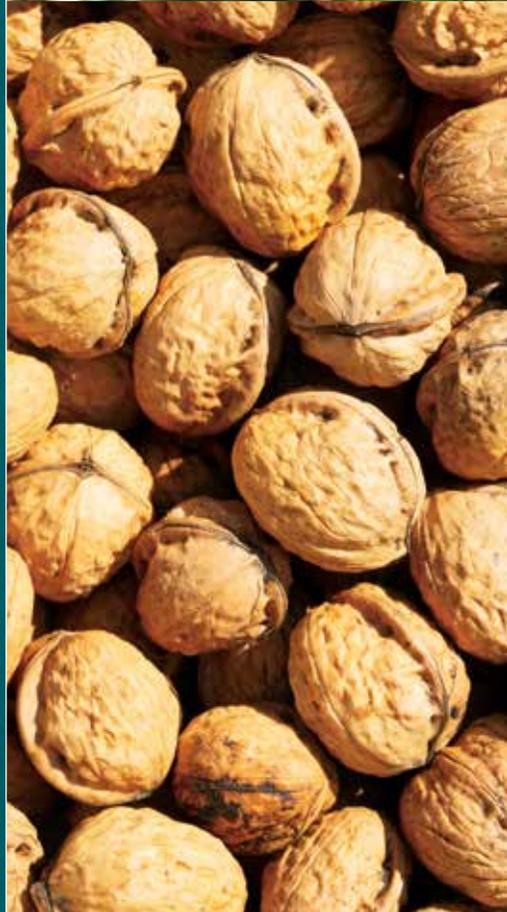


THE ADVISER



California Association of
Pest Control Advisers

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Contents



FEATURES

34

Implementing biological control for invasive brown marmorated stink bug in California

42

Brown marmorated stink bug research update in California almond orchards

46

Pomona Farming Charging Forward in IPM Achievements

DEPARTMENTS

05 Editor's Notes

06 Leadership

08 Conference Recap

24 Advocacy

52 Membership

56 Innovation & Technology

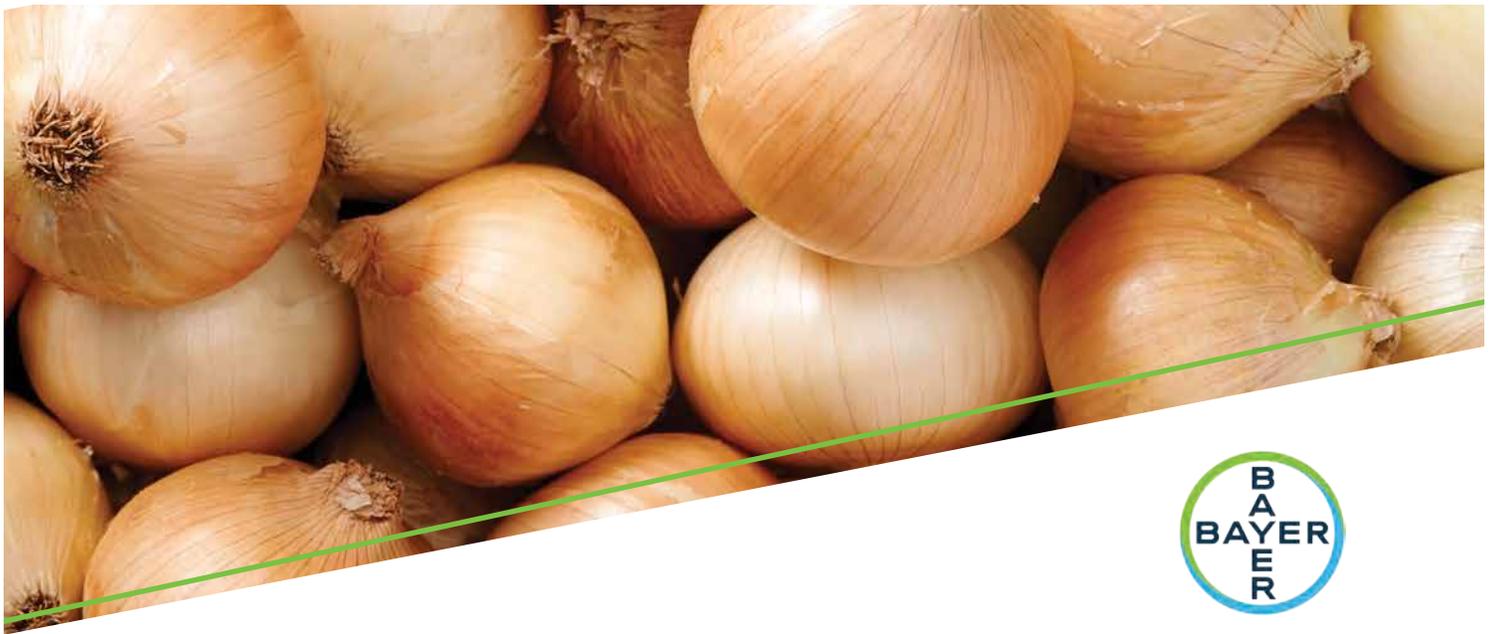
66 CAPCA Online CE

68 Job Opportunities

70 Chapter Events

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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Editor's Notes

New CAPCA Bylaws Provide Clarity

The CAPCA Bylaws were reviewed for the first time in nearly 20 years on Monday, October 16th at the 2023 CAPCA Conference & Agri-Expo. With the support of a special Bylaws Committee, the CAPCA Executive Committee and Board reviewed and offered up amended and restated bylaws to the CAPCA Membership. I want to personally acknowledge the work of Committee Chair Mike Huffman of the special Bylaws Committee. Huffman provided his experience in bylaws review to lead this process.

A quorum of members voted to immediately adopt the bylaws, providing CAPCA with clarity and a clear vision for member support in 2024. Some highlights include:

- CAPCA Board Governance: creating limited flexibility in the Board of Directors quorum when there are unseated chapter directors.
- Inactive Chapters have flexibility to dissolve, combine, or re-instate as needed.
- Brought clarity to the role of retiring Pest Control Advisers (PCAs) who are seated to the Board of Directors or Chapter leadership. Anyone who is elected while their license is active may remain in their seated position through their term even if their license has expired while they are currently serving.

As we look ahead to 2024 and the celebration of CAPCA's 50th Annual Conference & Agri-Expo, please remember: **CAPCA was formed to serve you, the member.** CAPCA is a volunteer-led organization with the program decisions and priorities coming forward from the Board, Committees, and Chapter leadership. *We hope that these updates bring better clarity to your role as a member, volunteer, and PCA.* If you are inspired to do more to serve your industry and the success of your license – I would challenge you to consider attending a chapter meeting or joining a committee meeting. There are several engagement opportunities to experience the interworking's and decision making of CAPCA.



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Leadership

Looking back at an eventful 2023



Paul W. Crout, CAPCA Chairman

This year, CAPCA has taken significant steps to address the changing landscape of regulations, licensure, and continuing education. With an unwavering commitment to its members and the pest control industry, CAPCA developed a comprehensive solution (CE Hours Reported) to track, validate, and report CE hours, ensuring compliance with the new certification and training (C&T) regulations set to take effect in 2024. In this article, we'll delve into the various initiatives and accomplishments that CAPCA has achieved in preparation for the upcoming regulatory changes.

Reinstating 30 Minutes of CE for Exhibit Hall, Q&A, and Panel Presentations

One of CAPCA's notable achievements was its successful advocacy for the reinstatement of 30 minutes of CE credit for Exhibit Hall, Q&A sessions, and panel presentations in the final version of the California Department of Pesticide Regulation's (DPR) C&T regulation changes. This change acknowledges the value of interactive and informative sessions as part of our CE, benefiting industry professionals and the broader community alike.

Securing a \$1 Million Grant for the Industry

CAPCA's significant accomplishment in securing a \$1 million grant from the California Department of Food and Agriculture is a testament to its dedication to the industry. The goal of this grant is to document and quantify all the work that PCAs do prior to making pesticide recommendations. More than \$500,000 of this grant will directly benefit professionals within the field in the form of stipends for PCAs and growers who participate in the pilot program.

Addressing Exam Issues and Temporary Exam Sites

To support Qualified Applicators (QALs) and Qualified Applicators Certificates (QACs) in complying with the new fumigant exams before January 1, 2024, CAPCA actively engaged with the DPR in discussions surrounding ongoing exam issues. As a result, temporary exam sites were secured, providing convenient access for individuals seeking to meet these new examination requirements. CAPCA's proactive approach ensured that the needs of licensed professionals were heard and recognized by the DPR Licensing Branch.

Free CE Content for Members

As an opportunity to create more value for our membership, CAPCA gifted all its members with 4.5 hours of FREE CE content in 2023, a value of \$90. This initiative not only underscored CAPCA's commitment to its members' professional development, but also eased the transition into the 2024 regulatory changes by providing additional opportunities for individuals to meet their CE requirements.

