviser podcast, wrangling the CE program at CAPCA Conference, and other content-related things. I'm excited—and maybe a little nervous (if coffee consumption is any indication!) — about taking on The Adviser. This is my first issue fully at the helm, and I couldn't be more thrilled to connect with all of you, CAPCA's passionate community of PCA professionals and advocates.

The following is a sneak peek at what's waiting for you in this issue. First up: Advocacy updates from 2025. The policy landscape in agriculture is shifting, and we're here to keep you in the know. From policy changes in the legislature to grassroots wins that you helped make possible, the advocacy stories in this issue have challenges, victories, and even a few plot twists (no spoilers here—turn a few more pages to find out the details!).

This issue also features a stellar lineup of articles—think of it as an all-you-can-read buffet for your brain. Our contributors tackle topics that matter like biopesticides and DPR's Pesticide Use Report, ag ditch habitat, and fungicide resistance, among other topics. If you're looking for fresh perspectives, actionable advice, or just a reason to refill your coffee, you'll find it within these pages.

Now, let's shine a spotlight on the PCA's role in Sustainable Pest Management (SPM). This month, a couple features take a deep dive into how PCA's use SPM every day in the field. Whether you're a new PCA or a seasoned pro, you'll likely enjoy these articles, backed by lots of data. Check out the article on the CDFA Grant data and Dr. Rosenheim's summary article of his recent work on PCA bias around writing recommendations. I'm personally fascinated by these data sets, and I think you will be too.

As I settle into this new role, I want The Adviser to feel like a conversation—one that invites your thoughts, feedback, and even your constructive critiques. Connect with me and the CAPCA team with your ideas, questions, or just to share a great joke; after all, The Adviser is your magazine, and your voice matters here.

I'm grateful to take this new role at CAPCA in support of the PCA community. Here's to you and your profession, to better advocacy, and maybe—just maybe—a few less typos than usual. Until next issue, keep advising and keep inspiring! ■

Warmly and with caffeine,

Ashley

Leading the Way: The Power of Your Voice

CAPCA's Vision for Advocacy, Leadership, and Member Engagement

Matt Bristow, CAPCA Chair

As I wrap up my first year as Chair of CAPCA, I find myself reflecting on the profound impact our organization has on the daily lives of Pest Control Advisers across California. Having attended countless committee and board meetings, as well as weekly discussions with our CEO, Ruthann Anderson, I've gained a deeper understanding of the regulatory complexities and the vital network of connections that the CAPCA team fosters and maintains to support our professional licenses.

Despite my close involvement in this process, I'm still regularly reminded how much happens behind the scenes to advocate for our profession. Being focused in the field, I wouldn't hear about 99% of the issues that the organization is busy dealing with on our behalf if I were not in the position I am. Much like pest control, it's best to get ahead of the problem and utilize preventative measures so it doesn't blow up. I recently had a conversation with DPR Director Karen Morrison that underscored just how nuanced and far-reaching CAPCA's efforts truly are. Having the organization actively scouting for issues in Sacramento means I can stay focused on my job. CAPCA's attention and expertise on these matters means I can trust that my interests—and those of every PCA—are being championed, even when I'm not physically at the table.

For more than fifty years, CAPCA has been the vanguard of our industry, ensuring PCAs have a voice and maintaining a pathway of professionalism. Our focus remains unwavering: advocating on behalf of Licensees in legislative and regulatory matters, delivering high-quality education, fostering professional networking, providing innovative tools, and supporting PCAs so they can concentrate on what they do best—serving growers and the environment.

In the face of industry changes and external challenges, CAPCA stands firm. We've invested in technology that streamlines compliance and recordkeeping—relieving you of extra time and labor while keeping everyone in line with new requirements. Our partnership with over 300 meeting sponsors means your continuing education hours are tracked and reported seamlessly. Look for the green checkmark at your next meeting for peace of mind.

Our association is built for you, by you. CAPCA is not just a board or a staff—it's every member working together to protect the integrity and future of the PCA license. This year, we've responded to unique pest pressures, advocated for legislative solutions, and fostered local engagement with the formation of the Sacramento Valley Chapter. Through collaboration with regulatory agencies and commodity groups, we continue to amplify your voice in Sacramento and beyond.

As we prepare for upcoming audits and regulatory reviews, CAPCA is ready to defend your license and demonstrate the professionalism that defines our community. I encourage every member to get involved, whether through committees, local chapters, or simply sharing your perspective.

On page 25 of this issue, you'll find a feature on CAPCA's demographic survey—a powerful tool that guides CAPCA's future initiatives. Your participation will shape our advocacy, education, and support programs for years to come. Please take the time to fill it out and, together, we ensure that the future of pest management remains strong, respected, and resilient. ■

CAPCA

Thank You for Another Great Year

by Katrina Silver, CAPCA Director of Business Operations

As we wrap up 2025, the CAPCA team wants to take a moment to thank you—our members—for your continued support, engagement, and dedication to the profession. Each year, your membership strengthens CAPCA's ability to advocate for license holders, deliver high-quality continuing education, and provide trusted resources that support your profession. You are the reason CAPCA can continue to serve as the voice of the PCA license and a champion for California agriculture.

We were proud to gather with so many of you this fall at the CAPCA Annual Conference and Agri-Expo in Reno. It was an incredible opportunity to connect, learn, and celebrate the impact our members make every day. Your involvement reinforces what makes CAPCA special—a professional community built on shared purpose, professional growth, and leadership in agricultural pest management.

As the year winds down, it's time to ensure your CAPCA membership is renewed for 2026. Renewing early guarantees uninterrupted access to your member benefits. For even more convenience, CAPCA now offers auto-renewal, allowing your membership to renew automatically each year. Once enrolled, your payment and renewal process are handled securely, saving you time and ensuring you never miss a benefit or lapse in your membership.

Your membership investment directly supports:

- Advocacy that protects and advances the PCA license.
- Education that upholds the highest standards of professional practice.
- A community that connects PCAs, CCAs, QALs, QACs, and partners across the state.
- Resources that simplify your compliance and enhance your professional development.

We encourage all members who need assistance with their membership renewal or CAPCA DPR renewal summary to contact the CAPCA office before December 19th, as the office will be closed for the holiday break.

As we look ahead to 2026, we're excited to continue building on our progress together—expanding online learning opportunities and enhancing the tools that support you and your license.

On behalf of the entire CAPCA team, thank you for being part of this incredible community. We wish you and your loved ones a joyful holiday season and a safe, prosperous New Year! ■

Cultivating Health and Growth: CAPCA Partners with UnitedAg to Bring Exclusive Membership Benefits to Advisers

Strengthening Agriculture in California and Arizona

The California Association of Pest Control Advisers (CAPCA) is proud to announce a new partnership with UnitedAg, a member-owned agricultural trade association dedicated to advancing the health and well-being of the agricultural community. Through this collaboration, CAPCA members now have the opportunity to join UnitedAg at a discounted membership rate of $300, plus a one-time initiation fee.

For more than 45 years, UnitedAg has served as a trusted resource for agricultural employers and their employees—delivering comprehensive, affordable healthcare solutions and championing the needs of the industry. This partnership reinforces a shared commitment to supporting agriculture in California and Arizona, fostering collaboration, innovation, and member-driven value across the region.

Benefits of UnitedAg Membership

UnitedAg offers its members a broad range of benefits and services designed to meet the unique needs of the agricultural industry, including:

- Comprehensive Health Benefit Solutions – Access to innovative, cost-effective national medical networks, as well as dental and vision plans tailored for agriculture-based employers.
- Health & Wellness Centers – Six UnitedAg Health & Wellness Centers located throughout California provide same-day appointments, bilingual staff, and personalized care at little to no cost.
- Education & Leadership Programs – Members benefit from workshops, roundtables, and leadership academies that foster growth and professional development, as well as vocational and educational scholarships through UnitedAg's educational foundation, AEF.
- Community & Collaboration – Opportunities to connect with peers and industry leaders, and access discounted pricing for courses provided by AgSafe and APMA, supporting continued learning and compliance across the agricultural workforce.
- Advocacy & Representation – UnitedAg represents the agricultural community on key legislative and regulatory issues, ensuring the voices of members in both California and Arizona are heard.

A Shared Vision for Regional Strength and Sustainability

Both CAPCA and UnitedAg share a vision of empowering agricultural professionals to succeed through access to quality healthcare, education, leadership development and advocacy. By offering CAPCA members discounted membership, this partnership helps strengthen the agricultural workforce and promotes a healthier, more resilient future for the industry across California and Arizona.

Join Today

Join today—contact the UnitedAg Membership Team and take advantage of this exclusive offer.

(800) 223-4590 | www.unitedag.org

Together, CAPCA and UnitedAg are cultivating a stronger, healthier agricultural community—one member at a time. ■

51 Annual CAPCA Conference & Agri-Expo

By Ryan Dana, CAPCA Event Coordinator

CAPCA's 51st Annual Conference, "Where the Future of Pest Management Takes Root," was a resounding success. Nearly 1,000 Pest Control Advisors (PCAs) and industry representatives gathered to engage in advanced continuing education sessions, connected with 103 of the industry's leading companies in the exhibit hall, and networked with peers and partners from across the agricultural community. The atmosphere was vibrant and collaborative, reflecting the shared commitment of attendees to advancing pest management through innovation, education, and professional growth.

This year's program featured 40 speaker sessions over 2.5 days, offering participants the opportunity to earn 19.5 California DPR continuing education credits toward their PCA licenses. The Almond Board of California and Western Growers Association sponsored the opening day of the general sessions, setting an informed and forward-looking tone for the rest of the conference.

CAPCA extends our appreciation to all event sponsors, whose generous support makes the scale of an event like this possible, and to our Title Sponsor, Bayer, whose continued partnership underscores a shared commitment to advancing the PCA profession.

The Exhibit Hall served as a true hub of innovation and engagement, with over 100 exhibiting companies showcasing the latest technologies, products, and research shaping the future of pest management. Special thanks to Syngenta for sponsoring this year's Exhibit Hall and to all exhibitors who contributed their time, expertise, and insights.

New features added fresh energy to the experience, including Family Hour, when attendees were invited to share the Exhibit Hall with their families. We increased the number of CE breakout sessions hosted directly on the exhibit floor on Sunday and Monday. Attendees also enjoyed a new addition, the Coffee Counter, providing all-day coffee service thanks to the generous sponsorship of AgroLiquid, TELUS, and Tessenderlo Kerley.

ce Recap

Corteva Agriscience

Raises $1,384 for the Stanley W. Strew Trust

The Sunday Exhibit Hall Happy Hour was a lively highlight, giving attendees and exhibitors alike a chance to unwind and connect over refreshments.

Sunday evening concluded with Nichino's sponsorship of the Welcome Reception on the pool deck, featuring carving stations, drinks, and an inviting outdoor atmosphere. This year's event set a new benchmark for future conferences—both in attendance and in the memorable sense of community it created.

Corteva Agriscience continued its steadfast support for the next generation of agricultural professionals by raising $1,384 for the Stanley W. Strew Trust, which provides scholarships for students pursuing careers in pest management. During the Student Networking Event, students connected directly with PCA mentors, industry leaders, and potential employers—continuing CAPCA's mission to foster career growth and strengthen the future of California's agricultural and landscape industries. In addition to Corteva Agriscience's support of the Stanley W. Strew Trust, AgroSpheres, FMC, Gowan, Grow West, Helena Agri-Enterprises, and Semios + Agworld all sponsored the Student Network Event.

At the Monday Luncheon, sponsored by Wilbur-Ellis, CAPCA recognized individuals whose contributions embody excellence and leadership in pest management. You can see the write up for CAPCA Member of the Year and Outstanding Contribution to Ag Award winners on pages 16-17.

Additionally, CAPCA's 2025 Chapter of the Year was recognized for its exceptional commitment to professional development and member engagement. Congratulations to the Desert Valleys Chapter!

The 51st Annual CAPCA Conference was far more than a professional gathering—it was a celebration of progress, partnership, and purpose. Through shared knowledge, collaboration, and innovation, CAPCA continues to strengthen the foundation of California agriculture and ensure a thriving future for the pest management profession.

Thank you to everyone who joined us in Reno for an unforgettable event. We look forward to welcoming you to the 52nd Annual CAPCA Conference in Anaheim, October 11–13, 2026, where we will continue to grow the future of our industry together.

2025 CAPCA CONFERENCE RECAP


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Michael D. Rethwisch: A Champion for California Agriculture

Honoring the 2025 CAPCA Outstanding Contribution to Agriculture Award Recipient

For nearly four decades, Michael D. Rethwisch has stood at the forefront of agricultural innovation and advocacy, leaving an indelible mark on California's farming communities and beyond. In recognition of his exceptional career and unwavering commitment, the California Association of Pest Control Advisers proudly names Michael as the recipient of the 2025 Outstanding Contribution to Agriculture Award.

Michael Rethwisch (right) receives his award from Paul Crout

Currently serving as a Farm Advisor with the University of California Cooperative Extension in Riverside County, Michael's work addresses some of the most complex challenges facing modern agriculture. His expertise spans disease and pest management, irrigation/water management, and abiotic stress mitigation across a wide variety of crops, including vegetables, forage, fiber, hay, and seed. Through innovative research and problem-solving, Michael has become a trusted advisor to growers, crop protection manufacturers, and extension specialists throughout California and the Western United States.

Michael's career is defined by a series of pioneering achievements. Notably, he was the first to identify lettuce as a host for the American serpentine leafminer (Liriomyza trifolii), a discovery that helped mitigate significant economic losses in low desert lettuce production. In 2018, he was part of the team that documented the first occurrence of pyrethroid resistance in alfalfa weevils in the low desert—a breakthrough that informed new pest management strategies and product registrations. His field efficacy trials have directly influenced many new product approvals and label expansions, benefitting agriculture across the region.

Beyond his technical contributions, Michael is celebrated as an alfalfa expert, with research appearing in more than 250 publications, book chapters, and technical reports. His insights are frequently sought at local, state, and national meetings, including speaking engagements.

Michael's passion for agricultural education is equally remarkable. He has coached several national championship-winning 4-H Horticulture teams, inspiring the next generation of industry leaders. Michael continues to advocate for youth involvement and professional development in agriculture.

His local impact is felt through monthly meetings he organizes for the Progressive Farmers organization in Blythe, where he brings together growers, PCAs, and community members to discuss the latest research and best practices. Michael's dedication to outreach and advocacy underscores his holistic approach to agricultural advancement—one that values collaboration, education, and community engagement.

Nominated by the Desert Valleys Chapter, Michael D. Rethwisch's decades of service exemplify the spirit of innovation and integrity that CAPCA's Outstanding Contribution to Agriculture Award seeks to honor. With deep respect and admiration, the industry celebrates Michael's achievements and looks forward to his continued leadership in shaping the future of California agriculture. ■

Mando Perez:
2025 CAPCA Member of the Year

A Decade of Dedication to Sustainable Agriculture and Community Growth

In the heart of California's agricultural landscape, one name stands out as a beacon of dedication, innovation, and advocacy: Mando Perez. With over ten years of experience in pest management and sustainable farming, Mando's journey in agriculture is a testament to the power of commitment and community leadership. This year, his extraordinary contributions have been recognized with the distinguished 2025 CAPCA Member of the Year Award, an honor reserved for those who go above and beyond in service to their profession and peers.

Currently serving as a Sales Director for Semios, Mando leverages his expertise as a Pest Control Adviser and Qualified Applicator license holder to help growers implement advanced crop protection solutions. His approach is rooted in the latest technology, ensuring that farmers have access to innovative tools that drive efficiency and sustainability. Through his role, Mando not only enhances agricultural practices but also fosters a culture of progressive thinking within the industry.

Beyond his professional responsibilities, Mando's impact is felt at CAPCA's organizational level. As the President of the Kern County CAPCA local chapter, he leads with vision and passion, advocating for industry advancement and supporting local agricultural boards. His influence extends to policy discussions and the promotion of best practices, reflecting his deep commitment to both growers and the future of agriculture.

What truly sets Mando apart is his unwavering support for the next generation of agricultural professionals. He is a proud advocate for the Student Networking Event and consistently engages in outreach efforts to inspire future PCAs. Through social media, local chapter events, and hands-on volunteer work, Mando shares his journey and encourages students to embrace the many opportunities within the agricultural sector. His mentorship and enthusiasm have helped cultivate new talent and foster a sense of community among industry peers.

Mando Perez (left) receives his award from Paul Crout

Colleagues describe Mando as a driving force behind Kern County's agricultural progress, always ready to lend his expertise, share his story, and champion the values of the ag industry. Whether coordinating events, leading board initiatives, or volunteering in the community, Mando embodies the spirit of CAPCA: leadership, service, and continuous learning.

Receiving the 2025 CAPCA Member of the Year Award is a well-deserved recognition of Mando Perez's outstanding volunteerism, leadership, and commitment to advancing modern agriculture. His achievements not only uplift the industry but also inspire those around him to pursue excellence, innovation, and collaboration. As Mando continues to make a difference—one field, one student, and one community at a time—he sets a powerful example for all who strive to leave a lasting impact in California's agricultural legacy.

Congratulations, Mando Perez, for being honored as CAPCA's Member of the Year and for your relentless dedication to the growth and sustainability of our agricultural future. ■

Desert Valleys Chapter Honored as CAPCA's 2025 Chapter of the Year

The CAPCA Desert Valleys Chapter has been honored with the prestigious Chapter of the Year Award at the 51st Annual Conference and Agri-Expo in Reno, NV. This recognition celebrates the Chapter's outstanding commitment to continuing education, student outreach, and advocacy for the agricultural industry.

This achievement is a true reflection of the dedication, teamwork, and leadership demonstrated by the Chapter's officers and volunteers — including President and Co-Treasurer Bryan McCleery, Vice President Kyle Kuechel, State Chairman Matt Bristow, Secretary and Co-Treasurer Victoria Clark, and Directors Hector Garcia, Chris Denning, James Ellsworth, Victor Lopez, and Ralph Evans Jr.