Enhanced Communication Initiatives

On the communication front, CAPCA launched several initiatives to better serve its members. The introduction of the CAPCA newsletter, website updates, a redesigned Adviser, and a new podcast all serve as vital informational tools. These platforms facilitated the dissemination of crucial information in various formats, enabling members to stay informed about industry developments and regulatory changes.

Chapter Advocacy Leadership (CAL) Program

The Ventura and San Diego chapters of CAPCA initiated the pilot for the CAL program. The goal of this program was to implement strategic outreach to decision-makers within various districts. The successes

achieved by these chapters will serve as a model for a statewide CAL program set to launch in 2024. This strategic advocacy effort aims to further strengthen CAPCA's influence and presence with our elected leadership.

In conclusion, CAPCA's proactive approach to addressing the CE hours changes for licenses with CE Hours Reported, alongside the other notable achievements, underscores its commitment to the pest control industry and its members. With a comprehensive solution in place, CAPCA can ensure that professionals are able to easily track, validate, and report CE hours to remain compliant with the roll out of the new C&T regulations in January. CAPCA staff and your volunteer leadership remain dedicated to ensuring that our members' interests are represented at the highest levels of government and that solutions are found for the challenges facing our industry. ■

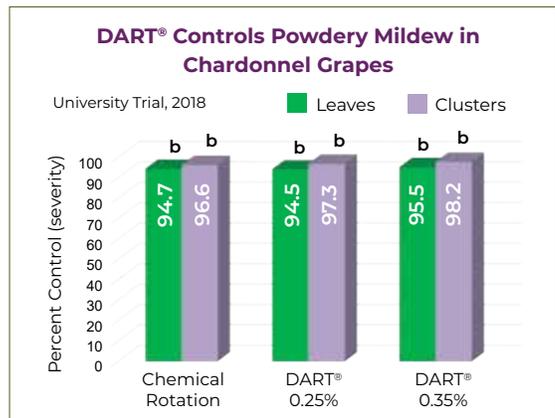


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Conference Recap



Annual CAPCA Conference & Agri-Expo



as credits for Certified Crop Advisers (CCA) and other state-specific requirements. Attendees delved into label updates, exhibitor presentations, educational panels, and informative science-driven updates that will prove invaluable in their professional journeys.

A Showcase of Cutting-Edge Solutions

Members had the opportunity to explore 140 exhibitor booths, which featured the latest technology, innovations, tools, and companies driving change in the industry. This hands-on experience allowed attendees to interact with and learn about the groundbreaking solutions shaping the future of pest management.

Notable Presentations and Discussions

The event featured a standout Technology Roundtable that delved into Innovation in Recordkeeping, Food Safety, and Pest & Disease Detection. It provided a platform for experts to discuss the cutting-edge technology and techniques transforming the industry.

CAPCA's state lobbyist, Taylor Roschen of Kahn, Soares, & Conway LLP, hosted a Sustainable Pest Management Roadmap Discussion with DPR Director Julie Henderson and California Department of Food and Agriculture (CDFA) Undersecretary Christine Birdsong, which addressed critical topics shaping the future of pest management.

More than 1,200 Pest Control Advisers (PCAs) from across California gathered at the Grand Sierra Resort in Reno, Nevada, from October 15-17, 2023, for the California Association of Pest Control Advisers' (CAPCA) 49th Annual Conference & Agri-Expo. This year's conference was all about embracing agricultural technology and its role in steering the industry into a promising future. As the dust settles on this remarkable event, it's evident that it was a resounding success.

Innovative Education and Enriching Sessions

The conference offered an extensive agenda that included 15.0 hours of Department of Pesticide Regulation (DPR) continuing education credits, as well

A Significant Grant and Honors

A major highlight occurred on Monday, October 16th, when the CDFA's Office of Pesticide Consultation & Analysis announced that CAPCA has been awarded a \$1 million grant for Sustainable Pest Management (SPM) in 2024. This grant will focus on comprehensive data collection to better understand the decision-making process of 200 PCAs and their use of Integrated Pest Management (IPM) and SPM in the field.

At the Member Luncheon, CAPCA recognized exceptional individuals for their contributions. Frank Miranda of the Desert Valleys Chapter received the Contribution to Agriculture Award for his dedication and passion for the industry. Krista Tavares of the Fresno Madera Chapter was named Member of the Year for her influential work with student-focused initiatives under the SWS Trust. For more information on these award winners, please see pages 18-19.



L-R: CAPCA 2023 Member of the Year Krista Tavares, Executive Board Secretary Adam Tavares, Executive Board Treasurer Jennifer De Jong, Executive Board Vice Chair Matt Bristow, Executive Board Chair Paul Crout, Executive Board Ex Officio Rick Harrison, and CAPCA's Outstanding Contribution to Agriculture Award winner Frank Miranda.



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Looking Ahead to a Milestone Year

"The 2023 CAPCA Conference was a success," said Ruthann Anderson, President and CEO of CAPCA. "From exciting panels, announcements, awards, and networking, this year's Conference provided our members with the tools and connections they need to stay informed and on the cutting edge of the industry."

CAPCA is looking forward to 2024 and celebrating 50 years of the CAPCA Conference and Agri-Expo. Please join us at Disneyland for the 50th Annual Conference & Agri-Expo on October 13-15, 2024.

CAPCA remains dedicated to being the leader in the evolution of the pest management industry through the communication of reliable information. With an eye on the future and the continued progress of the industry, CAPCA's Annual Conference & Agri-Expo serves as a vital hub for education, networking, and shaping the future of pest management.

CAPCA's 49th Annual Conference & Agri-Expo was indeed a significant milestone, and the 50th promises to be even more extraordinary. The future is bright, and CAPCA is at the forefront of driving innovation and excellence in the pest management industry. ■





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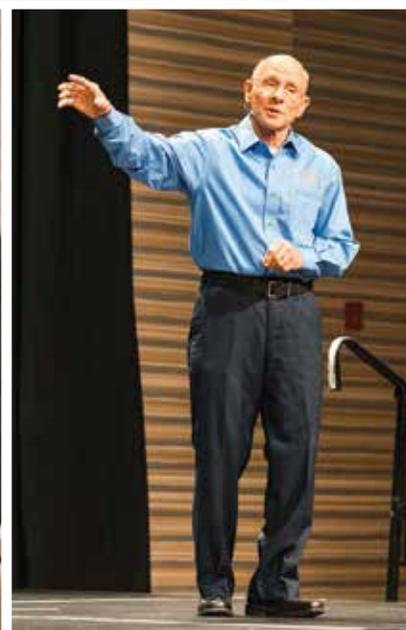


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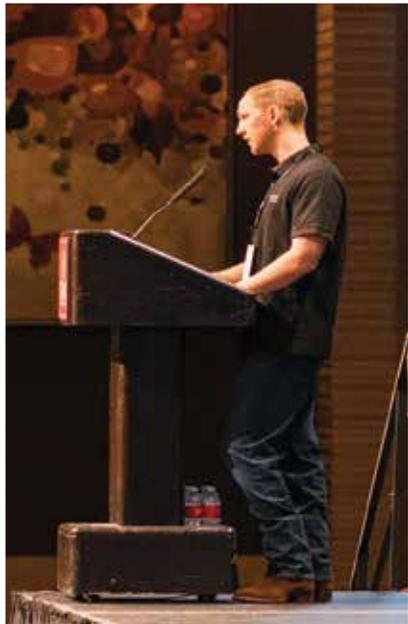
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2023 CAPCA CONFERENCE RECAP



49th ANNUAL CAPCA CONFERENCE & AGRI-EXPO



2023 CAPCA CONFERENCE RECAP



49th ANNUAL CAPCA CONFERENCE & AGRI-EXPO

Corteva Agriscience

Raises \$1,785 for the Stanley W. Strew Trust at CAPCA Conference



Corteva Agriscience demonstrated its commitment to pest management education at the 49th Annual CAPCA Conference. The company raised an impressive \$1,785 for the Stanley W. Strew Trust.

The Stanley W. Strew Trust benefits students pursuing careers in pest management. At the conference's Student Network Event, where students connect with industry professionals, Corteva Agriscience's efforts contributed to the Trust's mission of advancing education and outreach in the pest management field. This financial support will continue to inspire and educate the next generation of PCAs, ensuring a strong future for California's agricultural and landscape industries.





Annual CAPCA
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2023 Annual Awards



2023 CAPCA MEMBER OF THE YEAR AWARD

Krista Tavares

CAPCA's Member of the Year is an annual award bestowed upon a member and licensed PCA who excels in their contribution to the profession through CAPCA activities and leadership, above and beyond the norm. The 2023 recipient of the CAPCA Member of the Year Award is Krista Tavares.

Nominated by the Central Valley and Fresno-Madera Chapters, Krista has worked in the pest management industry for more than 15 years. Krista is currently the Technical Sales Representative for the Fresno Territory of Syngenta. Krista embodies what it is to be a CAPCA leader through her actions in her local chapters, involvement with students and new PCAs, and knowledge of the industry at a high level.

Both chapters nominated Krista separately, stating that she is the driving force behind their chapter's success and participation. Some of the highlights of her involvement include co-chairing the Student Network Event at the CAPCA Conference, organizing networking activities for PCAs, and coordinating continuing education events.

Outside of her CAPCA activities, Krista attends the FFA Ag teacher conference to promote PCAs, Ag in the classroom, develop curriculum, and entice teachers to teach a segment on pest management. Krista has also spearheaded a quarterly gathering for female PCAs to network and support other women in the industry.

Krista's actions, from chapter responsibilities to paving the way for the next generation through her work on the Student Networking Event and as a Stanley W. Strew Trustee, make her most deserving of recognition for her volunteerism and leadership as the 2023 CAPCA Member of the Year.

OUTSTANDING CONTRIBUTION TO AGRICULTURE AWARD

Frank Miranda

CAPCA's Outstanding Contribution to Agriculture Award is given to those individuals, companies or organizations that have made a meaningful difference in support of California agriculture. The 2023 recipient of the Outstanding Contribution to Agriculture Award is Frank Miranda.

Nominated by the Desert Valleys Chapter, Frank has worked in the pest management industry for 48 years. Frank currently works for Alamo Ricer Agronomy, LLC as an Agronomy Consultant, grower, and Pest Control Adviser for a diverse spectrum of vegetables, forage, fiber, hay, cereals, and seed crops.

Frank was one of the earlier cohorts, nearly 50 years ago, to obtain a PCA license. Frank's contributions to the field are numerous and span his decades-long career in pest management. His diverse experience in the industry – from in-house PCA, to manager of Rockwood Chemical Co., and even research and development within Gowan Company – has contributed to his status as an expert in the field.

Frank is widely known for his dedication to agricultural education, outreach, and advocacy at the local and state levels. Within CAPCA, he served as the Desert Valleys Chapter President, State Director, and Treasurer. Through his participation in Rotary, he hopes to continue educating people about farming and the important role that PCAs play in our food security.

Frank demonstrates a sincerity and passion for the work that he performs. He understands the tremendous responsibility that comes with being a PCA, and his reputation for integrity precedes him. He is always striving to give back to the industry and continuously leads by example in the PCA profession, serving as the model for countless individuals around and behind him. Therefore, it is with much honor, gratitude, and respect that CAPCA recognizes Frank Miranda as our 2023 Outstanding Contribution to Agriculture Award recipient. ■



1st Annual Chapter Awards

On Saturday, October 14, 2023, the CAPCA state office played host to the inaugural Chapter Awards ceremony in Reno, Nevada. This event featured an elegantly catered dinner, with a pre-event reception designed to provide a platform for Chapter leaders to publicly acknowledge and honor individual CAPCA members for their notable contributions.

In attendance were CAPCA staff and Executive Chair Paul Crout, who shared insights on the significance of volunteerism and the invaluable role that members play within the industry. The highlight of the evening was the presentation of meticulously crafted glass awards, bestowed upon the chosen recipients by Chapter leaders. Each Chapter leader had the privilege of sharing a few minutes with the audience, outlining the recipient's remarkable contributions to the organization and their specific Chapter.

The evening concluded on a high note, leaving attendees and award recipients eagerly anticipating next year's ceremony.

Award Winners:

Victoria Clark – Member of the Year. Desert Valley Chapter. Award presented by Bryan McCleery.

Darren Jones – Volunteer of the Year. Central Valley Chapter. Award presented by Jennifer De Jong.

Rick Foell - Chapter Cheerleader - Central Valley Chapter. Award presented by Jennifer De Jong.

Mike Lombardi – Veteran of the Year. Central Coast Chapter. Award presented by Danilu Jelderks.

Erin McAbee – Rookie of the Year. Central Coast Chapter. Award presented by Danilu Jelderks.



Chapter of the Year Award

CAPCA is proud to announce that the Chapter of the Year Award was given to the Central Valley Chapter. The award is based on a point system in which chapters across the state utilize their various activities and business to earn points at the state level.

The Central Valley Chapter has shown remarkable diligence in pursuing all point opportunities possible. They found numerous ways to engage in local advocacy opportunities in their region, including meetings with three local ag commissioners where they discussed upcoming regulatory changes. The chapter also committed to sponsoring six student attendees to the CAPCA Conference & Agri-Expo where they attended the Student Networking Event. In addition, the chapter hosted five continuing education meetings, volunteered their time at CAPCA state events, and maintained a consistent level of communication with CAPCA staff throughout the year to ensure that everything was up to date.

Thank you to all chapters who participated and made their own milestone achievements. Some of those included sending students to the Student Networking Event for the first time, participating in advocacy opportunities at new and exciting levels, and continuing to build engagement with local and new PCAs in the community. Your hard work and dedication to the industry and association did not go unnoticed. We look forward to seeing what 2024 holds.

If you have any questions about the Chapter of the Year Awards or how to maximize your efforts please contact Briana Love, briana@capca.com. ■



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The Endangered Species Act (ESA) brings a regulatory revolution

Part 1: A "Mega Suit" Takes the US EPA Over a Precipice

by Patrick Dosier, CAPCA Innovation & Technology Director

For PCAs and pesticide industry professionals, navigating a rapidly evolving regulatory environment is paramount for continued prosperity. This first installment of a four-part series explains the legal and regulatory journey leading to the present-day scenario where the US Environmental Protection Agency (US EPA) is set to implement drastic and disruptive new regulations.

For several decades, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) has been the cornerstone for pesticide regulations under the US EPA. This framework historically has facilitated the registration, sale, and usage of pesticides, ensuring both agricultural productivity and environmental safety. Many, including myself, argue that from now on, the Endangered Species Act (ESA) will have an equivalent, or even greater, impact on the registration and usage of pesticides.

A "Mega Suit" Marks a Turning Point

2011 marked the beginning of a critical juncture in environmental litigation. The Center for Biological Diversity and the Pesticide Action Network initiated a monumental case against the US EPA, alleging violations of the ESA, particularly concerning the registration of numerous pesticide active ingredients.^{1,2,3,4} The lawsuit alleged that the US EPA did not uphold its obligation to the ESA during the past decades, questioned the current rules and processes, and identified more than 300 pesticide active ingredient registrations as potentially invalid.

In 2023, the US Department of Justice, representing the US EPA, finally reached a decisive resolution to this longstanding litigation. This settlement commits the US EPA to a suite of proposed reforms aimed at better

protecting endangered species from pesticides, marking a significant shift in the regulatory landscape.^{5,6,7} If the US EPA fails to rapidly implement regulations to uphold its ESA obligations, the pesticides listed in this suit (more than 1,000 labeled products) risk cancellation.

Given the circumstances and the finality of the settlement, my advice to industry professionals is to accept this outcome and prepare for the changes. This has been adjudicated. The defendant in the case was the US EPA, and they settled. The case won't be appealed. It won't be sent to a higher court.

The Imminent Changes

The US EPA's 2022 ESA Workplan Update, released in November 2022, outlines the steps the agency will take to better protect non-target species, including endangered ones, during pesticide registration review and other FIFRA actions. The workplan introduces a new era of proactive measures toward environmental and species protection.^{6,8} As a result, growers will be required to implement multiple "mitigations" to use pesticides in many areas. The next article in this series will dive into what the US EPA's Workplan mitigations entail and what you and your growers will need to do to comply.

Central to this Regulatory Metamorphosis: The Precautionary Principle

The introduction of the Precautionary Principle into US policy signifies a monumental shift in the approach of agencies like the US EPA. The Precautionary Principle, which advocates for erring on the side of caution in policy making, especially when uncertainty about potential irreversible harm to the environment or human health is at stake, has found its way into the US

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regulatory framework. This principle is deeply ingrained in European Union (EU) policymaking. Its adoption signifies a key change in the US regulatory approach, impacting how agencies handle environmental and human health protections.^{9,10,11,12} Pesticide registrants may find themselves in the unenviable position of having to virtually eliminate the uncertainty around the environmental and health side effects of new compounds. They will have to *prove a negative* when they register new products. They will have to provide evidence that their active ingredient will not harm any one of the thousands of listed endangered species.

These Changes are Coming Fast

It's crucial for PCAs to understand that these regulatory shifts are not only certain but also are arriving swiftly. With the release of the 2022 ESA Workplan, major changes are on the not-so-distant horizon. The US EPA's first phase rollout, called the Herbicide Strategy (detailed in the next article in this series), is slated for implementation as early as Q3 2024. The US EPA's new focus on proactive protection measures, colloquially referred to as "mitigations," embodies an aspiration for collaborative and flexible development, seeking extensive stakeholder participation.

While these changes aim to protect the environment, they don't guarantee higher earnings for PCAs. Instead, they present more hurdles in daily operations, necessitating a keen understanding and adherence to the newly introduced regulations, painstaking documentation, and frustrating interactions with a poorly designed US EPA website. While growers will ultimately

be liable for meeting the US EPA regulations, we know that most growers will rely heavily on well-informed PCAs to guide them in compliance.