A special thank you goes to Victoria Clark and Kyle Kuechel, whose energy, vision, and commitment were instrumental in guiding Desert Valleys to this well-deserved 2025 success.

This year, the Chapter reached impressive milestones — hosting 11 meetings, collaborating with multiple universities and colleges across Southern California to expand scholarship opportunities, and achieving a record number of scholarship applicants. Their efforts resulted in the awarding of two high school scholarships and six college scholarships, supporting the next generation of agricultural professionals.

Congratulations once again to the Desert Valleys Chapter on this outstanding accomplishment! ■

Thank You to Our 2025 Student Network Event Sponsors

We extend our sincere appreciation to our 2025 Student Network Event Sponsors for their generous support and commitment to cultivating the next generation of Pest Control Advisers and agricultural professionals. Your partnership plays a meaningful role in the continued success and growth of this program.

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CAPCA and the Stanley W. Strew Foundation would also like to recognize Krista Tavares for her outstanding leadership and dedication as the Student Network Event Coordinator. Her efforts were instrumental in creating an engaging and impactful experience for participating students and industry partners.

Thank you for helping inspire and support the future leaders of our industry.

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Your generosity helps cultivate the next generation of licensed Pest Control Advisers.

Your Contribution Fuels:

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- Resources for local CAPCA chapters to engage and mentor students
- Outreach to colleges to connect talent with PCA careers

Together, we're empowering future PCAs and strengthening the agriculture community.

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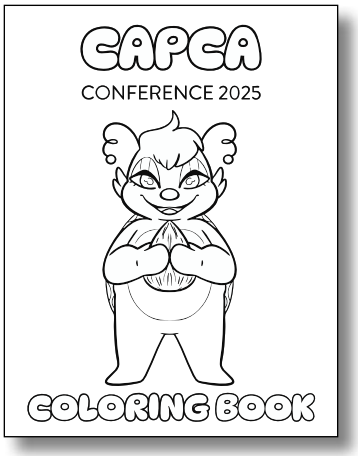

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A Strong Finish in Reno and a Look Toward 2026

by Katrina Silver, Director of Business Operations

As we wrap up another successful Annual Conference and Agri-Expo in Reno, Nevada, we're proud to share a little behind-the-scenes look at the team effort that made it all happen.

While CAPCA's small staff is involved in year-round planning to support our signature event, this year marked a meaningful milestone: all seven team members were on-site in Reno, working together to deliver an event experience that reflected the professionalism and dedication of the entire association.

Our staff wore many hats throughout the event—managing continuing education logistics, overseeing registration, coordinating speakers and volunteers, supporting sponsors and exhibitors, and keeping meals and receptions running smoothly. That level of collaboration only works when a team understands both the broader goals and the finer details, and we're proud to say our team did exactly that.

We were honored to receive overwhelmingly positive feedback from members, sponsors, and exhibitors. The CAPCA team was praised for being professional and friendly—whether helping at registration, answering questions, or assisting throughout the venue. We strive to create an environment where our members and partners feel supported every step of the way, and we're proud that this year's event delivered on that goal.

With the conference behind us, we're turning our attention toward fall priorities and the year ahead. That means closing out final 2025 projects and setting the groundwork for 2026 goals—from membership engagement to operational improvements and early planning for next year's annual conference in Anaheim.

Throughout it all, we remain committed to the core values that guide our work: service to our members, advocacy for the license holders, excellence in execution, and a collaborative team culture that supports one another in the face of challenges and change.

Thank you to every attendee, sponsor, and exhibitor who joined us in Reno. Your presence made this year's conference a success and a celebration. And thank you to our incredible team for showing up, pitching in, and making it happen—together.

We're proud of what we've accomplished and excited for what's ahead. ■

Online CE

2025 ONLINE CE COURSES & BUNDLES NOW AVAILABLE!

Anyone can create a free account to view CAPCA's CE course catalog.
Once purchased, users have access to courses through 12/31/25.
Over 20.0 total DPR-approved hours available, with some FREE DPR hours available to all CAPCA.com users and exclusive free hours for CAPCA members!

FREE COURSES:

Invasive Fruit Flies in California – $0 – FREE to all users
1.0 DPR Hours (Other)
The California Department of Food and Agriculture (CDFA) is offering a new CE course designed specifically for PCAs and other industry professionals focused on invasive pest management. This course provides an in-depth look at the rising pressure of invasive fruit flies (IFF) across the state and the critical role PCAs play in early detection and containment. This CE course is available at no cost and is an essential resource for PCAs looking to stay informed and proactive in protecting California's agricultural economy. Participants will:

- Understand the pest profiles of major IFF species affecting California
- Learn the triggers that initiate state quarantines
- Explore best practices for supporting growers with timely, science-based recommendations
- Review the 2023–2025 IFF response strategies
- Discover innovations shaping the future of pest detection and management

How PCAs Participate in the CDFA SPM Grant with Crop Steward – $0 – FREE to all users
1.0 DPR Hour (Other)

- Learn how to use CAPCA's Crop Steward App
- In-field support for grant participants
- Eligible participants receive a $2,000 stipend at season's end!

Industry 101 – $0 – FREE to 2025 CAPCA Members
1.0 DPR Hours (Laws)
Includes:

- PPE & Health Effects for Workers – Ben Laverty IV
- Updates on Soil Fumigant Application Requirement – Dr. Rais Akanda
- Why is Weed Management So Difficult? – Dan Wickham

Industry 101, Part 2 – $0 – FREE to 2025 CAPCA Members
2.0 DPR Hours (1.5 Laws, 0.5 Other)
Includes:

- Spray Safe 101 – Ruben Arroyo and Louie Mendoza
- How to be Prepared to Defend a Violation – Robert Atkins

2025 Product Profiles – $0 – FREE to 2025 CAPCA Members
1.0 DPR Hours (Laws)
Includes:

- Platform10 Technology and Biological Solutions – Jeana Cadby
- Most trap networks are broken - let us share why – Donat Posta
- Ecorobotix ARA: Ultra-High-Precision Spraying benefits – Blake Farris
- PCAs Who Develop and Adopt New Technologies Will Benefit Their Growers – Patrick Dosier

COURSES FOR PURCHASE:

Alternatives + Weed Control – $40
2.0 DPR Hours (Other)
Includes:
- Landscape and Turfgrass Weeds and Control Options – Krystal Abbott
- Mixing and Loading in the 21st Century – Dr. Kevin Caffrey
- The Winery says "No glyphosate;" What are your options? – John Roncoroni
- Biologicals 101 – Jose Ramirez

Updates & Regulatory Landscape – $50
2.5 DPR Hours (0.5 Laws, 2.0 Other)
Includes:
- CACASA Update – Jose Arriaga
- Digitalization of Label Information & Bringing Ag into Modern Times – Sarah Hovinga
- A Sustainable Future for Pest Management – Dr. Karen Morrison
- PCAs Who Develop & Adopt New Technologies Will Benefit Their Growers – Patrick Dosier
- CEQA: Yesterday, Today & Tomorrow – D. Wickham

Specific Pest Updates – $50
2.5 DPR Hours (Other)
Includes:
- CA Invasive Fruit Fly Update – Dr. Jason Leathers
- Identification & Control of Emerging Pests in Urban Landscapes – Dr. Chris Shogren
- Mosquito Control Update – Laura Krueger
- Successful Mitigation of Pests that Threaten Ag in the Conurbation Environment of So. CA – Dr. John Kabashima

Pests in Crops – $70
3.5 DPR Hours (Other)
Includes:
- Non-Fumigated Nematicides for the Managing of Root-Knot Nematodes in Carrots & Other Vegetable Crops – Dr. Jaspreet Sidhu
- Principles & Practices in Disease Management in CA Strawberries & Beyond – Dr. Gerald Holmes
- Soil-borne & Insect-vectored Diseases in Processing Tomatoes & Cucurbits – Dr. Zheng Wang
- Ensuring Correct Disease Identification when Managing Field Pests – Allie Cushnyr
- Routes of Insecticide Activity in Crops – Dr. Jesse Richardson
- Managing Aloe & Agave Mites – Dr. Eric Middleton

Nuts & Trees – $30
1.5 DPR Hours (Other)
Includes:
- Invasive Carpophilous Beetle in CA's Nut Crops – Dr. Jhalendra Rijal
- Pest & Disease Research Update: Pistachios – Steve Vasquez
- Climate-resilient Tree Species for CA Landscapes – Janet Hartin

Trees, Nuts, & Citrus Pests – $60
3.0 DPR Hours (Other)
Includes:
- Spring Tree Disease Insights – Dawn Fluharty
- Hemipteran Insect Pest Mgmt. – Dr. Sudan Gyawaly
- Almond Canker – Dr. Florent Trouillas
- European Earwigs in Citrus – Dr. Jay A. Rosenheim
- Walnut Husk Fly Control – Dr. R. Van Steenwyk

PCA Best Practices – $40
2.0 DPR Hours (Other)
Includes:
- Keep Your Head on a Swivel – Mike Blankinship
- Benefit with Biologicals – Jose Muro
- Spray Guidance via Temperature Inversion – Mark Battany

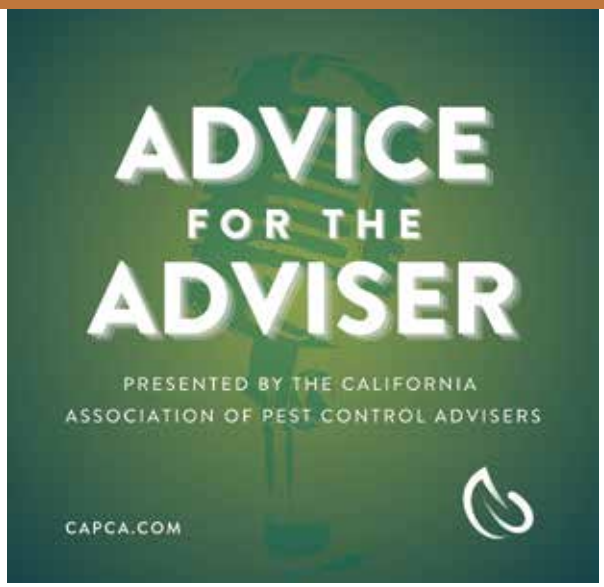
NorCal Focus – Vines, Tomatoes, & Rice – $40
2.0 DPR Hours (Other)
Explore pest management innovations in key Northern California crops.
Includes:
- Mealybug Control: Mating Disruption & Pesticides – Dr. Kent Daane
- Fungal Disease Management in Tomato – Brenna Aegerter
- Rice Pest Management Updates – Dr. Whitney Brim DeForest

HOW TO PURCHASE:

Log in to your CAPCA Dashboard, click "Online Learning," then navigate to the "Shop" tab.

Earn your CE credits online and stay current!

ADVICE for the ADVISER Podcast



A Grateful Farewell:
California PCAs Take the Spotlight

In our final episode, "Steward Stories: California PCAs in Their Own Words," we invite you to step inside the vibrant world of California agriculture one last time. Hear directly from the experts who walk the fields and champion sustainable practices—California's PCAs—sharing candid stories of stewardship, innovation, and the everyday triumphs that shape our landscapes.

This is not just a conclusion, but a celebration of the voices and dedication that have defined Advice for the Adviser. As we bid farewell, we honor the Board of Directors' decision to sunset the series, allowing our team to pursue new avenues for supporting our membership and California's agricultural community. Join us for this uplifting sendoff and listen to the honest reflections, heartfelt lessons, and inspiring connections that have made this journey unforgettable.

Thank you for being part of this story. The conversation doesn't end here—it evolves. This episode will air in late 2025. Subscribe now and experience the last episode that commemorates the expertise, passion, and heart of California's PCAs. Here's to new beginnings and continued stewardship! ■

Subscribe Now and Listen to the Latest Episodes!

Photo: ©Fred Rehman, Elysian Fields

SHAPING OUR FUTURE:

CAPCA's Demographic Survey Empowers Member Voices

CAPCA launched its demographic survey on November 4th and it will run through December 19th. This survey gives members a unique opportunity to help chart the course of the association's future. Conducted every five years, the survey provides critical insights into our evolving membership, allowing CAPCA to better represent PCAs to the Department of Pesticide Regulation (DPR), advocate for meaningful legislative change, and prioritize programs that serve you.

The importance of this survey goes far beyond simple numbers. Past demographic data has driven initiatives such as Pathway to PCA—ensuring a pipeline of well-trained professionals ready to step up as experienced advisers retire. It has also informed how CAPCA communicates with members and tailors support for day-to-day needs. In a rapidly changing industry, understanding the makeup and concerns of our community is essential to keeping our advocacy relevant and effective.

This year's survey arrives at a pivotal moment. Our sector faces new regulatory requirements, shifting pest pressures, and increased scrutiny from both the public and policymakers. CAPCA has responded with innovative solutions, such as advanced tracking technology for continuing education hours and strategic partnerships, including a recent collaboration with UnitedAg to expand member benefits. Your input helps CAPCA anticipate challenges and deliver resources that keep every PCA prepared and protected.

Member engagement is the lifeblood of CAPCA. By participating in the survey, you ensure your perspective is included in decisions that affect licensing, education, and compliance. The results will guide the board's strategy, inspire new programs, and strengthen our collective voice in Sacramento. If you're looking to get more involved, CAPCA offers many pathways—from joining committees to volunteering in your local chapter. Reach out to your chapter leadership and discover how you can contribute to our shared success.

CAPCA's values and advocacy efforts are shaped by active member participation. Through honest feedback and engagement, we continue to build an association that truly represents and supports the PCA community in California. ■

To access the survey, scan the QR code.

Photo: ©Fred Rehrman, Elysian Fields

PCA Sara Savary

A Commitment to Crop Care, Community, and Looking to the Future

Sara Savary's name is synonymous with crop consulting in California's Central Valley, and for good reason. With four decades of hands-on experience, a knack for solving agricultural mysteries, and a violin case never far from reach, Sara's journey as a Pest Control Adviser is both inspiring and delightfully unconventional. Through her dedication to her growers, her adaptability in the face of change, and her genuine warmth, Sara has built a reputation for expert advice, problem-solving, and genuine care for growers and their communities.

Career Path

Sara's agricultural roots run deep, sprouting from an academic foundation that began with a Bachelor of Science in Zoology, followed by a Master of Science in International Agricultural Development—credentials that equipped her with a broad, global perspective. She earned her PCA license in 1986. Determined to find a career that combined her academic background with her love for the outdoors, becoming a PCA was a natural fit, aligning her passion for science with her desire to work in the field. She quickly became a trusted adviser for the major crops blanketing Fresno, Madera, and Tulare counties. Stone fruit, grapes, almonds, walnuts, citrus, tomatoes, melons, cotton, and alfalfa: you name it, Sara's helped it grow.

Today, Sara works for Crop Care Associates, Inc, headquartered in Napa, California. She's spent her entire PCA career serving growers through Crop Care. Her job is multifaceted: she scouts client fields, diagnoses crop issues, recommends solutions, as well as helps ensure HR compliance. No day is ever quite the same, and Sara thrives on the variety and challenge this work brings.

Before her long tenure as a PCA, Sara spent two years as a fisheries extension specialist in the Peace Corps in West Africa. That experience broadened her perspective, teaching her patience, tolerance, and the ability to work in diverse environments. The skills she developed in extension work—teaching, listening, and adapting—have shaped her entire career.

Tech Transformations and Breaking Barriers

"If I ever got in a car accident, I'd be killed by all the books coming over and hitting me in the head," Sara quips, recalling her early days when chemical label books, IPM binders, and map folders threatened to turn her truck into a paper graveyard. Today, her entire arsenal fits neatly on an iPad. The shift from analog to digital hasn't just decluttered her cab—it's revolutionized her consulting. Field notes, chemical labels, pest identifications, and even farm maps are now a tap away, speeding up diagnostics and recommendations. Apps let her snap a photo of a mystery insect or plant and get an instant ID—a far cry from ferrying vials of bugs across town like a CSI investigator on crop patrol.

The PCA landscape has shifted, too. When Sara began her career, male faces dominated client meetings and skepticism toward women was the norm. "The older guys would look at you like, 'Yeah, this lady?'" she recalls. But times have changed and she's played a part in that change, helping increase the presence and respect of women in crop consulting. Younger growers—many of whom graduated alongside women—welcome her expertise. While there still aren't as many women PCAs in the field as she'd like, those who are present are respected. Sara is proud of this progress. "At least we made the guys aware that there were women," she laughs, remembering her first CAPCA meeting and the sea of men around her. Today, such scenes are rare—a testament to progress she helped foster.

Her Role: Problem-Solving as an Art and Science

Sara's favorite part of the job? Detective work. Her investigative skills have led her through countless crop conundrums, from yellowing patches in fields to mysterious vine declines. "It's like being a forensic scientist out there," she explains. Her work requires tenacity and creative thinking. Sampling soil, inspecting insects, analyzing lab results—sometimes all the clues lead nowhere, and it's just a bad tree. Other times, careful sleuthing uncovers chemical drift or a rootstock-

disease mismatch. She's the first to admit that not every puzzle has a tidy solution, but the thrill is in the hunt.

When outsiders ask about her work, Sara describes herself as a "plant doctor." She examines symptoms, investigates underlying causes, and prescribes treatments—much like a physician does for people, but her patients are crops and orchards. Sara likes this analogy to help bridge the gap between agricultural science and everyday understanding, making her role accessible to those unfamiliar with farming.

Lessons from the Field (and Grandpa)

Through experience, Sara's learned that the latest trends aren't always the best. Listening to growers—especially when they wax nostalgic about their grandfather's methods—can be surprisingly educational. "Sometimes the old guys knew what they were talking about," she admits. College lays the foundation, but real wisdom comes from the field—and from keeping an open mind. "Try not to dismiss anything out of hand and listen a lot more," Sara advises, her humility matched only by her curiosity.