Upcoming Articles

Even when briefly summarized, the extent and complexity of the ESA's impacts are too much for one article in *The Adviser*. I believe it's important to first digest this information; then PCAs can begin the process of understanding what comes next. In Part 2 of this series, I will introduce the mechanics of the US EPA's 2022 ESA Workplan, detailing the mitigation measures, the points system, and implications for the industry. I also will point out how these mitigations are, as currently defined, too narrowly focused on broad acre crops to the detriment of specialty crop growers in the arid west. Part 3 will explore alternative strategies to the Workplan mitigation, offering insights into potential avenues for widespread compliance through regional conservation agreements. And finally, Part 4 will be more conceptual; our industry needs to find ways to monetize the environmental benefits of our practices. Crops grown in the US, especially in California, are the safest in the world. They must, somehow, become a trusted brand that garners a premium in the marketplace.

This emerging regulatory paradigm underscores the imperative for PCAs and industry professionals to rapidly adapt to the new compliance mandates, ensuring both biodiversity and operational viability. Stay informed and prepare for these changes. Look out for the next installment in *The Adviser* for a deeper dive into this topic. ■



Photo: J. McNutt

Works cited as background:

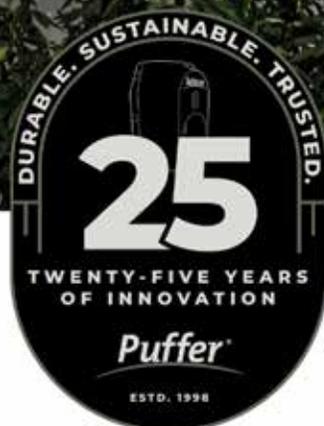
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Fasten Your Seatbelts, it's Election Time Again!

by Josh Walters

You may not feel like you're ready for the constant media coverage, commercials, and colorful lawn signs that election season brings to California every two years. But buckle up, because that time is upon us.

Now, you may be asking, "Wait, didn't we just finish with the last election? Has it really been two years?" The answer is yes, kind of. A 2017 law moved California's primary election, during presidential election years, to March. This means there are only 16 months between the November 8, 2022, general election and the March 5, 2024, primary election. Ballots will be mailed to voters by February 5, 2024.

This change was intended to make California more relevant in the selection of each party's presidential nominee by making us among the first handful of states weighing in on the presidential primary. Prior to 2017, typically enough states had voted by the time California held its primary in June that presidential nominees already had been decided. To some extent, the change has worked.

The proof lies in the fact that Republican presidential hopefuls already are visiting the Golden State and using their precious resources to purchase commercials in hopes of convincing party activists, donors, and voters that they can beat President Biden next November. In fact, the September Republican debate took place at the Ronald Reagan Presidential Library in Simi Valley.

That said, national polls indicate that the top of the ticket is likely to be a rematch of the 2020 election – so, let's move on to something more novel – at least if you are a political junkie like me!

State Legislative Races Matter, and Now is the Time to Act

Those of you who have read my column before know how important I believe the State Legislature is to your businesses and to California agriculture as a whole. In 2023, the Legislature introduced more than 2,600 new bills, about 890 of which ultimately were signed into law. Each one represents an opportunity to impact your industry in some way. That's why electing smart, reasonable, and accessible representatives who are open to understanding the challenges and opportunities facing your industry is of the utmost importance.

The 2024 cycle represents the best chance to do that (at least until we get new legislative lines in 2032). Nearly 25 percent of the 120 legislative seats (80 Assembly, 40 Senate) are up for grabs this cycle. Coupled with the 30 percent of seats that turned over in the 2022 cycle, more than half the Legislature will be full of new faces who are likely to stay in their seats for up to 12 years. This means that most legislators are likely to be locked in place until 2034 – 2036.

So, it's time to get engaged. Not doing so, a.k.a. "the ostrich approach," means ten-plus years of being on the outside looking in. Does that mean trying to flip the Legislature's party balance? No – this is California, after all. But it does mean we have an opportunity to elect moderate Democrats who are thoughtful and willing to stand against the onslaught of laws that are coming from the Legislature's most progressive wing.

The last day for candidates to officially file to have their names appear on the ballot is December 8, 2023. So, we won't know exactly who is running for what office until then. But we have a pretty good idea. At the time of this writing (in late October), it looks like there will be 17

State Assembly seats and 11 State Senate seats “open,” which means they are up for grabs. These vacancies are due to term limits or incumbents vacating their seats to seek higher office.

Outside of the “open” seats, we also are tracking several seats where incumbents are likely to face competitive challenges. There are between two and four Assembly Republicans, and one Senate Republican, who could see particularly competitive elections. This could be especially true for Republicans who were elected by slim margins in swing districts during the last mid-term elections.

Republicans often fare better in mid-term elections, where the electorate tends to be smaller, more informed, and more partisan compared to voters in a presidential year where more occasional voters favor Democrats. These dynamics could spell trouble for at least two Republican incumbents – and it's something that we are watching very closely to judge if there is an opportunity to engage.

Don't Forget About Propositions

California's direct democracy system also puts a hodge-podge of public policy questions directly to the voters, and the 2024 election is no exception. As of the time of this writing, nine ballot measures are poised to be on the November ballot, with just one measure on the March ballot. There are also several potential measures that are still gathering signatures, and if they are successful, these numbers could increase.

California law allows for ballot measure proponents to withdraw their measure if a legislative solution is reached prior to the election, so some of these measures may fall off. The deadline for those decisions is in June 2024, so we won't have an official list of ballot measures until then.

But for now, here is a list of measures you should expect to see:

March Primary

- Proposition 1 – \$6.38 billion bond measure to fund behavioral health treatment beds throughout the state.

November General

- Constitutional Amendment in Support of Marriage Equality
- Repealing Constitutional Article 34, Requiring Voter Approval of Public Housing Projects
- Establishing 55 Percent Vote Threshold for Local Affordable Housing and Public Infrastructure Projects
- Referendum on Oil and Gas Setbacks Near Residential Communities
- Pandemic Early Detection and Prevention Act
- Fair Pay and Employer Accountability Act (PAGA Reform)
- \$18/Hour Minimum Wage
- Taxpayer Protection and Governmental Accountability Act (Raises threshold for voter approval of certain taxes)
- Justice for Renters Act (Rent Control)

Looking Ahead

I look forward to keeping CAPCA members apprised as the 2024 election takes shape. As always, if you have questions in the meantime, never hesitate to reach out. You can reach me anytime at josh@jcwaltersesq.com. ■



DPR wants to learn from PCAs

by Brad Hooker, Agri-Pulse

As the Newsom administration builds out its “sustainable pest management” (SPM) agenda, the California Department of Food and Agriculture (CDFA) and the Department of Pesticide Regulation (DPR) are hoping to learn more about the practices already in place that fit the criteria.

The CDFA has awarded a \$1 million grant to CAPCA for a two-year study on existing management practices. The project will provide data to inform SPM development, as well as to produce new educational courses for PCAs.

“PCAs are our boots-on-the-ground partners and have first-hand experience with the multitude of pressures that our producers face every day,” said CDFA Undersecretary Christine Birdsong in a statement on the grant. “The information they will gather through this pilot study will provide a clear analysis of the pests our producers are addressing. This information is essential for understanding the current state of pest management and the impacts of any future changes.”

Participating PCAs will receive stipends in exchange for consistently reporting detailed information on strategies like pest surveillance, plant health diagnostics and recommendations for pesticide applications. The subsequent continuing education curriculum will focus on filling gaps in SPM training.

During CAPCA’s annual conference in October, Birdsong and DPR Director Julie Henderson were eager to more closely coordinate and collaborate with PCAs so that the advisors have the necessary tools at hand for making recommendations consistent with SPM.

“Our current system for providing CE credit is really focused on pesticide management and safety and not so much integrated pest management,” said Henderson. “That’s something that we’re going to have to look at adjusting, and we’ll need your input.”

Henderson added that PCAs are “the ones who can really encourage and stimulate the change on the ground that we’re looking to see.” She hopes the study will serve as a catalyst for opening up a broader dialogue to gather ideas from PCAs on SPM implementation and that it would in turn serve as “a great selling point” for PCAs and California agriculture in the marketplace.

“While IPM is practiced very widely, it’s not documented in any consistent, formal way,” she said. “That leaves us with a lack of data.”

Birdsong added that the study would help with educating Californians, as well, since “the public really has no idea about what goes into pest management on a farm.”

“There’s this unfortunate concept that farmers are outside with a hose spraying everything willy-nilly with chemicals,” she said. “We know that’s not true.”

Birdsong explained that the pilot program seeks to capture the decisions that happen before PCAs get to the chemical recommendation, such as considering softer chemistries or other alternatives. That information will set a baseline for what is already happening out in the fields and help the agencies determine progress as more SPM practices are adopted.

“These are all things that we lose in the pesticide use report, but they’re vital,” she said. “It’s so important to move forward with SPM.”

Birdsong assured PCAs that any additional reporting cannot add to the overall compliance burden.

“We want to make it easy for you, but to capture as much information as we can,” she said.

For more news, go to [Agri-Pulse.com](https://www.agripulse.com). For more information on the grant, see “*CAPCA Members Awarded \$1 Million CDFA Grant*” on page 56. ■



TIMELY FUMIGATION TO DEVELOP A STRONG SOIL FOUNDATION

Suppress pests and boost yields with K-Pam® HL™

A plentiful crop is dependent upon a strong soil foundation. Factors such as fertilizer and a pest-free environment improve growth potential. For California growers producing tomatoes—one of the state’s top commodities—ensuring optimal soil conditions is a high priority. Soil fumigation is a time-tested and proven practice that reduces harmful pathogens, pests and weeds in the soil to grow a successful crop.

CURRENT THREATS FOR TOMATOES

Growers in California face a number of threats when it comes to these high-value crops.

Verticillium – a disease triggered by cool weather with symptoms beginning within 45 days of planting. Once established, it persists indefinitely and can affect new transplants

Fusarium – can result in crown/root rot, foot rot, and wilt. Lesions can be extensive, resulting in a slow decline in plant health and ultimately plant death

Nightshade – can harbor diseases and pests that further damage tomato crops

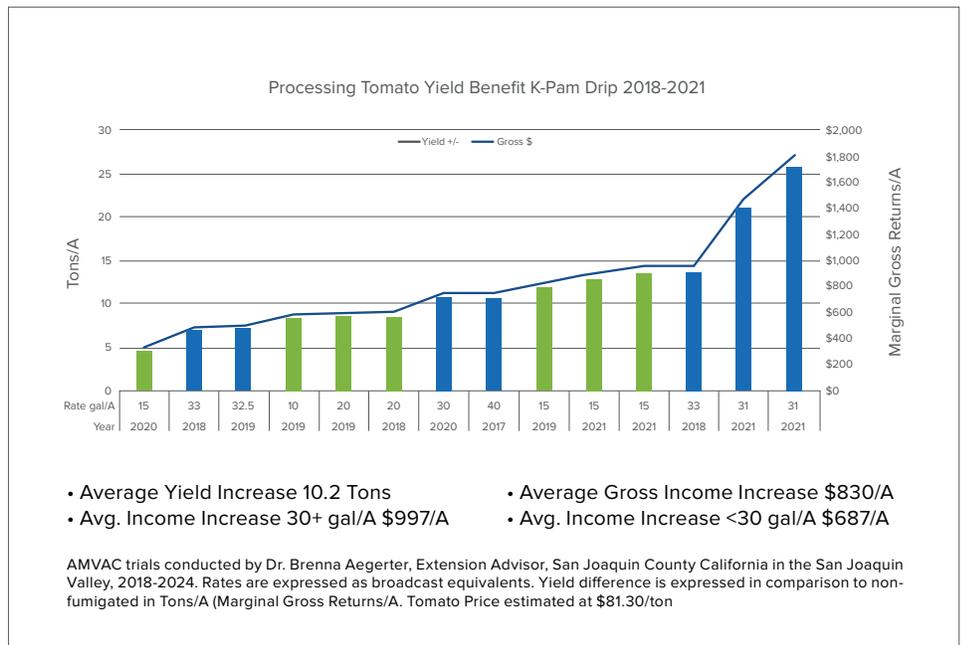
Nutsedge – a hardy weed that has the capability to grow through the plastic in strawberry rows and easily spread from field to field

Nematodes – damage tomato crops by creating galls on roots that interfere with the flow of water and nutrients

FIGHT PESTS WITH SOIL FUMIGANTS

AMVAC’s industry-leading, time-tested metam product K-Pam® HL™ helps growers develop a strong soil foundation and provide control or suppression of weeds, diseases, and nematodes ahead of planting.

Metam breaks down into simple fertilizers that are available to the crop. While both disease and bacteria are reduced through fumigation, beneficial organisms rapidly repopulate after fumigation with dead fungi serving as a terrific source of food for a bacterial rebound.



K-Pam HL contains metam potassium, which is optimized for:

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- When a K2O fertilizer is needed

K-Pam HL is registered for use on multiple crops, consistently producing higher yields and quality. It is compatible with a wide variety of soil types and application methods. AMVAC also enables growers to safely reap the benefits of effective soil fumigation through training and stewardship practices.

Reach out to your AMVAC representative today to learn more about K-Pam® HL™ .

CA DPR Electronic Mailing List Subscriptions



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 - Cannabis
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- **Pesticide Registration and Evaluation**
 - Materials Entering Evaluation Process
 - Pesticide Reg. and Eval. Committee (PREC)
- **Pesticide Use Reports**
 - Pesticide Use Reporting (PUR) Analysis Workgroup
- **Regulatory Notices**
 - Notice of Proposed and Final Decisions
 - Notices to Stakeholders
- **Statewide Notification System**
 - Pesticide Notification Network
- **Human Health Mitigation**
- **Rulemaking**
 - Notices of Proposed Regulatory Action
- **Pesticide Safety**
 - Pesticide Safety - Train the Trainer Program



ACRC announces a new second contractor in California

The Ag Container Recycling Council (ACRC) is pleased announce that, effective immediately, ACRC has named a second contractor for ACRC collection and recycling service in the state of California. Ag Plastic Recycling, owned and operated by Geostan Duffin of Strathmore, California, will begin providing services in California starting in the fourth quarter of 2023. Geostan Duffin is also the owner of Duffin Orchard Services and has been providing tree topping services in the Central Valley since 2016. He has developed a strong reputation in the ag community and will be a great new asset to the ACRC program. Geostan can be reached at geostanduffin@gmail.com or 559-840-5379.

ACRC's existing contractor, Interstate Ag Plastics (Brad Bittleston), will continue to provide collection and recycling services in Arizona, California, and Nevada, just as they have for many years. However, Interstate Ag Plastics and Ag Plastic Recycling will cover the state of California with a shared model as follows:

- Interstate Ag Plastics will cover all California counties EXCEPT the following seven, which will be covered solely by Ag Plastic Recycling: *Colusa, Lake, Napa, Sonoma, Sutter, Yolo, and Yuba.*
- The following eighteen counties will be shared by Interstate Ag Plastics and Ag Plastic Recycling, but collection sites within these counties will be unique to each contractor: *Alameda, Contra Costa, Fresno, Kings, Madera, Marin, Merced, Monterey, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Solano, Stanislaus, and Tulare.*
- All counties not listed above will continue to be serviced solely by Interstate Ag Plastics.

ACRC is excited to have additional collection capacity in California and asks that you join us in welcoming Ag Plastic Recycling to the ACRC program. If you have any related questions, please don't hesitate to contact ACRC Executive Director, Mark Hudson, at mhudson@agrecycling.org. ■

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Implementing biological control for invasive brown marmorated stink bug in California

Ricky Lara¹, Jhalendra Rijal², Cindy Kron², Sudan Gyawaly², Vincent Maiquez¹, Daniel Roberts¹, Chang Vue², Mark S. Hoddle³

¹ California Department of Food and Agriculture; ² UC Cooperative Extension & Statewide IPM Program; ³ UC Riverside

Brown marmorated stink bug (BMSB), *Halyomorpha halys* (Hemiptera: Pentatomidae), is a polyphagous insect native to Asia. Invasive BMSB populations are well established in the eastern and western United States, where they cause feeding damage to specialty crops, including fruits, nuts, and vegetables. In California, BMSB is established in at least 16 counties extending from Southern California, through portions of the Central Valley, and reaching Siskiyou County along the border with Oregon (see page 44 of this issue for the latest distribution map). BMSB populations thrive in

urban hotspots where they encroach into commercial pear (Sacramento, Mendocino, and Lake counties), peach (Stanislaus and Merced counties), and almond orchards (San Joaquin, Stanislaus, Merced, and Fresno counties) during spring and summer (Fig. 1). Field implementation of sustainable pest management solutions targeting BMSB populations is in the early phase, but preliminary results are encouraging.

Since 2013, researchers with the California Department of Food and Agriculture (CDFA) and the University of California (UC) have

FIG. 1. BMSB adult recovered from an urban monitoring site (A) and a BMSB nymph observed feeding on developing almonds and generating hull gummosis in a California almond orchard (B). Photos: Vincent Maiquez.



been working together to deliver a science-based classical biological program for BMSB using its co-evolved egg parasitoid, samurai wasp, *Trissolcus japonicus* (Hymenoptera: Scelionidae) (Fig. 2). Host-specificity studies showing preference by the parasitoid for BMSB over non-target hosts were completed in 2018 at UC Riverside (Lara et al. 2019a). That same year, an adventive strain of samurai wasp, different from the strain being studied in quarantine, was discovered by UC Riverside researchers naturally parasitizing BMSB eggs

Thin Smarter, Not Harder

New Accede® Plant Growth Regulator Liquid Concentrate from Valent U.S.A. Delivers the First Commercially Viable Chemical Thinner for Peaches & Nectarines

It's a persistent challenge for peach and nectarine growers — finding qualified workers to hand thin orchards in a timely fashion. Each day that unwanted fruitlets remain on a tree, they steal vital carbohydrates and nutrients away from the final crop, ultimately impacting fruit quality and size.