Regulations, Water, and the Climate Curveball

The regulatory landscape is a minefield for PCAs these days. Sara avoids recommending class one danger chemicals whenever possible, prioritizing worker safety and sustainability. The pressure from processors and retailers—each with their own sustainability program—adds layers of complexity. Climate change is also of great concern. "Every year, blooms start earlier, summers get hotter, and insect generations multiply. I don't understand how you can be in this industry and not

see what's going on." Water scarcity, once a distant concern, now shapes her client list. "Make sure the grower has a good supply of water," she says, having watched water districts dry up over the years.

Client Connections: From Face-to-Face to Text-to-Text

Sara's approach to client relationships has evolved with technology. "I'm an introvert," she confesses, but fieldwork and years of experience have nudged her out of her shell. Now, many clients prefer texting and emails over weekly office visits—a relief for someone who cherishes solitude. Yet, whether in-person or digital, her goal remains the same: empower growers with knowledge and confidence. Her collaborative style, willingness to seek outside expertise, and ability to communicate complex ideas have earned her a loyal following.

Teamwork, Mentorship, and Staying Motivated

What keeps Sara passionate after forty years? A great team at Crop Care Associates, a supportive boss, and the freedom to set her own schedule. "He basically doesn't bother us. As long as the clients are happy, he's happy." The independence suits her, but it's the pursuit of learning—new pests, new crops, new techniques—that keeps her engaged. Even as she edges toward semi-retirement, her clients beg her not to leave. "I haven't had a summer vacation in 40 years!" she jokes. Her solution? "Maybe three days a week and a few weeks off for travel and music camps." Her growers plead for her to stay, and the outpouring of appreciation is a testament to her knowledge, commitment, and the relationships she's built.

Advice for New PCAs and Peace Corps Wisdom

For newcomers, Sara's advice is clear: "Don't rely too heavily on your education. You'll learn a lot more while you're doing the job than you ever did in college." The real world rarely fits the neat thresholds and recommendations of IPM manuals. Timing, field conditions, worker schedules, and uncooperative weather demand flexibility and judgment that only experience can teach. Her stories—from cotton fields to cantaloupe harvests—underscore the importance of seeing the bigger picture, not just the data.

Her Peace Corps experience instilled patience, tolerance, and a broad perspective. She credits those

years with shaping her communication skills and her approach to listening—an important skill she carries into every grower meeting. The experience also instilled a deep appreciation for the resources and opportunities available in the United States. "I learned not to take things for granted in this country. We have so much."

A Legacy of Service: CAPCA and Advocacy

Sara's involvement with California Women for Agriculture and CAPCA reflects her commitment to advocacy. She's participated in networking events, served on legislative committees, led task forces, served on the CAPCA state board, and educated the public. Though she notes that her involvement has faded in recent years, she says she still values CAPCA for its role in keeping advisers connected and informed about regulatory and industry changes. Looking ahead, Sara hopes CAPCA will do even more to communicate about what PCAs do and reach out to the broader community. She believes better public understanding and outreach are key to closing the perception gap and fostering future generations of crop consultants

Work-Life Balance: Violin, Family, and a Harness-Trained Cat

When the growing season pauses, Sara pivots to music, playing violin in community orchestras and dreaming of summer music camps. She and her twin sister—a teacher with summers off—look forward to their next adventure, perhaps the Twin Festival in Minnesota they've long plotted to attend. Off-season means freedom to travel, practice, and explore. And let's not forget the newest addition to her household: a harness-trained adventure cat, ready to kayak and hike wherever Sara leads. "The neighborhood is like, you're walking your cat on a leash? Yes, I am!" she laughs. "I'm not going to let him out unsupervised. I learned that the hard way!"

The Public Perception Gap and Hopes for the Future

Despite her achievements and positive impact, Sara believes there's still a disconnect between the public and the world of agriculture. Too often, she observes, people assume food magically appears on shelves, unaware of the hard work, science, and care that go into each harvest. "There's a lot of misunderstanding about what PCAs do, and about growers in general," she says. Headlines may focus on pesticides or water use, but few appreciate the daily decisions made in the name of safety and sustainability. Sara hopes for more open conversations between agriculture and the public. She's optimistic that education efforts will foster the next generation's appreciation of farming's complexity and importance.

As Sara reflects on her career, she's candid about the hurdles ahead. Regulations are tightening, and climate variability keeps every season unpredictable. She worries about the shrinking number of young people entering the PCA profession—particularly women, who still face unique barriers. Mentorship, she insists, is critical. "We need to show them that this is a field where you can make a difference, where science and people skills matter." Sara advocates for more hands-on learning, internships, and opportunities for new advisers to shadow experienced PCAs.

For her own future, Sara envisions a gradual step back, but not a full retirement. She hopes to continue contributing, whether through part-time consulting, volunteering with advocacy groups, or simply sharing her wisdom with newcomers. More travel and more music are on the horizon, as well as new adventures with her family and her cat. "I don't see myself ever really stopping. There's always something new to learn, some new crop or challenge. That's what keeps me going."

A Legacy of Curiosity and Care

Sara Savary's story is more than the tale of a successful PCA. It's a testament to the power of curiosity, resilience, and connection. From her early days in the orchards and fields of Central California to her leadership in advocacy and mentorship, Sara has left a mark on her profession and her community. Her advice—to listen, to learn, to adapt—serves as a guiding light for those who follow in her footsteps. In a world of constant change, Sara remains rooted in service, curiosity, and a deep love for the land and its people. And, of course, her violin and her cat companion are never far behind.

As growers, colleagues, and friends urge her to stick around "just a little longer," Sara's legacy is already assured. She's shown that crop care is not just about science or business, but about people, relationships, and the joy that comes from making things grow. For Sara Savary, each season brings new challenges and new adventures, on the farm and beyond. ■

From The Archives

This 2005 profile of Sara L. Savary highlights the enduring challenges and priorities of agricultural consultants. Many issues she discussed—such as overregulation, the disconnect between policymakers and farmers, and the growing impact of federal trade on IPM—remain highly relevant.

FROM THE ARCHIVES

PCA PROFILE

A COLLABORATIVE PROCESS

Focus On: Sara L. Savary

CAPCA Chapter: Fresno-Madera
Type of Consulting: Pest, irrigation, fertility management on grapes (wine, raisin, table), stone fruit, almonds, walnuts, tomatoes, cotton, beans, melons, and whatever my clients want to grow (if they can grow it, I can watch it).
Year PCA License: 1989
Family: Mother, Liz Fackler, lives in Exeter, CA; Father and step mother Jack and Jean Schmitz live in Arcadia, CA; brother Scott Schmitz is a computer programmer in Burbank, CA, Twin sister Sandy Hay is an elementary school teacher in Livingston and lives in Merced with her husband Art and my seven-year-old niece Cassie. Husband of 20 years, Albert, whom I met while in the Peace Corps, is from Togo, West Africa.
Education/Background/Special Training: BS in Zoology from Cal Poly Pomona (1982), MS in Agriculture from Cal Poly SLO (1986), two years of Agriculture Extension work specializing in Fish Farming in the Peace Corps in Togo, West Africa (1982-1984)
Employment: Crop Care Associates, Inc., Central Valley Region (I work in Fresno, Madera, Merced, San Joaquin, Sacramento, Yolo and Solano counties);
Position: Vice President;
Years with current employer: 17

Served three years as President of the Central Valley chapter of California Women for Agriculture; served two years as Central District Director on the State Board for California Women for Agriculture; is the current Emergency Action/Web-master for California Women for Agriculture. Has been on the Fresno-Madera CAPCA board for 4 years and is the current President. Currently serves on the CAPCA Government Relations committee. Serves as the current Central California Advocacy Coordinator for the National Peace Corps Association.

Most Challenging Pest Management Experience: My very first pest management problem was my most challenging. One of my farmers in Togo was farming vegetables for the European community in the capital. Worm pests were a big problem and he wanted me to go to the capital to get him some DDT. Being fresh out of college with a zoology degree I was, of course, appalled at his request for DDT. I thought the cost of the chemical and the transportation could be better put to use with some kind of local alternative. We came up with the plan of using the biggest resource available, labor, and paid school children one "penny" for each worm they picked off the vegetables. It did turn out to be cheaper and the money stayed in the local economy.

Greatest Concern for the Industry: Legislators who know nothing about agriculture and environmentalists who have no idea what it takes to make a living off of the land. Overregulation is everyone's greatest concern and how it is negatively affecting the industry.

July / August 2005

Sara's focus on collaboration, staying current with technology, and economic sustainability for growers continues to be central in modern agriculture. She also stressed the need for educating adults, not just children, about agricultural issues—a point still vital as public perception influences policy.

Don't miss Sara's updated profile in this issue of the Adviser for more on her experiences and contributions to the field. Her dedication and perspectives make for an inspiring read! ■

Is there an issue you feel CAPCA should take more leadership on? Currently CAPCA only focuses on State issues but with the continued interference of federal trade policies on IPM implementation (e.g., demands from trading partners on when, what and how to handle pests in the field), I feel that CAPCA should be involved in making sure we are allowed to do our IPM work without over-regulation from trade policies. In addition, more work needs to be done to educate the voting population about agriculture. It is nice to teach the kids but if the adults vote agriculture out of existence then the kids will never experience the agriculture they are being exposed to in the classroom.

What are you doing to improve your professionalism? Trying to keep abreast of new technologies/techniques is always a challenge. There are new things happening, new services, devices, etc., that are being promoted to help growers and PCAs. The biggest challenge is learning about these things and evaluating them to see if they have a good technical and economic fit. Sometimes the cost outweighs the benefits. Sometimes it is O.K. to just see that the old ways are the best ways. I have learned a lot from listening to farmers and PCAs who have been doing this for a long time. I want to spend more time looking into new techniques such as reduced tillage, and new technologies such as GPS-based imaging to see how they can be of use in the overall crop management picture.

What motivated you to become a PCA? I enjoyed teaching farmers when I was in the Peace Corps. It was very fulfilling bringing new technologies to people who really appreciated it. Being a PCA is very much like what I did in the Peace Corps as I am helping my clients solve problems with new technologies or by using existing tools in different ways.

What motivates you to make the decisions you make in the field for your clients? Economics. I want my clients to keep farming. They can't do that if they don't make a profit. There is a lot that goes into that and pest management costs are only a small part. But farming can't be sustainable unless the farmer can make money at it. Environmental, worker protection, regulation, trade, all of those factors can't be taken into account above economics. I want to make sure that my decisions are timely and cost effective. The most cost effective decision I can make is one NOT to spend money and keep a profitable crop in the field. If money has to be spent, it has to be spent so that profitability is maintained. That is my goal, but there are times when that gets to be very difficult. The most cost effective treatment is not always the best if there are worker re-entry or pre-harvest intervals to factor in. Environmental concerns in sensitive areas are also something to consider and may make the right choice not always the cheapest, but most of the time one can find a solution that still maintains economic viability (at least for now). Sometimes one has to look at what is going on away from the field when it comes to making decisions for clients. Being involved in legislative and regulatory issues is, I feel, also an important part of a total IPM approach. Anything that affects the farming system effects the ability to make decisions in the field.

Are you educating clients/growers? I like to think of my client relationships as a collaboration. I want to learn as much from my clients as they learn from me. We all see different things and see the same things in different ways. Information flowing in both directions makes for more informed decisions.

Are you or your clients/growers using genetically altered crops or other "cutting edge" technologies? I have clients who are using GMO crops, reduced tillage methods, Infrared and NDVI imaging and starting to look into using GPS/Satellite Imaging. Trying to find out how all these new technologies will fit into making pest and crop management decisions is an interesting challenge.

Describe your idea of IPM: The use of different techniques/technologies in combination to control pests, with an emphasis on methods that are least injurious to the environment, where possible, and most specific to the particular pest. A sustainable pest management approach is one which combines the use of biological, cultural, physical, and chemical tactics in a way that minimizes economic, health and environmental risks. A successful IPM practitioner not only has knowledge of pests and their biology but has knowledge and can make decisions about irrigation, fertility, and cropping patterns that can all have an effect on pest management decisions. IPM should not just be about "pest management" but should focus on management of the entire crop growing system. ❧

CAPCA Adviser

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Iodine In Agriculture

Are we missing a key nutrient?

Content provided by SQM North America

"Iodine should be considered a nutrient for plants."

This is the key takeaway from a scientific article published in February 2021 by a team of Italian scientists[1]. While iodine has long been recognized as essential for human and animal health, it has now been discovered that plants also require this element in trace amounts in their nutrient solutions.

Iodine is present everywhere, but in small amounts. It's most concentrated in the oceans, where there's about 0.5 micromoles of iodine per liter of seawater. On the flip side, rain, soil, and irrigation water have much lower concentrations: less than 0.2 micromoles per liter.

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Iodine

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Moreover, only a small fraction - less than 10%- of the iodine in the soil is available for plants to take up. In humans and farm animals, a lack of iodine can lead to disorders like goiter and hypothyroidism, which disrupt thyroid function. As iodine from soil filtrate flows into streams and rivers, it eventually makes its way back to the ocean.

For the first time, the natural occurrence of iodinated proteins in higher plants has been documented, with 82 such proteins identified.

Research involving phenotypic, genomic, and proteomic studies has shown that iodine is crucial for leaf and root development, efficient photosynthesis, timely flowering, enhanced seed production, and activating a defense system against both abiotic and biotic stress.

In regions where soil and water are naturally low in iodine, crops can suffer from reduced yields and lower fruit quality. Adequate iodine supply directly benefits growers by boosting crop yields and minimizing losses.

Iodine is crucial for leaf and root develop, efficient photosynthesis and timely flowering

The need for iodine aligns well with potassium nitrate applications, which provide essential nitrate and potassium in nutrient solutions.

Nitrate nitrogen absorption promotes the uptake of important soil cations like potassium, calcium, and magnesium. Iodine naturally complements nitrate in calcium transport within plants; **without sufficient iodine, this process can be impaired.**

Iodine helps nitrate move calcium in plants; without enough iodine, this process can slow down.

Iodinated proteins in the roots play a role in energy metabolism and stress response. Without adequate iodine, calcium transport to the fruits can be reduced. Tests have shown that when iodine is supplied properly alongside potassium nitrate, it results in an optimal redox balance and energy metabolism, enhancing calcium transport from roots to fruits[1].

This leads to higher calcium concentrations in the fruits, reducing the likelihood of quality issues such as blossom-end rot and extending shelf life during transport.

Therefore, maintaining an adequate level of iodine in nutrient solutions helps producers achieve optimal crop yields and high-quality products, even under challenging climatic conditions.

Source:
[1]**Evidences for a nutritional role of iodine in plants.** Kiferle, C.,.Martinelli, M., Salzano, A.M., Gonzali, S., Beltrami, S., Salvadori, P.A., Hora, K.,.Holwerda, H.T., Scaloni, A., Perata, P. (2021) - **Frontiers.**

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Another Advocacy Year in Review

Each legislative session presents its own set of challenges and unpredictability—truly a unique roller coaster ride. We begin the process with a large number of bills, but as the session progresses, our attention narrows to a select few that have the most potential to affect you, your growers, or key commodities. Throughout the year, we employ a wide range of tools, attend meetings, and seize opportunities to engage, all with the goal of representing you, the PCA, as effectively as possible.

Much of the essential work happens informally—conversations held away from official comment periods, sometimes even over a drink offsite. While I won't detail those informal solutions here, it is important to understand that maintaining the stability of the PCA license relies on a complex web of interactions happening every month, week, and day.

In the past decade, the CAPCA Board has placed an increasing emphasis on Advocacy, responding to the ongoing pressures of each legislative session. This year, we have both sustained and expanded our efforts. The current rat infestation has led us to deepen our collaboration with the CDFA team. This includes attending ongoing VPCRAC meetings, ensuring industry members are both recommended for and appointed to open VPCRAC seats, and initiating weekly meetings with key CDFA staff to exchange information and resources, all while persistently advocating for solutions to the rat problem. Because of this active engagement, CAPCA was entrusted with publishing the new emergency label uses to inform PCAs and to provide additional resources clarifying the proper use of rodenticides. If you missed these updates in the September issue, you can access them online at: capca.com/rats-in-the-valley

Addressing the rat infestation has required a tremendous number of conversations and a sustained focus on providing practical resources and support. CAPCA remains committed to this issue because we believe it demands a long-term solution for our members. PCAs do not only encounter newly invasive pests; they also need improved tools and resources to handle significant outbreaks of known pests, especially when traditional IPM and maintenance methods are not sufficient.

During this legislative season, we met with more than 40 legislators through a variety of meetings, meals, and events to emphasize the professionalism and specialized needs of PCAs. Our outreach included Alliance Community Fund events, Field Tours, and active engagement on bills through our Lobbyist at KSC.

The Advocacy Committee monitored a wide range of legislation throughout the session but ultimately concentrated our efforts on four key bills. For these, we provided talking points, submitted comments, and signed coalition letters. Notably, AB 732, authored by Assemblymember Alexandra Macedo, was signed into law thanks to the tireless work of a broad coalition of agricultural stakeholders, including CAPCA. We recognized that overcoming opposition and educating the administration were essential steps in finding effective solutions for abandoned and neglected acres statewide. The ongoing rat infestation vividly illustrates how neglected or abandoned land can pose significant risks to neighboring crops and communities.

As is typical, regulatory engagement consumed a significant portion of our time, particularly as we worked on two fronts related to SPM—with both CDFA and DPR. We held nearly weekly meetings with CDFA staff to discuss various topics, including the rat infestation in the valley. Additionally, we participated in comment periods regarding Regulatory Alignment and presented your feedback to the CDFA Board, especially concerns raised about the Spray Days rollout.

With DPR, we aimed for quarterly meetings with executive staff, as well as engagement at monthly Ag Stakeholder meetings and through standing quarterly APCAC meetings. We participated in workshops and/or comment periods for the EJAC Committee, Pesticides Near Schools, the JLAC Audit, rodenticide issues, and the support of new Director Karen Morrison in her confirmation hearing.