“Growers have a tough time finding experienced labor,” says Jozsef Racsko, Valent U.S.A. PGR product development manager. “Usually, hand thinning takes place in late April and early May. Over the last few years, however, hand thinning has continued well into the middle of summer as growers align their crop load management goals.”

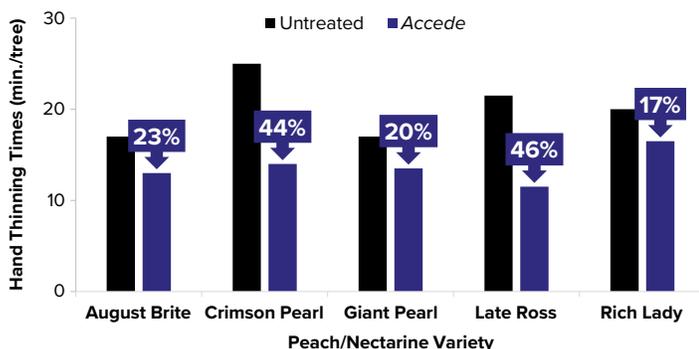
Beyond the negative effects delayed thinning has on crop quality and marketability, hand thinning expenses are rising with the increasing minimum wage. And the minimum wage in California has increased by 50% in the last five years. Cost can range from \$2,500 to \$4,000 per acre, Racsko says.

Reduce Thinning Costs

While mechanical thinning is available, it leads to other issues such as blossom and leaf damage. And chemical thinning hasn't been an option — until now. Accede® Plant Growth Regulator Liquid Concentrate is a first-of-its-kind chemical thinning solution for peaches and nectarines that enables growers to thin stone fruit earlier in the season, saving money and improving overall fruit quality.

Accede works by using a naturally occurring non-protein amino acid to stimulate the production of ethylene, which triggers seed abortion and activation of the abscission zone at the base of the fruit stem.

The result is a 15% to 30% reduction in fruit set, saving labor and shortening the time required to hand thin a tree by 30% or more.

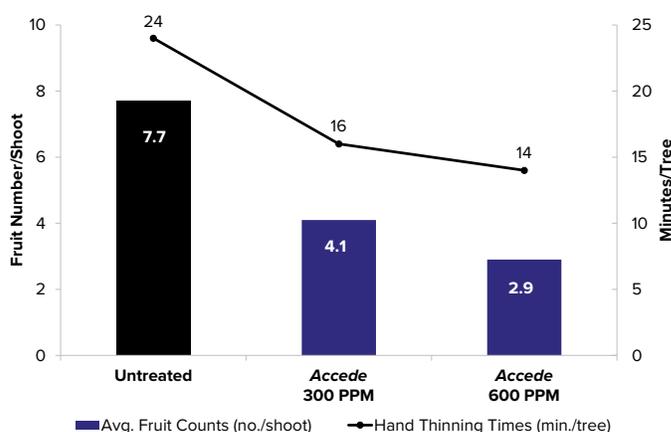


On average, Accede reduced the hand thinning time per tree by 30% over the untreated. Data are average values from multiple studies on peaches and nectarines in California.

Source: Valent U.S.A.

Improve Fruit Quality and Size

Applying Accede at bloom allows growers to tackle crop load management earlier in the growing season, removing fruitlets even sooner than timely hand thinning — this often results in a larger fruit size after an Accede application compared to hand thinning alone. Fruit may also mature earlier and more uniformly, allowing for earlier harvest and reduced number of picks. This is very important as harvest labor is a major cost category within the total peach/nectarine production cost.



An application of Accede during bloom reduced the number of fruit per shoot by 40% or more. Accede also reduced the hand thinning time per tree by 30% or more. Data are average values from multiple studies on peaches and nectarines in California.

Source: Valent U.S.A.

Application Timing

Accede can be applied from pink bud through petal fall. Racsko recommends targeting application between mid- to full-bloom for best results. It is important to avoid or delay applications when daily minimum temperatures are forecasted near freezing. Applications made at cold temperatures (below 36° F) may cause over-thinning.

Application Rates

Accede can be applied at 300-600 ppm rates. In most cases, 300-400 ppm rate provides sufficient thinning efficacy. “In our trials, we have seen varietal differences in response to Accede, so **it's best to apply a lower rate until a grower has a better understanding of how the product performs with any particular variety,**” Racsko says.

To learn more, talk to your PCA or visit Valent.com/Accede.



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in Southern California (Lara et al. 2019b). However, subsequent BMSB parasitoid field survey results show that samurai wasp is absent in Northern California. BMSB control is still needed due to the absence of effective resident natural enemies and the abundance of reproductive host plants that allow urban populations to persist perennially and spillover into commercial crops (Rijal and Duncan 2017; Kron 2020; Maiquez and Lara 2023). Consequently, in 2021, CDFA's Biological Control Program recovered and began rearing the adventive samurai wasp strain for redistribution (Maiquez and Lara 2022). The primary goal of these efforts has been establishing samurai wasp in BMSB-infested hotspots where the parasitoid is absent. Timely samurai wasp redistribution in urban and agricultural areas will optimize BMSB management efforts for specialty crops in California.

As of September 2023, the Biological Control Program reared and released more than 20,000 samurai wasps in BMSB infested hotspot areas throughout Northern California, including Sacramento, Santa Clara, Siskiyou, San Joaquin, and Yolo counties (Maiquez and Lara 2023). Known BMSB host plants in California urban areas include *Ailanthus altissima* (tree of

FIG. 2. Samurai wasps in plastic vial with honey being prepared for field release (A) and observed attacking BMSB sentinel egg (black arrow pointing to parasitoid laying an egg within the BMSB egg) on citrus (B) in Northern California. Photos: Vincent Maiquez (A) and Ricky Lara (B).

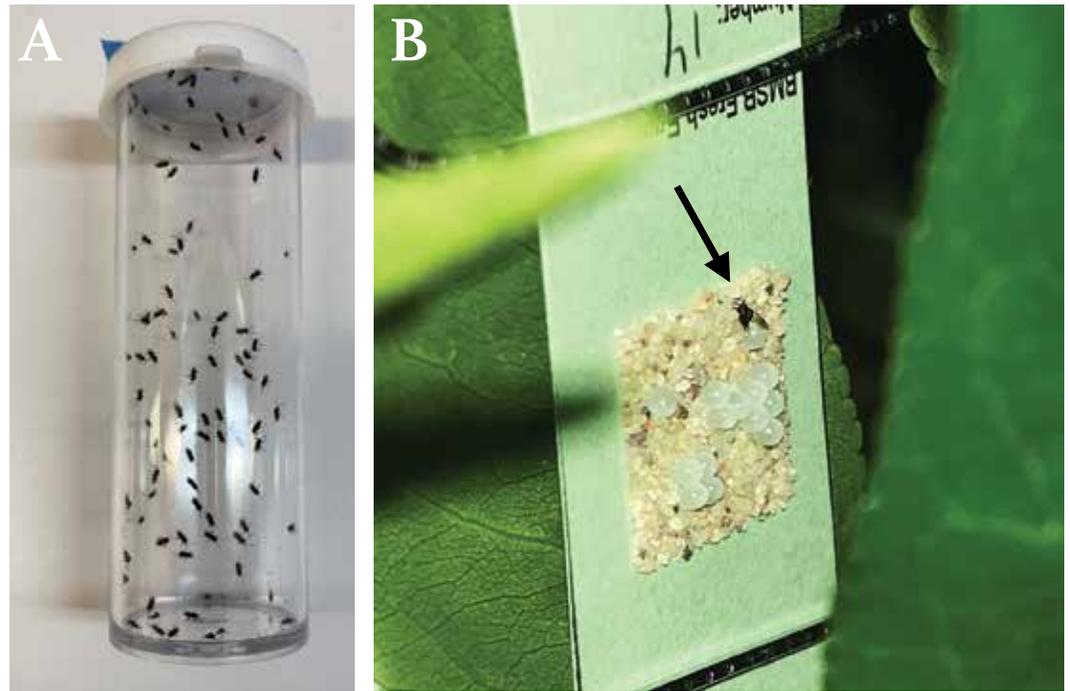


FIG. 3. Field release of lab-reared samurai wasp during summer 2022 in a BMSB-infested almond orchard in the San Joaquin Valley conducted by (left to right): Vincent Maiquez (CDFA), Jhalendra Rijal (UC Cooperative Extension), Ricky Lara (CDFA), and Chang Vue (UC Cooperative Extension). Photo: Vincent Maiquez.

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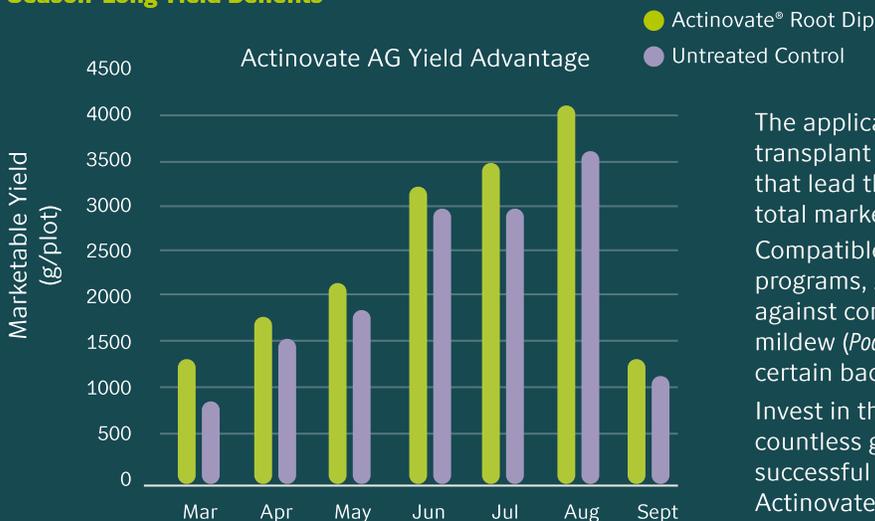
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heaven), *Pistacia chinensis* (Chinese pistache), *Catalpa* spp., *Fraxinus* spp. (ash), *Citrus* spp. (orange), *Prunus persica* (peach), and many others listed at StopBMSB.org. Collaboration efforts with Dr. Jhalendra Rijal (UC Cooperative Extension Area IPM Advisor), have helped identify almond production sites in the northern San Joaquin Valley impacted by BMSB populations that are prime targets for seasonal samurai wasp releases (Fig. 3). Pest pressure by BMSB on almonds has significantly increased since the first detection on this crop in 2017 (Rijal and Gyawaly 2018) and has been a source of economic damage in that area (Rijal et al. 2021). Pesticides have had limited efficacy with most being broad-spectrum, which are a concern for non-target impacts on natural enemies (Rijal 2022). Integration of biological control practices, like seasonal samurai wasp releases into the almond production system, is expected to reduce the need for prophylactic pesticide applications, generating cost-savings for growers.

Collaborative work with UC is still underway to measure the impact of samurai wasp releases on BMSB populations. Samurai wasp presence is being monitored seasonally during spring and summer months to document parasitoid establishment and spread in BMSB-infested habitats. Parasitoid post-release monitoring work is done through the deployment of cold-treated sentinel BMSB egg cards at both parasitoid release sites and non-release sites with known BMSB host plants (Fig. 4). BMSB eggs on cold-treated cards are unable to hatch and therefore are safe to deploy and can be used by samurai wasp to complete egg-adult development. During 2021-2023, >1,700 BMSB sentinel egg cards totaling >15,000 cold-treated BMSB sentinel eggs were deployed by CDFA and UC cooperators across BMSB-infested areas in southern California (Dr. Mark Hoddle), the northern San Joaquin Valley (Dr. Jhalendra Rijal and Dr. Sudan Gyawaly), and northern California (Dr. Cindy Kron). Recovered

FIG. 4. Examples of BMSB sentinel egg cards placement to monitor samurai wasp presence on a selection of BMSB host plants, including almond (A) and cherry (B) in agricultural and urban habitats, respectively. Photos: Vincent Maiquez (A) and Daniel Roberts (B).



Harness the strength of Kemin's Botanical oil-based biopesticides as early pest management tools to start the growing season



When it comes to safeguarding your fields from threatening pests like two-spotted spider mites, thrips, lygus, mealybugs, spotted wing drosophila, whiteflies, or navel orange worm, and combating the relentless attack of diseases like botrytis or powdery mildew, proactive measures are the secret to a thriving harvest season.

Our expertise in essential oils brings growers a range of cutting-edge solutions, including miticides-insecticides and repellents, all designed from our proprietary oil blends: TetraCURB™ MAX enriched with rosemary, peppermint and clove oil; AlliCURB™ MAX with the natural force of garlic oil and fungicide-bactericide PathoCURB™ with the potent thyme oil. These FIFRA 25(b) Exempt formulations effectively manage the most challenging pests and diseases and provide growers with safe (zero-hour REI), and convenient (zero-day PHI) tools to protect their high-value crops, when used as directed.

Michael Hull, Kemin Crop Technologies' Technical Services Manager, an entomologist deeply passionate about the potential of botanical oils in agriculture shares his invaluable insights and best practices with growers and PCAs, offering a roadmap to success when utilizing these groundbreaking biological products. In this article we are highlighting four key features of Kemin's botanical oil-based biopesticides growers and PCAs should know.

1 THEY PERFORM AT THEIR BEST WHEN USED AS PART OF A PREVENTATIVE SPRAY PROGRAM

Botanical oil-based products can have a greater initial knockdown due to their contact activity. However they have a low residency time in the field compared to conventional products. Therefore we recommend adopting a proactive strategy instead of a reactive one.

As such, spraying early and consistently at a lower rate helps prevent the populations from reaching the economic threshold. We suggest knowing the target pathogen's and pest's historical seasonal emergence and their life cycle to help timing the preventative sprays.

2 THEIR MULTIPLE MODES OF ACTION RESULT IN A LOWERED CHANCE OF PESTICIDE RESISTANCE DEVELOPMENT

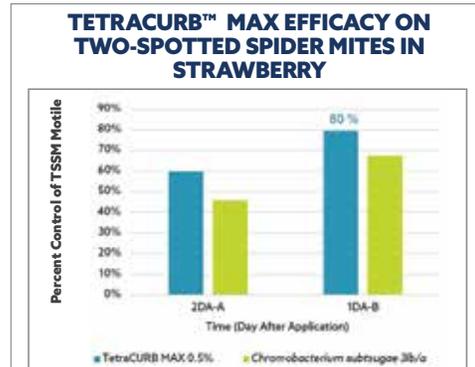
Insects and pathogens can develop resistance when products from the same chemical group are repeatedly used without rotation. Whereas botanical oil's active ingredients help reduce the likelihood of insects and pathogens developing resistance due to their natural sourcing and having varying chemical compositions. This gives growers different action modes to control insects and pathogens, sometimes even with one product. These products work well with conventional chemistries and help reduce the likelihood of resistance development when incorporated into an IPM program. Another added benefit of some botanicals is their repellency as a MoA. It enhances contact insecticides by deterring insect activity in applied acres. Spray applications need to be made often to maintain effective repellency.

"We recommend that growers include Kemin's botanical biopesticides into a tank mix with other chemistries or in rotation to add additional modes of action and potential synergistic effects to a program, leading to higher knockdowns of target pests and an increased likelihood of successful control." — Michael Hull, Technical Services Manager at Kemin Crop Technologies

3 THEY CAN BE JUST AS ECONOMICAL FOR GROWERS AS CONVENTIONALS WHEN USED CORRECTLY

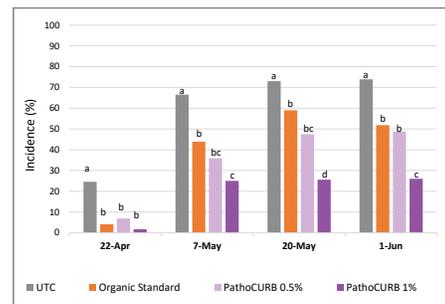
Higher rates are generally recommended for higher pressure when the pest population has grown to a point where a more aggressive spray is needed or for rescue. Therefore, keeping the population low throughout the season can help lower the application cost. The lower rate can be sprayed repeatedly on crops without risks of phytotoxicity and helps keep the disease or pest infestation at bay.

4 THEY HAVE DEMONSTRATED PERFORMANCE IN FIELDS



Field Trials in Arima, California - TetraCURB MAX suppressed the motile populations of the two-spotted spider mite by 80% after 2 applications at 0.5% rate. Kemin Source: SD-22-24664.

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Field Trial in Washington State Research Field, Wenatchee, Washington... PathoCURB showed an equivalent seasonal disease suppression to an organic standard program and statistically outperformed the standard at a higher rate. Kemin Source: SD-21-24444.

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sentinel cards were brought back to the lab to observe any parasitoid emergence, determine species, and document egg parasitism rates.

A subset of these field BMSB eggs showing evidence of parasitism were dissected to determine BMSB egg parasitism levels. Sentinel cards recovered from monitoring sites in Los Angeles, Lake, Mendocino, Siskiyou, Stanislaus, Merced, and Yolo counties were analyzed and compared between 2021 and 2022 for parasitism. Out of the 4,887 eggs recovered in 2021, prior to samurai wasp redistribution in California, 109 (approximately 2.2% of eggs deployed) showed either successful (emergence of adult parasitoids) or unsuccessful (undeveloped or unemerged adult parasitoids) parasitism. In 2022, the same 2021 sites were monitored and 542 of the 4,486 recovered eggs (approximately 12.1%) exhibited signs of parasitism, indicating an increase in egg parasitism. In 2023, four additional satellite monitoring sites were added proximal to each release site to track samurai wasp spread, totaling 1,233 sentinel egg cards (>11,000 eggs) deployed, which are currently being processed. Parasitoid species identification is still in progress to determine how much of this egg parasitism increase is attributable to samurai wasp.