This year also brought changes, as DPR announced its own hours tracking database and the impact this database had on license renewals. We advocated strongly for SPM Continuing Education (CE) opportunities for PCAs under DPR oversight, resulting in nearly three hours of SPM-focused CE being approved for the CAPCA Annual Conference. Following this, DPR recently updated their sponsor outreach materials to better highlight key information related to SPM approvals.

Looking ahead to 2026, the Advocacy Committee is already planning new initiatives to highlight Jay Rosenheim's study *Conflicts of interest, risk aversion, and pesticide use in California agriculture*, and to showcase the vital role that PCAs play in integrated pest management. For a summary of Dr. Rosenheim's work on what motivates PCAs' actions in the field, please refer to page 42.

We also recognize your desire for privacy regarding certain aspects of your licensing information. We are gathering data on this issue through our demographic survey, so please make your voice heard by completing the survey by December 19th. See page 25 for the QR code link or check your email inbox for recent reminders. ■

Facing DPR CE Roadblocks?

Your Voice Can Drive Real Change!

Are you finding the Department of Pesticide Regulation's (DPR) continuing education (CE) process more challenging than it should be? If confusion, frustration, or a feeling of being overlooked sound familiar, know that you're not alone. From licensees to CE course sponsors across California, many are dealing with hurdles that complicate participation and compliance—whether it's gaps in tracking completed hours, unclear communication, or slow response times from DPR.

Key Issues We're Hearing About:

- Missing Hours: Many licensees are discovering that their completed CE hours aren't reflected in DPR's records, raising concerns about attendance tracking and crediting.
- Slow Response: Long wait times for answers from DPR make it difficult to resolve CE-related matters efficiently.
- Mixed Messages: Sponsors often receive inconsistent guidance on course approvals and reporting standards, adding confusion to the process.
- Eligibility Uncertainty: Determining which topics qualify for DPR CE credit is not always clear, especially as DPR's own examples highlight content beyond just pesticide-related topics—including IPM/SPM practices. Sponsors want clarity on how these broader subjects fit approval criteria.
- Attendance Verification Issues: When DPR doesn't prioritize the license number for verifying attendance, sponsors are left struggling.
- Lack of Guidance: Many stakeholders aren't sure how to reach DPR for help or how to start a productive conversation.

If you've faced any of these challenges—or others that have yet to be recognized—your input is critical. CAPCA wants to gather your stories, feedback, and suggestions to push for practical improvements that benefit everyone in the pest management industry.

Here's How You Can Make an Impact:

- Take the Survey: Share your experiences and challenges with CE tracking, course approvals, eligibility, or any communication issues with DPR. Every response brings us closer to meaningful reform.
- Rally Your Peers: Encourage colleagues to participate—the more voices we have, the stronger our case for change.
- Stay Connected: Watch for CAPCA updates so you're always informed about progress and changes in the CE landscape.

Act Now—Shape the Future

Don't let your concerns go unheard. By participating in our confidential survey, you'll help CAPCA represent the collective needs of the industry and advocate for a system that's transparent, efficient, and fair to all. Your feedback isn't just important—it's essential to driving positive change.

Ready to be part of the solution? Take the survey today. Your feedback is the first step in building a smoother, more transparent CE system for everyone. ■

Fill Out the Survey!

Targeted Vegetation Management in Agricultural Ditches Can Lower Pest Outbreak Risks While Supporting Beneficial Arthropods

By Maripaula Valdes-Berriz, Abigail Brondos, and Oleg Daugovish

Agricultural drainage ditches often have running water or enough moisture to maintain vegetation year-round. It is well documented that flora at margins, drainage ditches, and other non-crop areas can maintain diversity of arthropod assemblages and the species that reside in these ditches can be common insect pests as well as beneficial arthropods (Baba and Tanaka 2016, Herzon and Helenius 2008, Kutz 2020). However, the reports of vegetation and associated arthropod dynamics in Southern California agriculture are lacking.

The presence and diversity of arthropods is affected by geographic location, climatic conditions, and seasonal changes at a large-scale and a myriad of factors at a local scale such as plant species, vegetation management, surrounding human activities, just to give some examples. Drainage ditches often harbor naturalized weedy, non-native, and wild plants that serve as food sources and shelter to arthropods. Thus, they become reservoirs of pest and beneficial insects from which they can move to agricultural fields.

In Ventura County, three insect pest species of particular economic importance cause millions of dollars in damages to key agricultural commodities. These are diamondback moth (*Plutella xylostella*), lygus bug (*Lygus herperus*), and the western flower thrips (*Frankliniella occidentalis*), which transmits the Impatiens Necrotic Spot Virus (INSV), an increasing problem. All three pests are known to use invasive, naturalized, and possibly native plant species that

FIG. 1. Two drainage ditches sampled in Ventura County during this study showing different vegetation management approaches.

can be found in ditches. Field margins, ditches, and other uncultivated areas can be both sources (Kahuthia-Gathu 2007) and traps (Ramert et al. 2010) for these pests. Lygus bug abundance has been positively correlated with the presence of uncultivated habitats by Sivakoff et al. (2013), and diamondback moth has also been found to be more abundant near weed-filled drainage ditches (Hu et al. 1996). On the other hand, larger numbers of generalist predators in field margins have been correlated to reduced density of diamondback moth in the tropics (Grönberg 2008). Flowering plants in field margins have also been shown to host considerable numbers of common predators of the western flower thrips (Atakan, 2010).

Between November 2023 and September 2024, we conducted research on the arthropod diversity in agricultural ditches in Ventura County. The aim of this project was to identify and quantify the role of year-round ditch vegetation as reservoirs for insect pests and beneficial arthropods in Ventura and the region as a whole. We hope this information will lead to better management decisions in these areas of natural-agriculture interface.

Vegetation surveys and arthropod sampling

Vegetation surveys and arthropod sampling were conducted every four months at eight drainage ditches in the Oxnard plain, Ventura County. We recorded information on the percent cover of each plant species and other vegetation features using 1m^2 quadrats. Using this information, we took five samples from three plant species with the highest coverage at each site with a bug vacuum. The samples were then sorted to identify the three key pests and a range of general predatory arthropods.

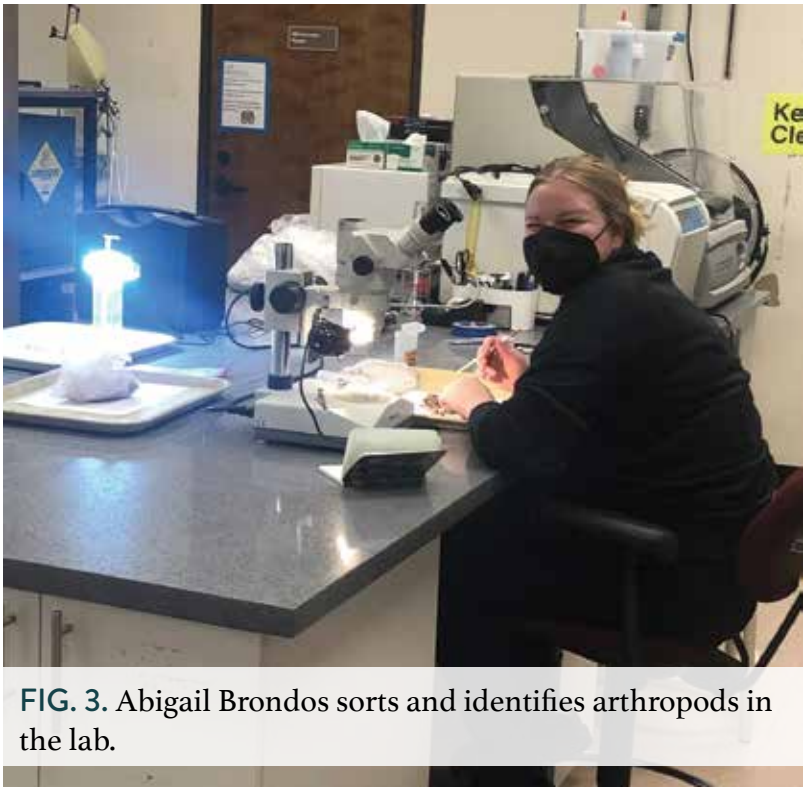


FIG. 3. Abigail Brondos sorts and identifies arthropods in the lab.

FIG. 2. Maripaula Valdes-Berriz and Oleg Daugovish sample ditches using a bug vacuum.

Pest species preferences and trends

Diamondback moth *(Plutella xylostella)* overall abundance, which included adults and larvae, was significantly higher in June than other sampling dates. It increased from an average per sample of 0 and 0.1 individuals in November, March, and September, to 7.7 individuals in June. As expected, diamondback moth also had a significant preference for weeds of the family Brassicaceae. Both black mustard (*Brassica nigra*) and cress (*Nasturtium officinale*), had higher counts of this pest, but surprisingly, it was more than double in cress than in mustard with an average of 13 and 6, respectively. Its abundance also decreased as overall plant cover increased, but it was not correlated to the percentage of bare ground.

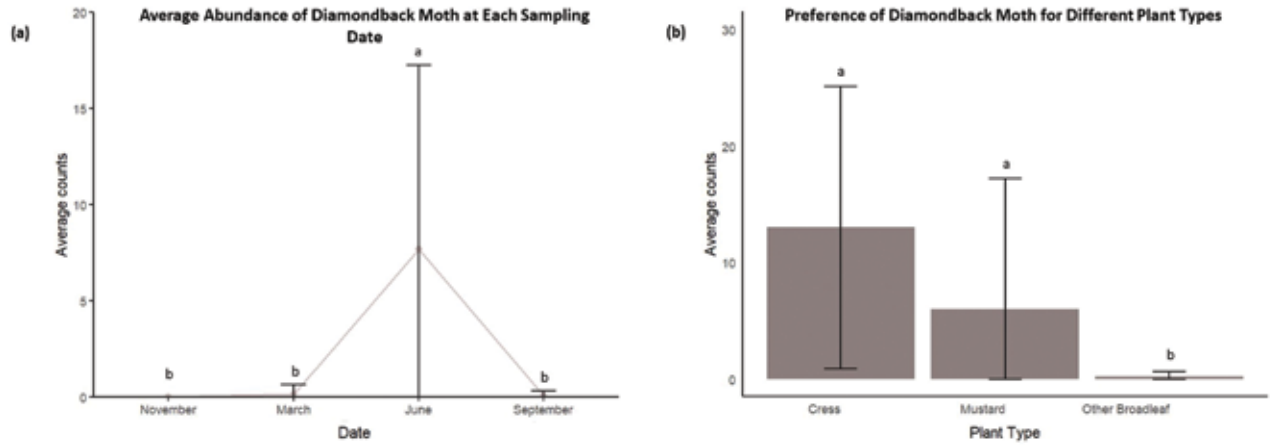


FIG. 4. (a) Average abundance of diamondback moth at each sampling date, (b) average counts of adults and larvae for different plant types showing a preference for brassica species over other broadleaf species.

Lygus bug *(Lygus herperus)* showed a similar, although less pronounced trend. It had a significantly higher count in June at 11.5 per sample, followed by March and September at 1.3-2.9 individuals, and they were all significantly higher than in November with only 0.5 individuals per sample. Although lygus also showed a preference for *Brassicaceae* plants when they were available, it had a significantly higher count in cress than mustards. Lygus also used other broadleaf plants, and grasses to a lesser extent, when brassicas dried up or were removed as part of ditch vegetation management. This flexibility allowed them to maintain a presence throughout the year, but at low abundances through the winter, early spring, and fall. There was no relationship between lygus and percent vegetation cover or bare ground.

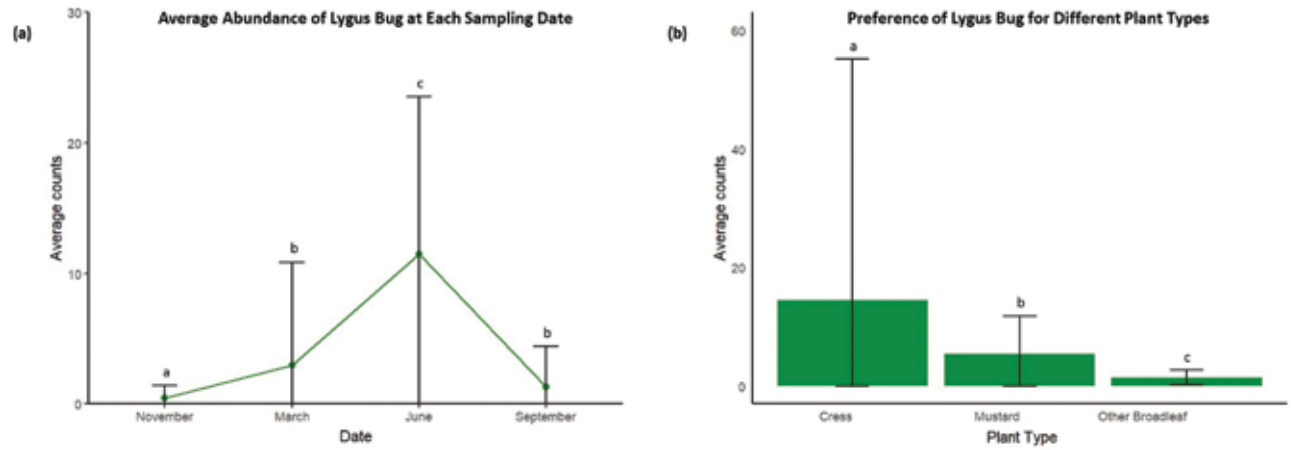
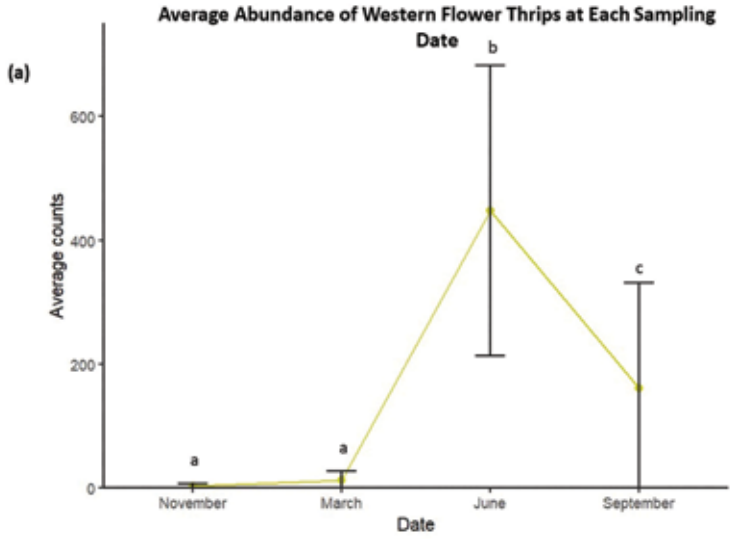


FIG. 5. (a) Average abundance of lygus bug at each sampling date, and (b) average counts for different plant types showing preference of lygus for brassica species over other broadleaf species.

Western flower thrips *(Frankliniella occidentalis)* also had the highest counts in June with 448 individuals per sample, followed by September with 161 thrips. These dates were both significantly different and higher than November and March, which had 3 and 12 thrips, respectively. Thrips used a variety of plant families throughout the year and appeared to be more driven by resource availability than preference. Western flower thrip abundance was not related to plant cover or percent bare ground.

Given that western flower thrip is a known vector for INSV, we tested 10 plant species where the pest was found in June. Nine species tested negative, and one, mallow *(Malva parviflora)*, resulted in inconclusive results.



(b)

Species	Results
Mustard	Negative
Cress	Negative
Spurge	Negative
Sow thistle	Negative
Prickly lettuce	Negative
Primrose	Negative
Mallow	Inconclusive
Hemlock	Negative
Bermuda*	Negative
Nettle*	Negative

* Only one sample was tested.

FIG. 6. (a) Average abundance of western flower thrips at each sampling date, and (b) results of INSV testing on ten plant species found in drainage ditches and used by western flower thrips in June.

Arthropod predators such as big-eyed bugs, lacewings, lady beetles, pirate bugs, and spiders were present year-around. Their abundance followed similar trends as insect pests. June and September had the highest numbers at 31and 28 individuals per sample, at least double the counts in March with 14. The lowest counts were found in November with 8 individuals per sample, but this was not significantly different than the March counts. Given that we identified 8 different predator types from 5 families, there was at least one individual of any predator type or 1.6 individuals of any given arthropod family per sample. They also used a variety of plant families ranging from six to ten, most likely driven by the availability of these plant species and of their prey at different times of the year.

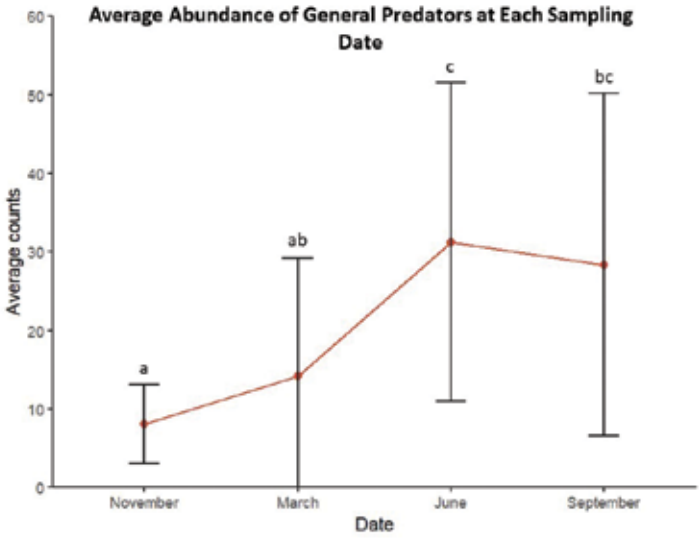


FIG. 7. Average abundance of predatory arthropods at each sampling date.

The number of general predators increased as vegetation percent cover increased, although there is only moderate support for this trend. However, increases in the percentage of bare ground resulted in reductions in the abundance of general predators, especially in March and September.

As part of this project, we have collected over four thousand parasitoid wasps, which we are still identifying. However, we already know they were found in many types of vegetation, even dry thatch, and at all sites throughout the year. This suggests that ditches are important for providing resources and maintaining populations of parasitoids, many of which could play a role in reducing insect pest populations.

Recommendations for vegetation management in drainage ditches:

- If lygus bug or diamondback moth are pests of concern to you, you should control plants in the family Brassicaceae such as mustard and cress before March as they start to grow in early spring.

- If western flower thrips are a concern for your crop, you will need more widespread control starting between April and June. You should focus on plants that are flowering, especially in the families *Poaceae, Apiaceae, Asteraceae, Brassicaceae,* and *Onagraceae.*

- When possible, perform more targeted control of *Brassicaceae* plants and allow some vegetation to grow throughout the year to maintain populations of predatory arthropods. You could keep plants in the families *Asteraceae, Malveaceae* and *Poaceae* in the winter, and *Euphorbiaceae* (spurge), *Amaranthaceae* (lambsquarters and pigweed), *Urticaceae* (nettles), and *Polygonaceae* (dock) through the summer. These had a lower abundance of western flower thrips during those times of the year.

- Although trees and native perennial shrubs are not well represented in this study, there is some evidence they could support more general predators and parasitoids and less pest insects when carefully selected (Dix et al. 1995, Schellhorn and Bianchi 2010).

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Featured Article

PCAs, Conflicts of Interest, and Pesticide Use in California Agriculture

By: Jay A. Rosenheim, Ph.D., Department of Entomology and Nematology, University of California, Davis; and Michael Culshaw-Maurer, Ph.D., Transit Information Department, St. Paul, MN

Dear Reader,

The study published here was originally commissioned as part of discussions in the SPM Workgroup, which recognized that PCAs are an important component of pest management decisions in California. The results reflect the work of professional license holders who are practicing IPM in the field every day across California, and highlight the importance of bringing both data and new insights to the conversation. Articles in upcoming CAPCA Adviser issues will detail adoption of IPM using a USDA National Agriculture Statistics Service data set and the results of a recent CDFA-funded project assessing SPM practices used by PCAs in several California cropping systems. Taken together, the current and upcoming articles will build a data set documenting that implementation of SPM is already well underway across the state. For those who participated in the study described in this article and the upcoming articles, we appreciate your professional engagement to document the impacts of your work through data.

Jim Farrar, *Director, UC IPM* and
Kevi Mace, *Supervisor, Office of Pesticide Consultation and Analysis, CA Dept. of Food and Agriculture*

Introduction

Nearly 50 years ago entomologist Robert van den Bosch's book *The Pesticide Conspiracy* was published. In it, van den Bosch argued that sales commissions earned by PCAs who are employees of agricultural chemical distributors ("sales PCAs") promote overuse of pesticides in California agriculture. Sales commissions were proposed to create a conflict of interest, in which the potential for financial gains by sales PCAs would take precedence over the best interests of their client farmers. This "conflict of interest hypothesis" has been repeated for so long that it has become conventional wisdom in many quarters and has shaped policy documents at state, national, and international levels.

But is there any evidence that the conflict of interest hypothesis is true? For many years, efforts to examine how PCAs influence pesticide use by their farmer clients have been hamstrung by the absence of large-scale data. Early studies relied on questionnaires directed to relatively small numbers of farmers. One influential early study conducted by agricultural economist D. C. Hall and published in 1977 compared pesticide use by farmers advised by sales PCAs with farmers advised by "independent PCAs," who charge their client farmers a flat per-acre fee for their scouting services but who do not receive sales commissions. Hall suggested that California cotton and citrus farmers advised by sales PCAs spent approximately twice as much on pesticides as farmers advised by independent PCAs. He noted, however, that this difference appeared to be decreasing over the 4-year period analyzed (1970-1973). Since that time, two additional questionnaire-based studies of pesticide use by California farmers published by S. Brodt and colleagues in 2005 and 2007 found no

difference between farmers advised by sales PCAs versus independent PCAs. Thus, altogether, published research has generated very little support for the conflict of interest hypothesis.

Building a dataset

More recently, changes in data collection practices by the State of California have created an opportunity to address the conflict of interest hypothesis with statewide data. Starting in 2011, County Agricultural Commissioner offices across the state started to use the *CalAgPermits* system to record information describing pest management practices for farmers applying for pesticide use permits. Included in this information were the identities and employers of the PCAs working at each farm. We used *CalAgPermits* data to identify, statewide, farmers being advised by four groups of PCAs: sales PCAs, independent PCAs, in-house PCAs (full-time staff hired by the farmer), and farmer PCAs (farmers who obtain licenses to act as their own PCAs). The *CalAgPermits* data, when combined with the statewide pesticide use data compiled in the Pesticide Use Reporting (PUR) system, allowed us to build a dataset for pesticide use across all outdoor California commercial agriculture, 2011-2020; the final dataset included over 1.4 million observations, where a single observation included total year-long pesticide use on a particular crop (e.g., almonds, cotton, or raisin grapes) grown in a given field by a given farmer in a given year. Our analysis controlled statistically for other factors that could influence pesticide use, including the county, the year, the size of the field, the size of the farming operation, and whether the field was being managed conventionally or organically. Pesticide use was measured in three different ways: (i) the total number of pesticides applied; (ii) the total weight of

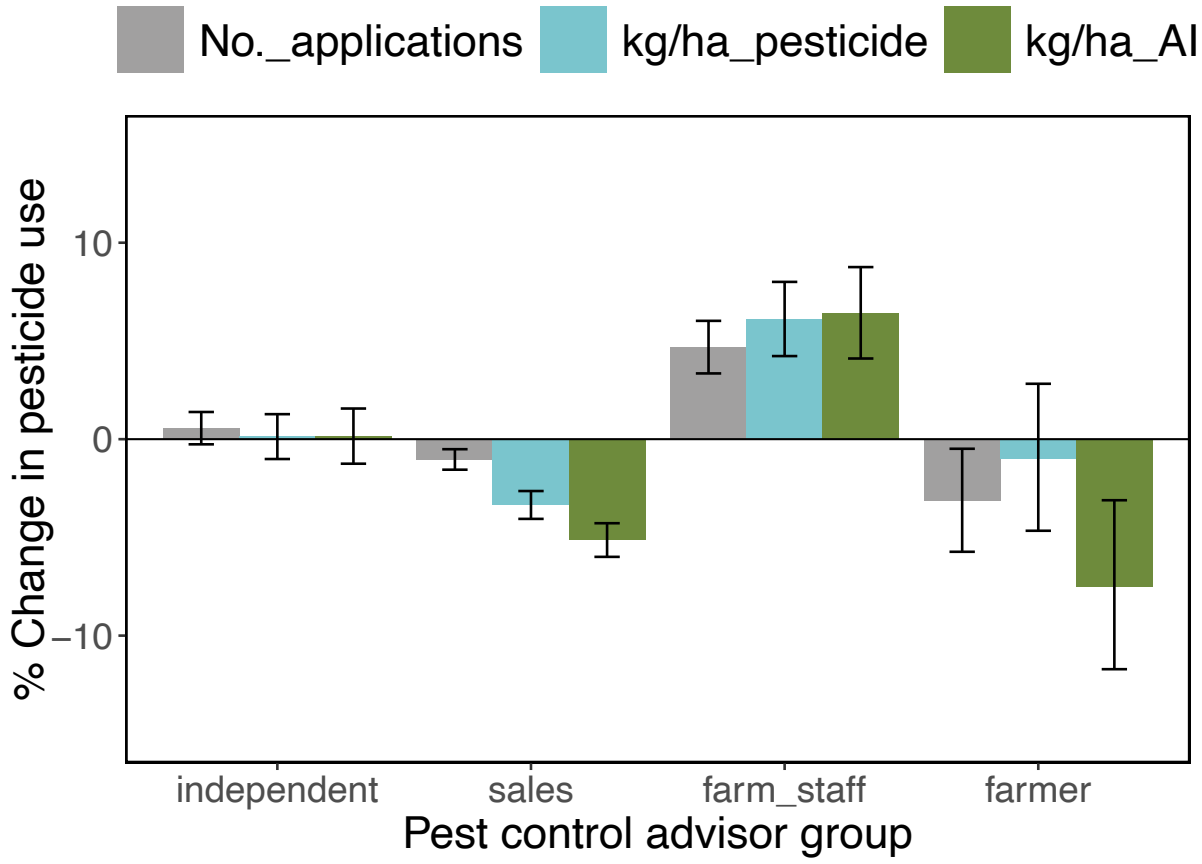

FIG. 1. Total pesticide use (including pesticides targeting insects and mites; plant pathogens; and weeds) by California farmers 2011-2020 who use different groups of PCAs. Shown is the percent change in pesticide use compared to the state-wide average. Shown are means and the associated 95% confidence intervals, which provide a measure of the precision of the estimated means.

formulated pesticides applied per unit area of the crop field (kilograms per hectare); and (iii) the total weight of the pesticide active ingredient applied per unit area of the crop field.

Analysis results

We found no support for the hypothesis that conflicts of interest lead to elevated use of pesticides by farmers advised by sales PCAs (**Figure 1**). In particular, farmers advised by sales PCAs used slightly less total pesticides than farmers advised by independent PCAs. Although the observed differences were quite small in magnitude (1-5%), these differences are the opposite of what is expected under the conflict of interest hypothesis. This is true regardless of which measure of pesticide use we use (application number, weight of formulated pesticide, weight of active ingredient). Instead, we found that farmers advised by in-house PCAs use slightly more pesticides overall; more detailed analyses showed that in-house PCAs use more pesticides to control groups of pests that are capable of damaging outbreaks (insects and mites; plant pathogens) but not to control non-outbreak pests (weeds).

General discussion

Our analysis suggests that farmers advised by sales PCAs are not using more pesticides than are farmers advised by independent PCAs. The idea that sales commissions create conflicts of interest that lead farmers to overuse pesticides appears to be an example of a "conventional wisdom" that has been enshrined largely in the absence of supporting evidence.

We emphasize that although the dataset we assembled gave us a powerful look at pesticide use practices of California farmers, these data cannot tell us which pesticide use program performs best in terms of producing a high quality, high yield crop and top returns for each dollar spent on pest management. The *CalAgPermits* and PUR databases are not linked to data on pest management costs or harvest quality or quantity. Thus, we make no judgements regarding whether one group of PCAs provides better pest management services for their client farmers than another. In particular, we do not know if the modestly elevated use of pesticides by in-house PCAs against potentially outbreaking pests results in improved control and better overall outcomes for their farmer employers.

Why don't sales commissions lead to elevated pesticide use?

Discussions with PCAs and agricultural chemical retailers revealed three factors that may weaken or break the expected linkage between sales commissions and pesticide use. The first concerns the details of the sales commission itself. Sales PCAs do receive a supplement to their base salary from sales commissions, but these commissions are based not on gross sales receipts, but rather on the profit generated by a sale. A near-universal observation shared with us is that profit margins associated with pesticide sales are quite narrow, weakening any financial incentive to sell more pesticides.

The second reason that sales commissions do not appear to translate to heavier use of pesticides concerns the nature of the relationship between PCAs and their client farmers. PCAs establish long-term relationships with their client farmers that are based on trust. PCAs are acutely aware of the costs incurred by their clients as they farm their crops, and PCAs must strive to achieve high quality outcomes with cost efficiency. PCAs who fail to achieve this will lose clients and incur the reputational damage that will prevent them from gaining new clients. Thus, PCAs operate in a highly competitive environment. PCAs reach financial success not by attempting to inflate sales to a particular farmer client, but rather by providing high quality, cost-efficient service to farmers, building a reputation of success, and then leveraging that reputation to recruit more clients. Total sales commissions rise by increasing the number of clients rather than elevating the amount sold to a particular client.

Finally, although commissions might motivate sales PCAs to recommend a particular pesticide application, the farmer may choose not to accept the PCA's advice. Although some farmers accept virtually all PCA recommendations, others balance the judgement of the PCA against their own appraisal and may choose to decline making a particular recommended pesticide application. The PUR data that we analyzed reflect the actual pesticides used rather than the original recommendations made by PCAs, which may or may not have been followed by the farmer.

Whatever the reason, it seems that commissions received by sales PCAs are not leading to heavier use of pesticides by their client farmers. Robert van den Bosch's conflict of interest hypothesis, which seems so intuitive to so many observers, does not appear to explain pesticide use by today's California farmers. ■

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Featured Article

Interns Find Context Behind the Numbers:

What 3,000 Field Notes Reveal About PCA Decision-Making and Sustainable Pest Management

By Kendall Barton

California's Pest Control Advisers (PCAs) are often evaluated by the numbers — pesticide use reports, application rates, and pounds of active ingredient — but numbers rarely tell the story behind each recommendation. A CDFA-funded grant study, *Evaluating Sustainable Pest Management (SPM) Adoption by Pest Control Advisers in Selected Cropping Systems*, set out to provide that missing context.

More than 100 PCAs across California participated, logging over 3,000 field observations covering more than 6,000 acres of grapes, tomatoes, pistachios, lettuce, almonds, and alfalfa. Four CAPCA interns — Alyssa, Yadira, Nick, and Bryan — coordinated the effort, managing participants, collecting data, and conducting ride-alongs to understand how PCAs make day-to-day decisions in the field.

Managing a Massive Effort

The interns described the project as both intimidating and deeply rewarding. "In the beginning, it was a daunting task," Alyssa said. "As cold calls and emails evolved into ride-alongs and check-ins, many of the participants fully embraced the mentorship opportunity this grant provided."

Yadira agreed. "Conducting cold calls and visiting branches from different companies was intimidating at first," she said. "But every PCA I spoke with really understood the story we were trying to tell. Keeping up with them throughout the season and hearing about the challenges and solutions happening in real time taught me a lot about adaptability and communication."

For Nick, the project mirrored what real-world PCA life looks like. "Trying to stay in contact with all my PCAs by juggling calls and playing phone tag was difficult at times," he said. "But it also taught me how PCAs juggle multiple farms and crops at once — and how geography and local conditions influence decisions."

The Surprising 30 Percent

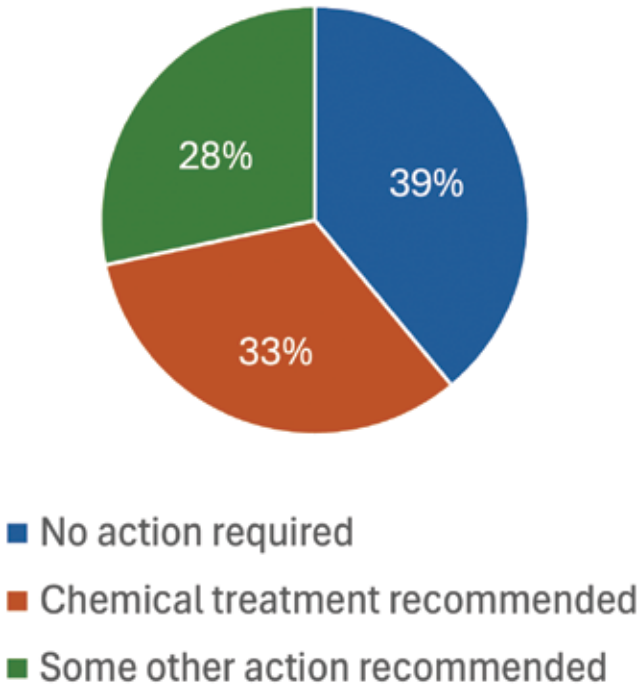
When the data came in, one statistic stood out: **chemical treatments, whether conventional, organic, or biological, were recommended in only 33% percent of field notes. 39% of notes recommended no further action at that time, while 28% recommended some other action like intensified monitoring, adjustment of cultural practices, or mechanical control.**

"I wasn't surprised," Alyssa said. "Pesticide use reports don't give agencies an accurate picture of the responsibilities PCAs carry. Seeing how often they don't recommend a chemical treatment adds important context."

Bryan had similar observations. "Many PCAs told me they try to keep sprays to a minimum, applying only when control will be most effective," he said. "Economic considerations are always part of that decision."

Nick, who grew up on a farm, said the data affirmed what he already knew. "There's a terrible stigma about agriculture doing nothing but spraying," he said. "It was great to see proof that this isn't true."

Yadira was the only one genuinely surprised. "I expected 40–50 percent," she admitted. "We're taught to use chemicals as a last resort, but pest pressure can be unpredictable. Seeing that only 30 percent of field notes recommended chemical treatments really highlighted how much emphasis PCAs place on observation and alternative practices."



Percent of action recommendations reported in PCAs' season-long field notes.

The Complex Art of Recommendation-Writing

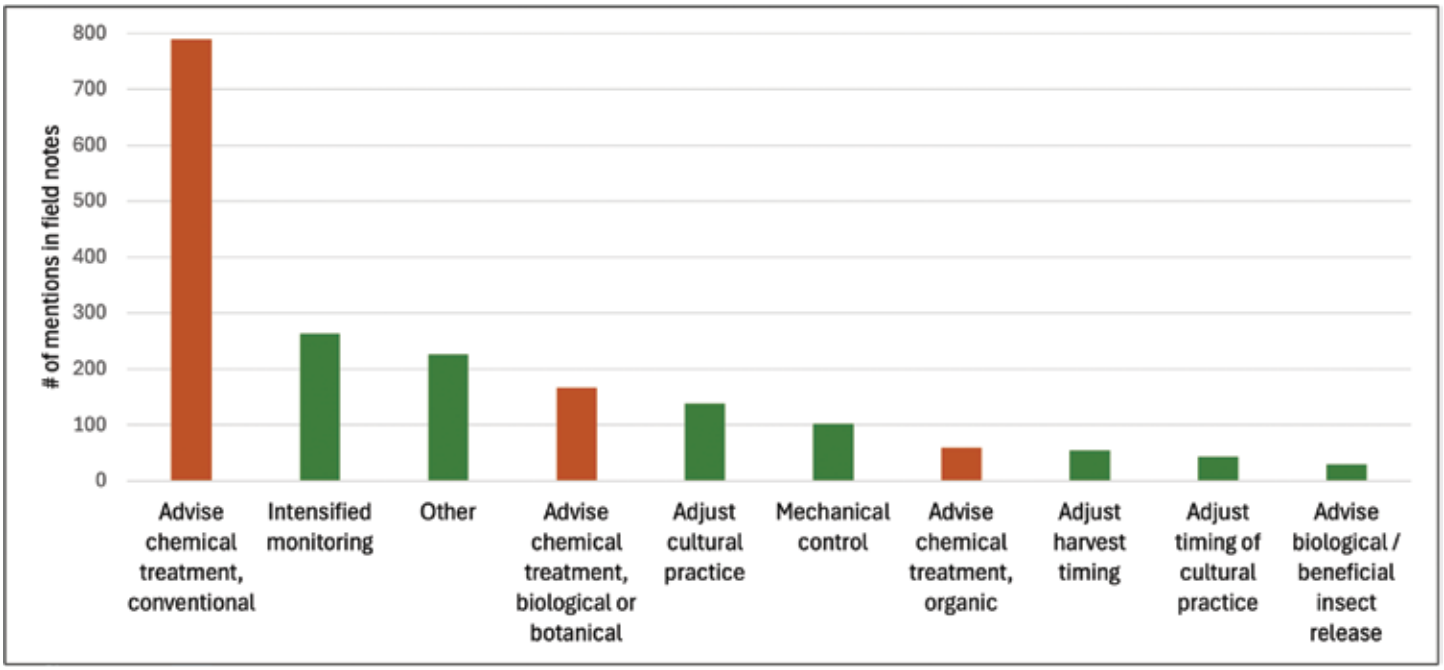
Each intern came away with a new appreciation for how complex recommendation-writing can be.

"There are endless considerations," Alyssa explained. "Weather forecasts, estimated harvest, and next year's planting — a PCA has to think about all of it."

Bryan added that he was "impressed with how many variables are in play — pest biology, crop stage, resistance management, environmental impact, budgets, and regulations. Even coordinating with growers and crews to time sprays is a challenge in itself."

Nick noticed that decisions varied dramatically depending on the field. "Some recommendations come easy because they fit a pattern," he said, "but others require weighing surrounding crops, application timing, and even MRLs."

Yadira recalled one ride-along that changed her view entirely: "The PCA said scouting starts as soon as you drive up to the field — the canopy shadow, leaf color,



Season-long counts of different actions recommended in PCAs' field notes.

even past weather give you clues. There are so many things PCAs evaluate before they even *consider* a chemical."

Redefining What 'Sustainable' Means

An unexpected outcome of the study was to better understand how PCAs interpret sustainability — and whether they see themselves as part of that effort.

"I liked asking each PCA their definition of sustainability," Alyssa said. "Some saw it as a marketing buzzword, but most were optimistic about how the industry is evolving."

Bryan noticed that while PCAs didn't always use the term itself, they were practicing sustainability daily. "PCAs across California are utilizing sustainable practices — they just view it in a different light," he said. "SPM is really an evolution of IPM, not a replacement."

Nick heard similar sentiments. "Most PCAs are trying to be as sustainable as possible," he said. "But market pressures and farm realities make the consumer version of 'sustainable' unrealistic. Still, they're already doing a lot that fits the definition."

Yadira put it simply: "PCAs don't really say 'sustainability.' They talk about being efficient, rotating FRAC or IRAC numbers, using pheromone traps. For them, it's just good pest management."

Sustainability in Action

The interns saw countless examples of sustainable pest management in practice — often in unexpected ways.

Alyssa recalled "bluebird boxes used for leafhopper control in a vineyard," calling it "a creative collaboration that benefited both pest control and local wildlife."

Nick was impressed by a nut grower who layered multiple approaches: "drip irrigation, remote sensing, insect traps, banded applications, bee-safe certification — everything working together," he said.

And Yadira described a pistachio grower who replaced herbicides with sheep grazing. "The sheep helped with weeds and soil health, and the leftover vegetation became natural cover," she said. "Because of minimal pesticide use, beneficial insect activity was high. Seeing that farm showed me that sustainability has a bright future."

Recognizing Hidden Sustainability

Many PCAs were using sustainable practices without labeling them that way.

"A lot of PCAs didn't realize irrigation management counts as SPM," Alyssa said. "Drip irrigation, for example, reduces canopy humidity

Based on crop, precision irrigation is a sustainable pest management tool used to mitigate weed pressure, lower risk of disease, and add vigor to a crop to make it naturally more resistant to pests. Photo credit: Yadira Lucatero

and weed pressure — it's sustainable pest management in disguise."

Yadira agreed. "Almost all the PCAs I met were already implementing SPM practices," she said. "Field history, crop rotation, irrigation management — they do these things because it's good agronomy, but it's also sustainability."

Lessons and Career Takeaways

The experience pushed all four interns to grow professionally. Alyssa said the cold-calling phase "taught me to confidently connect with industry professionals and advocate for the PCA profession." Bryan emphasized learning to "step outside my comfort zone through outreach, recruitment, and presenting at CAPCA chapter meetings."

Nick added that managing contacts and analyzing data "helped me use CRM tools, pivot tables, and SQL — skills that translate directly to modern ag work." Yadira said she became more confident in her communication and organization: "It helped me learn how to ask the right questions, listen closely, and find patterns in the data."

All four said the internship solidified their career paths. Bryan and Nick both plan to pursue PCA licenses, while Alyssa and Yadira are exploring PCA and in-house roles that integrate sustainability and grower support.

A Message to PCAs

Each intern hopes the PCA community recognizes how significant their work is.

"It's never too late to become an advocate for the subjects you're passionate about," Alyssa said. "Be proactive, not reactive, about the changes coming to agriculture."

Nick encouraged PCAs to remember their long-term impact: "Even if growers just see you as a salesperson, your influence lasts for years — you're helping farms adapt and improve."

(Continued next page)

And Yadira added: "I hope PCAs see how respected their work is. They shape how the next generation understands sustainable pest management — combining science, technology, and real-world knowledge."

Conclusion

For DPR, CDFA, and OPCA, this study delivers valuable insight into what pesticide use reports can't show: the judgment, restraint, and sustainability already embedded in PCA decisions.

For the interns, it offered something even more lasting — a firsthand education in the thoughtful, adaptive, and deeply human side of pest management.

As Alyssa summed it up, "Sustainability isn't a label — it's the living, evolving way PCAs approach their work every day." ■

Alyssa Lindberg
Central California Intern

CAPCA STATE OFFICE HOLIDAY HOURS

Holiday Closure Dates:

The CAPCA state office will be closed from Wednesday, December 24, 2025, through Friday, January 2, 2026, for the Christmas and New Year's holidays.

Regular operations will resume on Monday, January 5, 2026.

Member Support Availability:

Support for the website, CE Hours Reported, and online CE will be available only during regular business hours prior to the holiday closure.

If you need assistance, contact us before noon on Friday, December 19, 2025, at 916-928-1625 or at support@capca.com

Don't Delay – Act Today!

The DPR license renewal process underwent significant changes in 2024.

Be sure to visit CAPCA's DPR Renewal Hub for guidance at capca.com/dpr-renewal-hub

Be sure to renew your CAPCA Membership before January 1, 2026 to ensure no gap in your benefits. You may also purchase your 2024 and 2025 Memberships. Wishing you and your loved ones a joyful and peaceful holiday season! —The CAPCA Staff

Nick Mello
Northern California Intern

Bryan Aguilar
Southern California Intern

Yadira Lucatero
Southern San Joaquin Intern

Featured Article

Growers Embracing Biopesticides:
Trends from DPR's 2023 Pesticide Use Report

By Jeana Cadby

The latest annual Pesticide Use Report (PUR) from the California Department of Pesticide Regulation (DPR) reports a significant increase in biopesticides used in agriculture. With increased availability of biopesticides, regulatory pressure, and changing pest pressures, it is not too surprising to see this industry shift. However, while growers and Pest Control Advisers (PCAs) are increasingly trialing and incorporating biopesticides into their pest management programs, major hurdles to adoption remain the same: overcoming the efficacy, cost, and consistency challenge.

Biological products for decades have been facing the long uphill battle to shake off their bad rep in the fresh produce industry. Biopesticides (Figure 1) are no exception, despite registered products undergoing the intensive federal and state registration gauntlet, to include efficacy requirements from California's DPR. Despite these challenges, the 2023 PUR shows increased adoption in both lbs of AI and total acres with biopesticides applied in California. So, does this mean that growers and PCAs are trading in traditional pesticides for biopesticides?

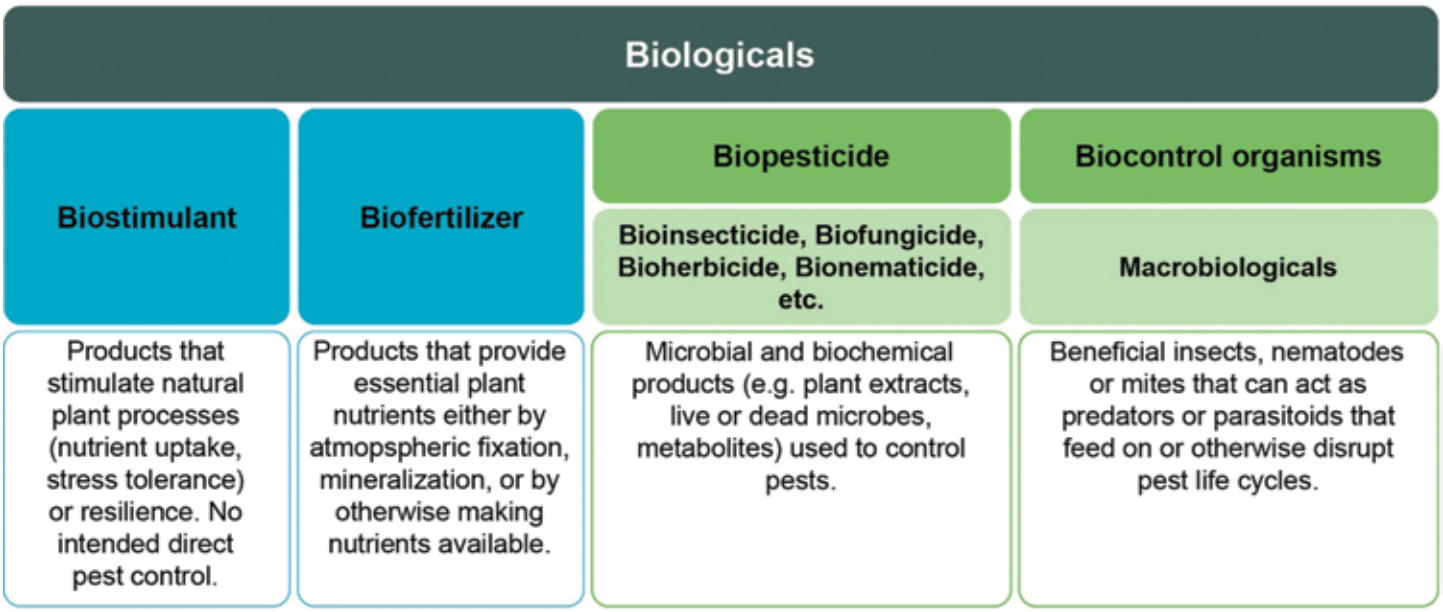


FIG. 1. The Biologicals Landscape: Biostimulants, biofertilizers, biopesticides, and biocontrol organisms make up the biologicals landscape. Definitions will differ by country and regulatory framework. Source: *Biopesticides in Horticulture: Guidelines for Commercial Field Trials, Grower Assessment, and Industry Adoption, 2025 International Biopesticides Research Workshop Summary, Western Growers and Bioeconomy Science Institute.*

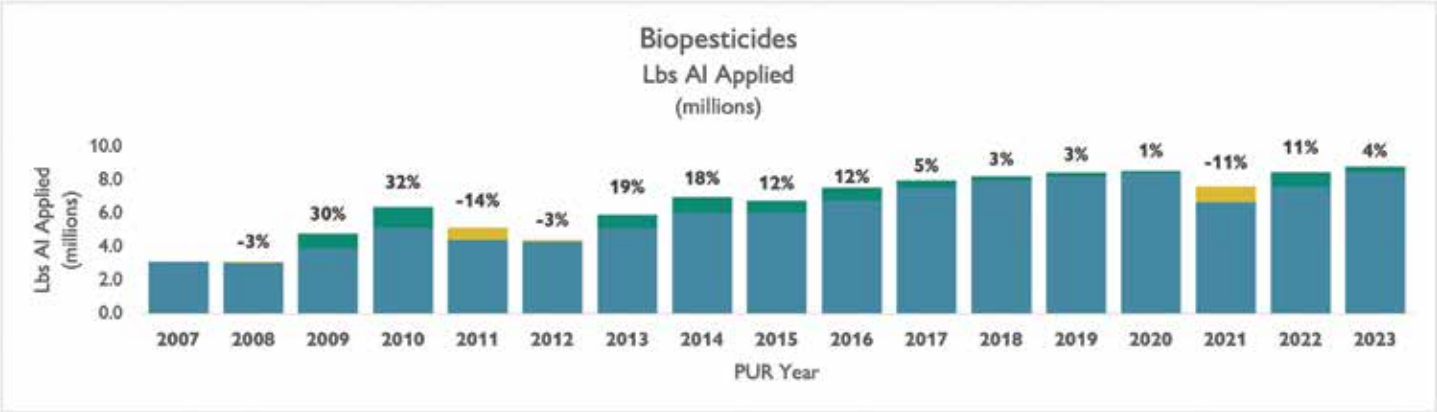


FIG. 2. Pounds (lbs) of Active Ingredient (AI) Biopesticides applied per PUR year between 2007-2023. Green indicates lbs in millions (%) increase from previous year and yellow indicates decrease from previous year. Values are from most recently available PUR for the year indicated, some discrepancies between PURs. Source: California Department of Pesticide Regulation Pesticide Use Reports.

Accessibility

The PUR shows a 4% increase in biopesticide use between 2022 and 2023, part of a longer-term trend of increased use of biopesticides, with a few exceptions (Figure 2). In fact, biopesticide applications (lbs/ of AI) have increased 182% since the PUR reports became available (2007 to 2023)*.

In 2023, DPR registered 18 pesticide products containing 10 different new AIs. Of those 18, six were biopesticides, two were adjuvants, one was a turfgrass herbicide, and one was an antimicrobial for hard surfaces, demonstrating an overall increased availability of biopesticide products to growers, and limited registration of new non-biopesticide AIs.

DPR attributes these shifts to a combination of factors, including regulatory restrictions on certain high risk active ingredients, evolving market demands for lower residue produce, and the growing availability of integrated pest management (IPM) tools and biologically based alternatives. For growers and PCAs, the adoption of biopesticides may simply come down to access to tools that carry fewer regulatory constraints, reduced risks of residue-based export interactions, and a lack of new non-biological AIs available on the market.

Acreage

When calculated by total acres with biopesticides applied, the PUR notes a 6% increase from 2022-2023. However, 2023 acres are still lagging since the "peak" of acres with biopesticide applied in 2019 at a little over 8.5 million acres. Zooming out, total acres with biopesticides applied in 2023 are still 5% behind 2019 acres (Figure 3).

This decrease in acreage is likely due to the reduction in total agricultural production acreage over the past few years. According to the 2023-2024 California Agricultural Statistics Review, acres devoted to farming and ranching in California dropped down from 24.2 million acres in 2022 to 23.8 million acres in 2023. This is likely due to California farmers enduring the driest three-year period on record from 2020-2022, resulting in chronic severe drought throughout the state, among other factors. According to a 2022 CDFA report, statewide irrigated crops dropped due to drought conditions 563,000 acres in 2021 (7.4% of the total acreage covered in the study) and 752,000 acres in 2022 (nearly 10%) when compared to 2019 statistics. Similarly, California organic production site acreage decreased by 13% from about 2 million acres in 2019 to about 1.8 million acres in 2023, according to the 2023-2024 California Agricultural Organics Report.

*In terms of calculating actual applied pesticides, the PUR aggregates annual reported lbs. of AI and total applied acres, to capture total pesticide use in the state in 2023. The report notes, *"cumulative acres treated for a crop may be greater than the planted area of the crop since this measure accounts for a field being treated with the same active ingredient (AI) more than once in a year. For example, if a 20-acre field is treated three times in a calendar year with an AI, the cumulative acres treated would be reported as 60 acres while the area planted would be reported as 20 acres."* Ideally, if the PUR could provide an analysis of lbs AI applied per acre per crop, we could better identify other factors that influence reported numbers.

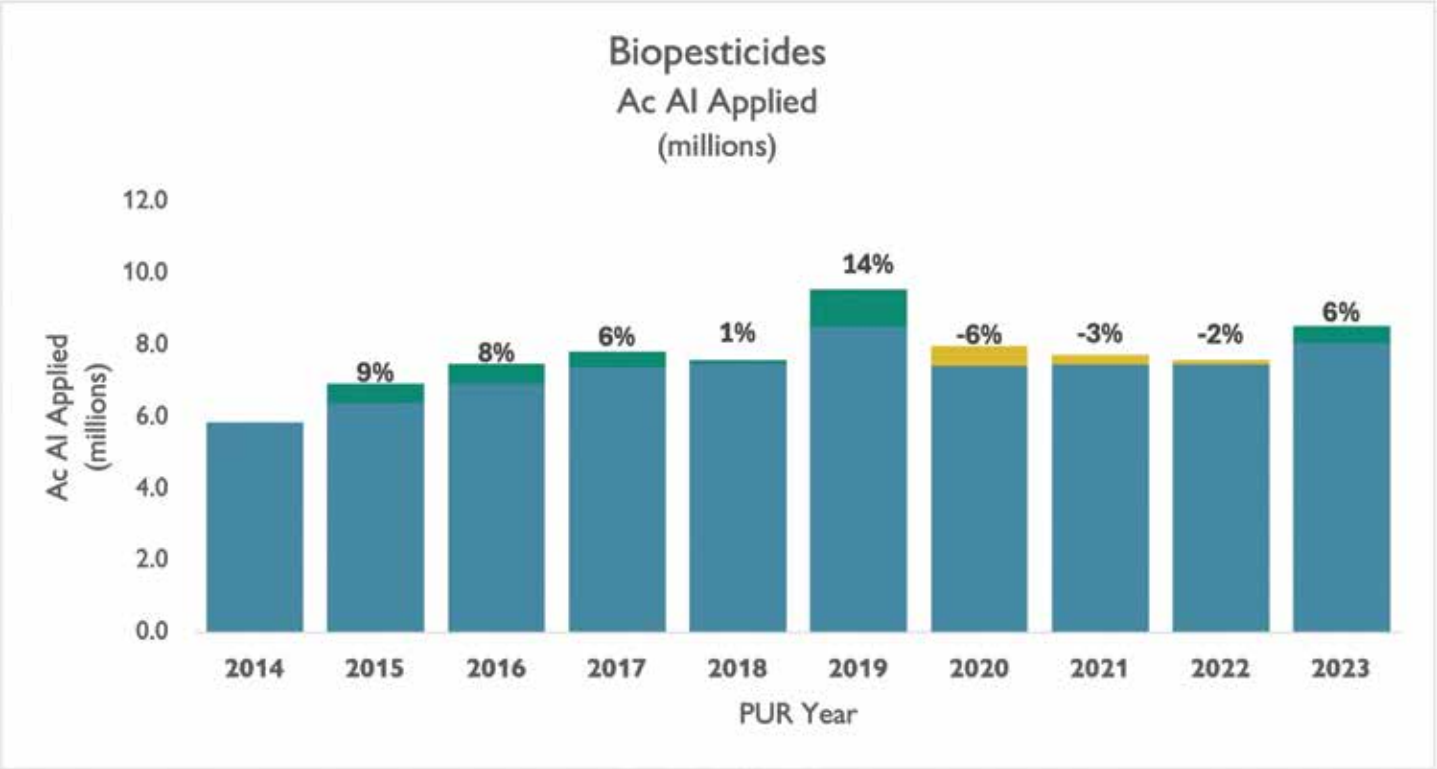


FIG. 3. Acres with of Active Ingredient (AI) Biopesticides applied per PUR year between 20014-2023. Green indicates acres in millions (%) increase from previous year and yellow indicates decrease from previous year. Values are from most recently available PUR for the year indicated. Source: California Department of Pesticide Regulation Pesticide Use Reports.

However, the PUR trends also show an overall decrease in pesticide use, generally. Compared to 2022, approximately 176 million pounds of total pesticides (both biological and traditional) were applied in 2023, roughly a 3% decline. Biopesticides still represent a relatively small share of total pesticide volume, and reductions in pesticide use, though significant, can also reflect broader factors such as acreage shifts, changes in cropping patterns, and year-to-year pest pressures. Either way, this dynamic could further imply that growers and PCAs might be swapping out traditional chemistries with biopesticides.

Challenges

Success for biopesticides will be defined by demonstrable consistent efficacy, clear Return on Investment (ROI) for growers, environmental compatibility, and ease of integration into existing practices. Further, the sheer volume of products and formulations on the market today make it very challenging to navigate the biologicals landscape. A 2024 overview on the Crop Biocontrols Landscape identified over 300 companies delivering biopesticides alone. On top of that, in a 2022 survey, 56% of respondents cited a lack of trust/lack of efficacy as the key barrier for adoption of biologicals (Figure 4).

This past year, Western Growers, in collaboration with the Bioeconomy Science Institute and other industry specialists focused on biopesticides developed "Biopesticides in Horticulture: Guidelines for Commercial Field Trials, Grower Assessment, and Industry Adoption' to help guide this conversation. The guidelines emphasize that biopesticide trials under commercial field conditions are essential to assess performance amid variations in climate, soil, water quality, and integration with existing pesticide programs. Further, trials must be designed to generate credible

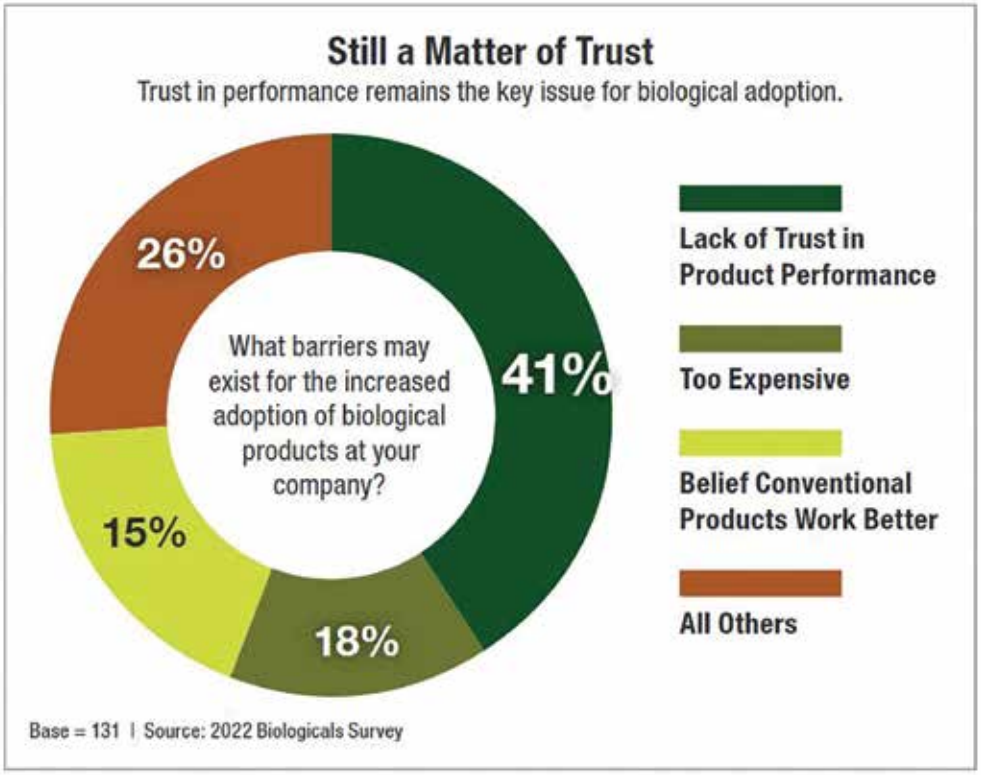


FIG. 4. Biologicals Survey results identifying barriers for adoption of biologicals in 2022. Source: Biologicals Gaining Some More Traction, Crop Life America

data on efficacy, economic return, and environmental compatibility while supporting regulatory compliance and grower confidence.

The 2023 PUR serves both as a benchmark of progress and as a reminder of the work ahead, necessary to support our growers and PCAs success in California's pest management landscape. While biopesticides still represent a modest share of total pesticide use, the upward trend in both availability and adoption demonstrates how growers and PCAs are continuously innovating and exploring new strategies and opportunities. Amid regulatory pressures, limited new chemical alternatives, and evolving market demands, growers and PCAs are stepping up to trial, refine, and integrate biopesticides into farming programs in order to continue to produce safe, affordable, and high-quality fresh produce. ■

WANT TO READ MORE?

Scan the QR code to find the full Pesticide Use Annual Report for 2023 published by DPR in June 2025.

Featured Article

Fungicide Resistance Monitoring and Management in US Vineyards

Lexi Heger – Ph.D. Candidate - Michigan State University
Timothy Miles – Associate Professor - Michigan State University
Monica Cooper – Viticulture Farm Advisor - UC Cooperative Extension-Napa County
Michelle Moyer – Professor - Washington State University

Introduction

The phrase "fungicide resistance" strikes fear and frustration into growers across cropping systems nationwide. The development of fungicide resistance in plant pathogens is well known, especially in high value specialty crops that require frequent fungicide inputs. Within specialty crops, like grapes, the threshold for quality is higher than many other crops. Not only does disease affect flavor, but blemished grapes are also not as appealing (or as marketable) as those that are perfectly intact, which is especially important in table grapes. Grapes have not been untouched by the challenges of fungicide resistance, and there have been recent control failures and yield losses associated with fungicide resistance in powdery mildew (*Erysiphe necator*) and botrytis bunch rot (*Botrytis cinerea*). Control failures happen when field-level resistance occurs. Field-level fungicide resistance is defined as when the use of a specific fungicide active ingredient or class no longer controls disease at economically-viable thresholds. This is different than general resistance, which could be present in an individual within a pathogen population, and where a fungicide still may work at a site when most of the individuals in that population at that site are still sensitive to the fungicide.

The FRAME website (https://framenetworks.wsu.edu/) is a one-stop shop for grape growers, PCAs, and educators looking for information on fungicide resistance management in vineyards. Linked on the website are tools, such as mobile apps and field guides, providing information on disease monitoring and rating, FRAC codes and their interpretation, and sprayer calibration.

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Can We Slow Down the Fungicide Resistance Race? Fungicide Resistance Monitoring and FRAME.

Starting as early as 2015 in the western US, and likely earlier in the eastern US, grape growers experienced control failures in grape powdery mildew associated with the use of FRAC 11 fungicides (QoI; strobilurins). This prompted a group of scientists from across the country to team up and address the *why* and the *how* of this seemingly sudden rise in FRAC 11 resistance. In 2018, the FRAME Networks team was brought together with financial support from the USDA-NIFA Specialty Crops Research Initiative (project #, 2018-03375 titled **F**ungicide **R**esistance **A**ssessment, **M**itigation and **E**xtension Network for Wine, Table, and Raisin Grapes). The initial FRAME project (2018-2023) sought to

empower growers to re-think how they choose and apply products by providing grape growers and crop consultants with educational resources, trainings, and applicable research on FRAC 11 fungicide resistance in grape powdery mildew.

The first approach FRAME took was to develop tools to improve detection and monitoring of FRAC 11 resistance in grape powdery mildew. This was achieved using a rapid molecular test (qPCR) (Miles et al. 2021), and improved protocols for collecting powdery mildew samples, including glove-swabbing (Lowder et al. 2023) and air sampling (Mahaffee et al. 2023; Check et al. 2024). FRAME offered this testing to grape producers across the USA from 2019-2022. During the initial project, thousands of samples from across the country were tested, providing access to growers and allowing scientists to evaluate optimal methods for monitoring resistance presence. This large-scale, multi-year survey demonstrated that FRAC 11 fungicide resistance was rampant across the US (Figure 1).

Using Fungicide Resistance Monitoring to Improve Disease Control

While the FRAC 11 testing offered through FRAME is complete, there are a limited number of diagnostic labs offering FRAC 11 fungicide resistance testing. But this number could be higher. If you have a commercial or public plant disease diagnostic lab near you, reach out to see if they offer FRAC 11 fungicide resistance testing, and if not, what they might need in order to do so. In many cases, there needs to be enough demand for a diagnostic lab to be able to offer a testing service at a reasonable price. To confirm if a diagnostic lab or clinic in your area offers FRAC 11 testing, call or email the lab directly.

Action plans for how to interpret, and adjust spray programs based on test results, are available on the FRAME website (https://framenetworks.wsu.edu/grower-information/). These action plans include how to approach spray program adjustments in the current and following-season if a positive detection of FRAC 11 resistance is reported (Fig. 2). These action plans also have information on how to respond based on when in the growing season FRAC 11 fungicide resistance was first detected.

This is why it is important to consider when you are monitoring and testing. While resistance is more likely to develop in the latter part of the season, after foliar growth has slowed, monitoring for FRAC 11 resistance throughout the entire season can ensure appropriate actions are taken in a spray program to ensure the

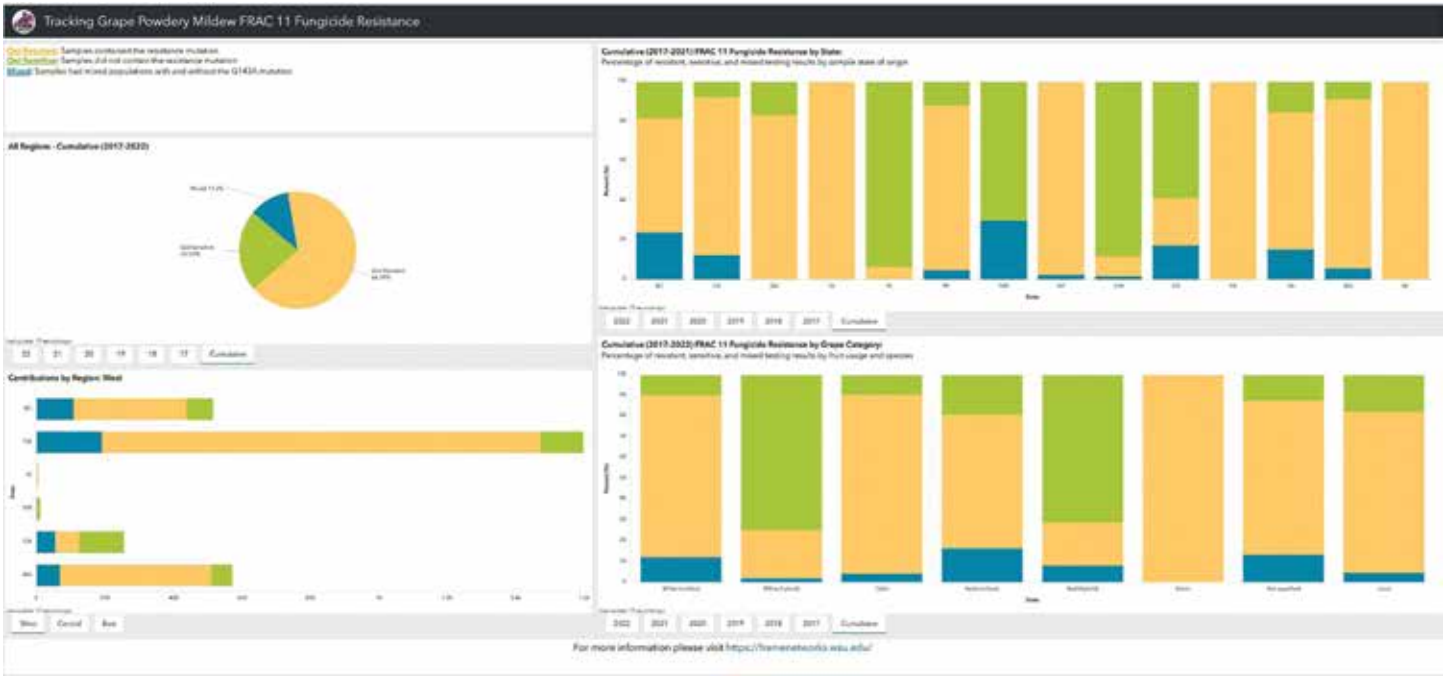

FIG. 1. Monitoring for FRAC 11 fungicide resistance in Erysiphe necator from 2017-2021 indicated that resistance was present across the country. Yellow = FRAC 11 resistant, blue = mixture of FRAC 11 resistant and sensitive, and blue = FRAC 11 sensitive.

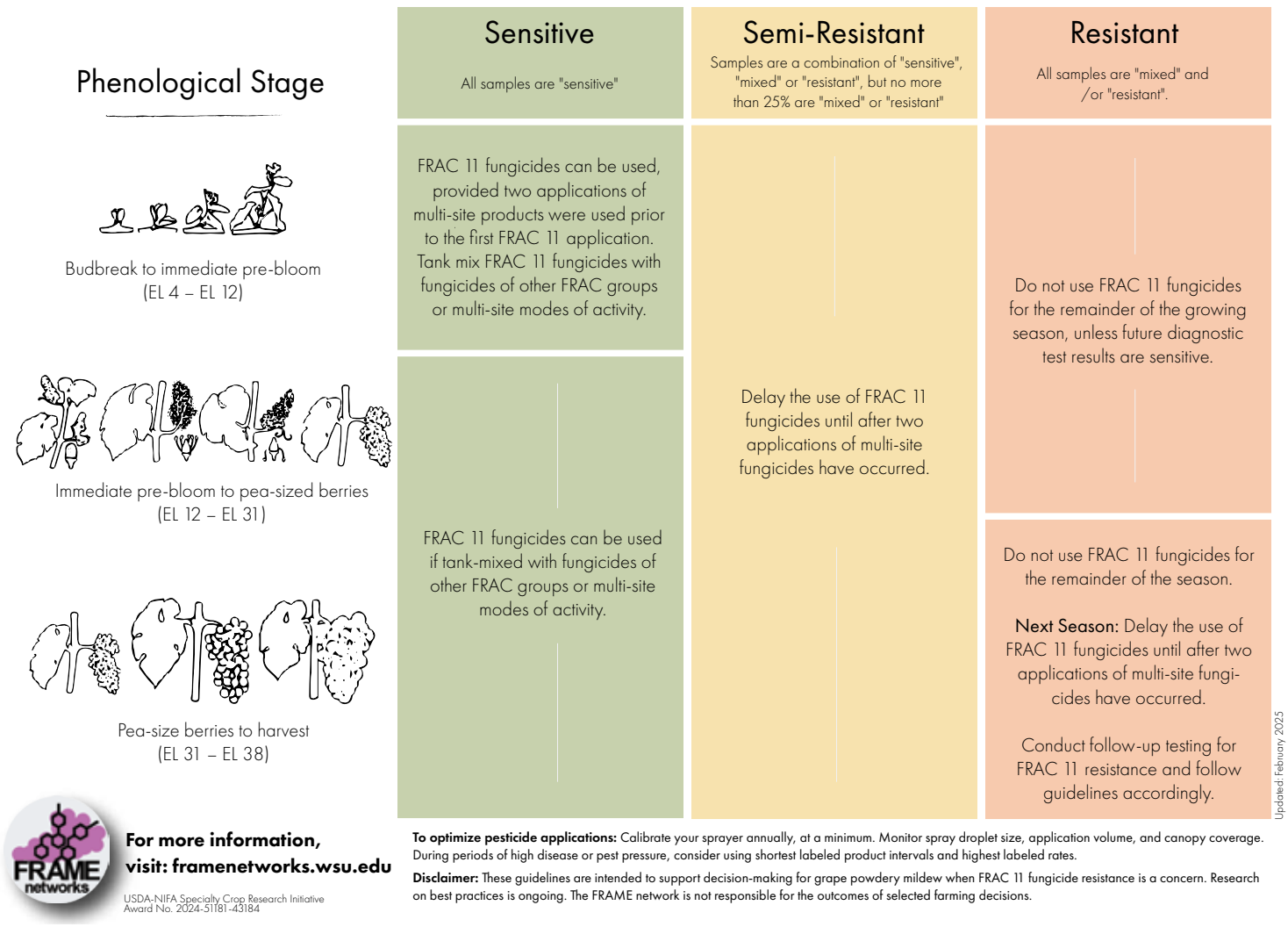

FIG. 2. When the grape powdery mildew population has detectable levels of FRAC 11 resistance changes how one might approach their powdery mildew management program. The FRAME team has developed this decision tree to help determine what in-season next-steps are. But in order to make the best decision regarding FRAC 11 resistance, you need to know if it is a problem at your vineyard.

longevity of FRAC 11 fungicide use at that site (Figure 2). When powdery mildew samples are identified as completely resistant prior to bloom, it is best to avoid FRAC 11 fungicides for the rest of the year to reduce the likelihood of crop loss this season. When a sampling shows that less than 25% of samples are resistant or *both* sensitive and resistant to FRAC 11 at any point in the season, it is a good idea to temporarily pause the use of FRAC 11 fungicides. This is especially important around the bloom time period when grape berries are their most susceptible to powdery mildew. Change to another FRAC group to prevent further selection of FRAC 11 resistance, and consider adding multi-site fungicides (e.g., sulfur) into the tank to eradicate existing FRAC 11 resistant populations. Testing at multiple points in the growing season, rather than just the beginning and end, allows you to track resistance levels as they develop. This provides an opportunity to modify upcoming fungicide sprays and reduce resistant inoculum before the end of the season.

A note of caution: Be careful when redesigning spray programs that reduce or eliminate the use of a single FRAC code, such as FRAC 11. While rotation is a good practice, over-relying on remaining FRAC groups can then shift the selection pressure to those groups. Fungicide resistance mitigation is not just about fungicide rotation from one high-risk group to another;

it is also about the use of low-risk products such as multisite or biologically-based fungicides, and the incorporation of cultural management practices.

It's Not Just What Fungicides You Use – It's How You Use Them.

Knowing how to use fungicides responsibly does not always mean that is how they are actually used. The practice of good fungicide stewardship takes time, consistency, and a clear understanding of resistance risks in your region. A national survey of grape growers found that most respondents are familiar with FRAC codes, but how to use that information had some confusion (Oliver et al. 2021). For example, while viticulturists and crop consultants recognized the difference between rotating FRAC codes and rotating fungicides based on product trade names (which may or may not be differing FRAC groups), others on the farms (such as laborers and owners) did not have the same understanding. It's important to make sure everyone on the farm understands why spray regimes are designed the way they are, as that provides an extra set of eyes when reviewing for potential flaws in program design. This same survey also found that while there might be some confusion related to some of the concepts of fungicide resistance management, one thing is clear – grape growers recognize the challenge fungicide resistance poses for their industry.

Fungicide use data from 2009-2020 showed that that tank mixing is more prevalent across the entire season in vineyards in eastern U.S. vineyards as compared to farms in the west (Oliver et al. 2024). This is due to more complex disease pressures found in the east (downy mildew combined with powdery mildew and botrytis) as compared to those on the west coast. This is also why east coast grape growers have been able to extend the use of fungicides with known resistance – by tank mixing, they can use the at-risk fungicide to target one disease, while using a multi-site fungicide to target pathogens with known fungicide resistance. This provides some hope for west-coast growers. By utilizing more tank-mixes early in the season—especially with multi-site products—we can extend the practical like of higher-risk fungicides and use them when they matter most or when multi-site or contact products are more likely to face challenges related to spray (heat, wind) or canopy conditions (excessive or dense growth).

Spray programs need to be flexible to account for changing weather patterns, resistance risk, and disease pressure over the course of a season (See: Good To Know: Dialing In Disease Control; https://goodfruit.com/good-to-know-dialing-in-disease-control/). This is why it is critical to plan for alternatives (incorporating new FRAC groups) when high-risk groups start to lose effectiveness. Identifying resistance and modifying spray programs is a key to fungicide stewardship and helps preserve the longevity of high-risk fungicides.

Where Do We Go From Here?

Fungicide resistance is not just a problem with grape powdery mildew, nor is it unique to FRAC 11 fungicides. Nearly all synthetic fungicides are at risk of developing some level of resistance over time in grape pathogen populations. Thus, FRAME is moving forward with funding from USDA-NIFA-SCRI (Award # 2024-51181-43184 titled "Pathogen Monitoring and Disease Management Within a Vineyard FRAMEwork") to expand our ability to effectively monitor vineyards for multiple pathogens and to rapidly test for fungicide resistance to other FRAC groups **(Figure 3)**. We are creating additional resources for grape growers, crop consultants, and extension professionals to improve uptake and awareness of fungicide resistance mitigation strategies.

This is timely, as we have documented fungicide resistance in Botrytis bunch rot (Botrytis cinerea) to FRAC 1, 2, 7, 9, 11, 12, and 17 fungicides, and in many cases, the pathogen is resistant to multiple fungicide classes (Alzohairy et al. 2021, Naegele et al. 2022). Cross resistance, or resistance to multiple fungicides in a FRAC group, is also a concern. We have found that new fungicides developed within FRAC 7 (SDHIs) (e.g., Miravis or Kenja) appear to be less effective if samples are already resistant to older FRAC 7 fungicides (e.g., Endura) (Alzohairy et al., 2023). We also have reported resistance in grape downy mildew (Plasmopara viticola) to FRAC 4, 11, 21, 40 and 45 fungicides (Salcedo et al. 2021, Sharma et al. 2025). Fortunately, though, we have molecular tools to detect mutations related to FRAC 1, 7, 11, 17, and 40 resistance that can help us with monitoring. Currently these tools work in a similar fashion to the already developed for FRAC 11 powdery mildew resistance (i.e., qPCR). It is possible that the current strategies we use to monitor for FRAC 11 resistance in grape powdery mildew could be employed to monitor for resistance in Botrytis bunch rot and grapevine downy mildew (i.e., glove swabbing and air

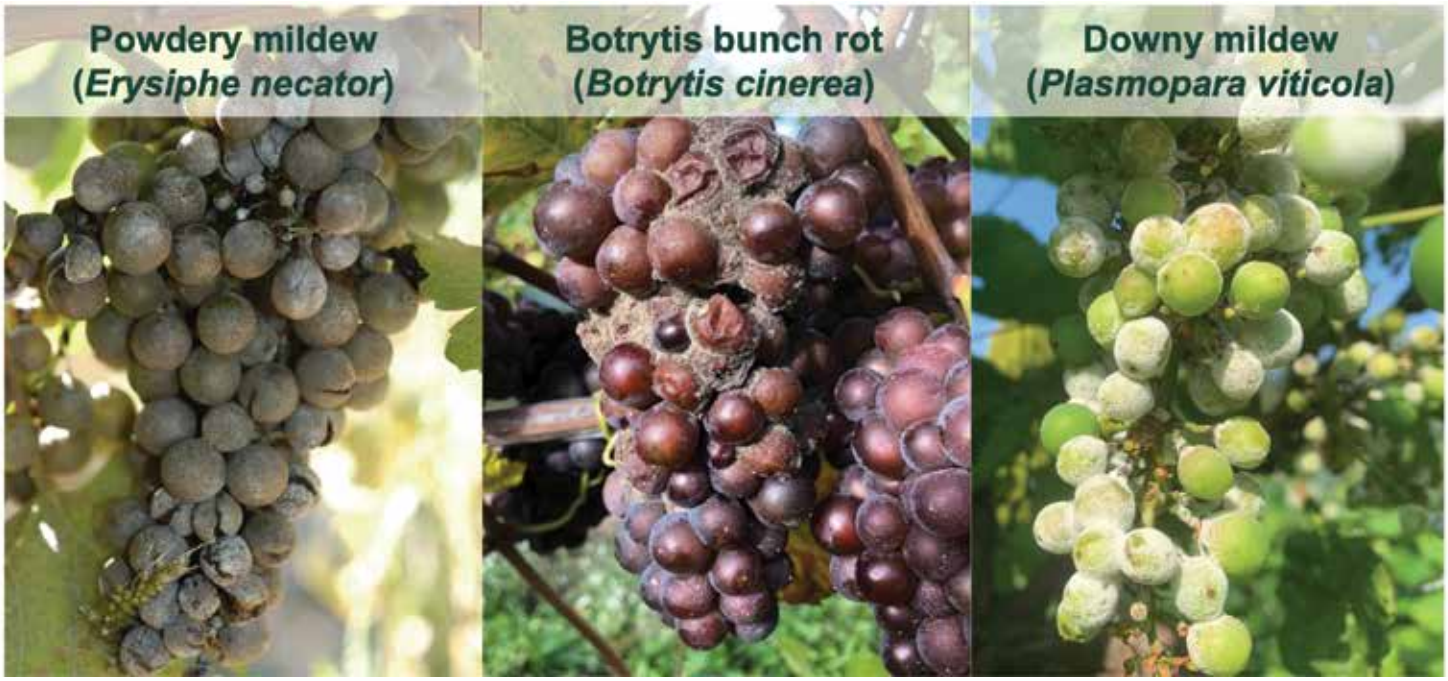

FIG. 3. Over the next couple of years, the FRAME team will be working on improving pathogen detection, and rapid fungicide resistance testing, for three main grapevine diseases – powdery mildew, Botrytis bunch rot, and downy mildew.

impaction samplers). The FRAME team is testing this and expanding pathogen monitoring approaches to make these tools more efficient and effective for monitoring multiple pathogens simultaneously in a vineyard setting.

We also recognize that for best practices to be applied, everyone involved in grape disease management needs access to, and understand, information on current best practices. The FRAME team (https://framenetworks.wsu.edu/people/) is developing a training program for crop consultants, viticulturists, and extension professionals, that specifically focuses on grape disease management, best practices for fungicide resistance mitigation in grape disease management, and how to build local grape grower networks to share this knowledge. Check out the FRAME website for virtual training opportunities starting in 2026!

Final Thoughts

Fungicide resistance does not have to be a fear-inducing phrase. Through effective disease management practices, diligent pathogen monitoring, and thoughtful management tool selection, we can reduce the likelihood of future field-level control failures. The FRAME team is here to help make that future a reality.

This work is supported by the Specialty Crop Research Initiative Award No. 2024-51181-43184 titled "Pathogen Monitoring and Disease Management Within a Vineyard FRAMEwork,' from the U.S. Department of Agriculture's National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and should not be construed to represent any official USDA or U.S. Government determination or policy. ■

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Featured Article

DPR Recap: Advancing Sustainable Pest Management in California

In October, Department of Pesticide Regulation Director Karen Morrison joined CAPCA in Reno, Nevada, for their annual conference and to update California's licensed pest management and pest control professionals about the department's vision and work.

As Director Morrison shared with CAPCA, DPR's many programs work together to advance a mission to protect people and the environment and achieve a vision where pest management is safe, effective and sustainable for all Californians and the environment and the input and dialogue with all people interested and impacted by pest management is critical to inform this work.

Director Morrison was sworn in as Director early in 2025 and has spent much of the year meeting with stakeholders and visiting farms, communities and attending events to meet with Californians interested in or impacted by pest management and pesticide use – including with CAPCA leadership and PCAs whose work directly impacts how pest management can be done effectively and safely. These important conversations and field trips impact the practical next steps and department's work to achieve its key strategic goals:

1. Increase Access to Safe, Effective, Sustainable Pest Management
2. Track, Evaluate, and Enforce Safe Pesticide Use
3. Foster Engagement, Collaboration and Transparency
4. Promote Organizational Excellence and Innovation

Morrison shared her vision as director with CAPCA members in October: Support the continued work of the department to achieve goals and objectives outlined in the department's 2024-2028 Strategic Plan, including meaningful opportunities for connection with stakeholders, providing access to training and education and fostering sustainable pest management (SPM), among many other key initiatives for the department.

Fostering SPM is key to advancing California's vision for safe and effective pest management. This year, the department has reached several milestones that have advanced its goals and reflect the vision for SPM statewide.

Morrison on an ag tour in Kern Co.

Morrison participating in a demonstration of a DPR produce-residue inspection

Educational resources

Licensees are on-the-ground practitioners of IPM and SPM practices every day and often the first to see if methods and approaches are effective and economically viable. To help spread the knowledge to all pest management professionals, education and training are important and support broader SPM adoption. Continuing education (CE) courses provide a very effective way for licensed applicators and pest control advisers to stay up to date on the latest SPM tools, approaches, trends, and practices.

In July, DPR provided new and updated CE resources for licensees, including an updated course list. DPR also updated guidance for CE course sponsors to incorporate SPM and is developing CE instructional videos. The department continues to share out renewal reminders, helpful tips and CE support materials through its email distribution list, which is an important resource to stay updated on key renewal dates for licensees.

As a reminder – submit your renewals as soon as possible. More info: cdpr.ca.gov/renew-a-license/

Pesticide Prioritization through DPR's New Scientific Prioritization and Review Committee

In October, DPR opened nominations for a new Scientific Prioritization and Review Committee (SPARC), which will provide science-based recommendations to inform the department's transparent, data-driven process for identifying and addressing potential risks to human health and the environment from pesticide use. SPARC will include up to 15 external members with scientific and practitioner expertise in specific fields. Once established, the committee will meet quarterly and serve as a public forum for discussing potential priority actions, including risk assessments, data requirements, mitigation development, and, when warranted, product cancellation.

SPARC will serve in an advisory capacity to DPR to:

- Provide science-based recommendations on relative priority of potential continuous evaluation or mitigation actions.
- Provide input on identification of data gaps, scope of scientific assessment, and feasibility of alternatives.
- Help DPR identify where early investments in alternatives may be needed.

DPR's final decisions on priority actions will be reflected in the Continuous Evaluation and Mitigation Update Table (cdpr.ca.gov/look-up-pesticide-info/continuous-evaluation-and-mitigation-update/), which will be updated at least annually.

More information on the how a pesticide is prioritized for action and the role of SPARC can be found on DPR's website: Scientific Prioritization and Review Committee (SPARC) and DPR Prioritization of Pesticide Actions (cdpr.ca.gov/wp-content/uploads/2025/10/sparc_fact_sheet.pdf)

New Committee: SPM Advisory Committee

In November, DPR opened a call for nominees for a new Sustainable Pest Management Advisory Committee to support DPR's implementation of key strategic goals to foster SPM.

DPR Director Karen Morrison and staff joined the Center on Race, Poverty & the Environment (CRPE), community members, and colleagues from CalEPA's Office of Environmental Health Hazard Assessment (OEHHA), California Air Resources Board (CARB), and the California Water Boards for an environmental justice tour through Kern County.

Karen Morrison joined California Department of Food and Agriculture Secretary Karen Ross, UC ANR Vice President Glenda Humiston, and eight other agricultural leaders this summer on a tour of Sao Paulo, Brazil that examined farmers' adaptation to a warming climate and increased pest pressures.

The formation of the SPM Advisory Committee was a recommendation included in the Sustainable Pest Management Roadmap for California, which was developed and released by a cross-sector workgroup in January 2023 to provide recommendations to the state for a systemwide transition to more sustainable pest management. The aim of the SPM Committee is to advise DPR on goals, tactics, policies, and partnerships that support the implementation of SPM statewide.

Once launched, the SPM Committee will publicly discuss opportunities and barriers for SPM adoption across California and identify opportunities for education, engagement, partnerships, and collaboration and discuss statewide progress towards the implementation of SPM systemwide. This committee is an important opportunity for Pest Control Advisors (PCA) and other practitioners to lend their practical, on-the-ground experience and expertise to provide recommendations to the state for a systemwide transition to more sustainable pest management.

For more information on DPR committees visit Committees - Department of Pesticide Regulation (cdpr.ca.gov/committees/).

Stay Informed

While this provides just a summary of some of the updates Director Morrison provided to CAPCA and that DPR is tracking, there are many ways to stay up-to-date on DPR's work, including:

- **Visit** our re-designed website at cdpr.ca.gov
- **Sign up** to receive email updates for specific topics at https://public.govdelivery.com/accounts/CADPR/subscriber/new

A Note from Karen Morrison

Pest management is a critical tool for everyone – whether at home, in the fields, in our wildlands or in urban and workplace settings. As I reflect on my time talking with all of you at the CAPCA Conference, I am grateful for the professionalism and enthusiasm by many of you to explore the most effective and sustainable pest management approaches in your work. I encourage PCAs to apply for our upcoming committee opportunities and continue to partner on trials, testing and adopting new approaches, technologies and alternatives. Thank you for the time and continued work with DPR as professional licensees. ■

DPR Electronic Mailing List Subscriptions

Scan the QR code to sign up for one or more email lists covering a range of topics:

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