Nevertheless, it is clear that a decade-long biological control research effort has provided a new natural enemy for BMSB management in California. Continued post-release monitoring work is expected to generate valuable information on samurai wasp release efficacy, its establishment and impacts, and natural dispersal rates. Once established in new areas, samurai wasp breeding populations are expected to become self-sustaining. Overall, we are hopeful that established parasitoid populations in urban and agricultural habitats can reduce nuisance problems in residential areas, minimize the threat posed by BMSB to specialty crop growers in California, and will promote sustainable pest management practices in agricultural systems. ■

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Because peptides have larger binding sites compared to traditional small-molecule synthetic chemicals, they are much more precise in targeting insect receptors, which promotes long-term agricultural sustainability. Honeybees are needed to cross pollinate over 85 percent of agricultural crops and have been in danger of decline due to multiple factors, including traditional pesticide use. Vestaron has been named a Bee Friendly Partner of the Pollinator Partnership, the largest organization in the world dedicated exclusively to the protection and promotion of pollinators and their ecosystems. To further promote honeybee health, Vestaron supports the Bee Friendly Farming (BFF) program which emphasizes bee health on North American farmlands.

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Brown marmorated stink bug research update in California almond orchards

Sudan Gyawaly, Ph.D., Area IPM Advisor, University of California Statewide IPM Program and Cooperative Extension, Northern Sacramento Valley

Jhalendra Rijal, Ph.D., Area IPM Advisor, University of California Statewide IPM Program and Cooperative Extension, Northern San Joaquin Valley

Introduction

Several hemipteran pests, mainly stink and leaf-footed plant bug species attack developing almonds and cause economic damage to the crop. However, many of these hemipteran pests are sporadic and occur in high numbers only periodically; thus, they are often considered an occasional pest of almonds in California. However, reports of stink bug damage resulting in necrosis in nutmeats, largely known as “brown spot,” have been on the rise across the almond-producing regions of California lately. In addition, we have witnessed the spread of a relatively new invasive pest, the brown marmorated stink bug (BMSB) in certain areas of the Central Valley, where BMSB is established and causing economic damage. This has brought another challenge in pest management due to the complexity and asynchrony in the biology and behavior of these multiple hemipterans now present in almond orchards. This article presents the pest’s status and provides updates on ongoing research focusing on this new pest, BMSB, in the almond production system.

Identification and Biology

Brown marmorated stink bug adults are brown, medium-sized (about 3/4 inch long) stink bugs (Fig. 1). They appear very similar to a non-pest stink bug found in California almonds, the rough stink bug. However, the quick ways to differentiate BMSB with the rough stink bugs are that BMSB has clear white bands on its antennae and smooth shoulder edges, while both features are absent in rough stink bug adults.

BMSB survives the winter in the adult stage in manufactured structures, wood piles, and any other



FIG. 1. Adult brown marmorated stink bug. Credit: Karey Windbiel-Rojas, UC IPM.

shelters near orchards. Adults are active as early as March in California. Once active, the adult bugs mate and oviposit, typically a mass of 28 eggs, on the underside of leaves (Fig. 2). However, eggs are occasionally deposited on the other parts of the tree, including fruit. Eggs are light green when first laid but turn white as they age. BMSB larvae develop through five nymphal instars. The first instars have orange-red bodies and black stripes (Fig. 3). The second to fifth



FIG. 2. Brown marmorated stink bug eggs. *Credit: David R. Lance, USDA APHIS PPQ, Bugwood.org*

instars have dark black to brown bodies and have clear white bands on legs and antennae (Fig. 3). Second to fifth instar nymphs can feed and cause damage too, but the most economic damage occurs when adults feed on developing almonds.

Seasonality of BMSB activity in California almonds

BMSB potentially can have multiple generations per year in warmer temperature areas. However, in the United States, they typically have one to two generations per year. Our study over six years in California almonds has shown that BMSB has two generations per year in almonds. In our studies, BMSBs are captured in traps throughout the season and have overlapping populations indicated by adults and nymphs present simultaneously at different times of the year. The earliest adult capture in the northern San Joaquin Valley is in mid-March, which continues through November (Fig. 4).



FIG. 3(A)

Typically, early season activities of overwintering adults peak around late April, with subsequent first-generation adult activity peaking in June to July and the second-generation adults peaking in September to October.

BMSB distribution in the almond production region of California

BMSB distribution data from the California Department of Food and Agriculture indicates that BMSB has been detected in more than 40 counties in California (Fig. 5). Among those counties, 16 are reported to have established BMSB populations, mostly in urban areas. In almonds, BMSB has been confirmed to have established populations in orchards in Fresno, San Joaquin, Merced, and Stanislaus counties. We have been monitoring the BMSB populations in the almond production areas of California for the last six years. These studies monitor BMSB using clear-panel sticky traps (9 x 12 inches), visual sampling, and beating tray sampling.

In our most recent trapping study in 2022, we monitored the BMSB population in 10 almond orchards in the northern (NSJV) and 10 in the southern San Joaquin Valley (SSJV) regions. In the NSJV, BMSB was captured in eight out of 10 orchards (80%) surveyed and was the most common hemipteran captured in those orchards in this region. In the SSJV, BMSB was captured in five almond orchards out of 10 (50%). This was an increase from two orchards with BMSB in 2021. This study indicates that BMSB infestation in commercial almond orchards is expanding beyond the NSJV, where the established population and damage have been reported since 2017. This increase certainly has elevated the potential risks of crop damage by this pest in the future, including in the southern part of the valley.

FIG. 3. Brown marmorated stink bug first instar (A) and late instar (B) nymphs. *Credit: David R. Lance, USDA APHIS PPQ, Bugwood.org*



FIG. 3(B)

Feeding damage to almonds

Feeding by BMSB on almonds results in gumming, nut drop, dark feeding marks or brown spots on kernels, and sometimes shriveling of the kernels. In our study of caging BMSB adults on 10 to 15 almond fruits on a weekly basis, we found substantial nut drop (40 to 98% in Nonpareil; 28 to 96% in Monterey) due to BMSB feeding in the early season (March to April; in other words, the first six weeks of the study; Fig. 6). Similarly, in a field study, we recorded an average of 29 dropped nuts per square foot underneath the trees in the border row (Fig. 7) of an almond orchard that had heavy BMSB pressure.

Dropped nuts showed feeding injury on the hull (gumming, pinholes) and kernels. The nut drop intensity decreased significantly from the beginning of May when the kernel-filling begins (i.e., conversion of the ‘jelly’ stage into the solid nutmeat). At that time, the shell starts to harden, resulting in reduced nut abortion and drop.

After mid-May, most infested nuts did not drop; instead, they showed signs of feeding damage to kernels (gumming and presence of multiple dark spots and dimples/shriveling) when evaluated at harvest.

Monitoring and treatment decisions

A pheromone lure is an effective tool for monitoring BMSB populations and is commercially available. The lure consists of an aggregation pheromone and pheromone synergist that attracts both the adults and nymphs season-long. A commonly used BMSB trap consists of lures suspended on top of a sticky panel (9x12-inch double-sided sticky) affixed near the top of a wooden stake, about four feet above ground level. It is suggested to use a minimum of three sticky panel traps per orchard on a border-tree row adjacent to the BMSB immigration source, such as open fields, houses, or any other potential overwintering sites. Although the trap is good for BMSB detection, regular scouting for this pest and its damage in the orchard is necessary as the trap numbers do not reflect the extent of the damage. No treatment threshold is available for this pest in almonds. Like the treatment decision for other plant bugs and native stink bugs, BMSB treatment decisions in almonds should be made after the first sighting of any BMSB in traps and confirmation by visual surveys.

Management considerations

As an invasive species in the U.S., BMSB lacks many of the effective natural enemies in its new habitat.

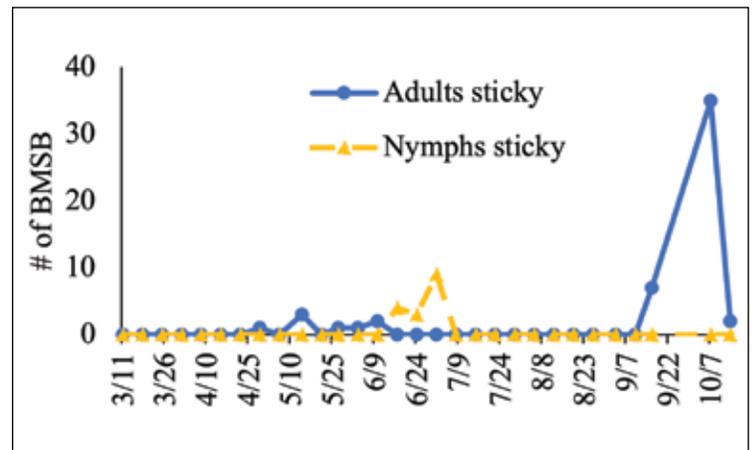


FIG. 4. Weekly brown marmorated stick bug (BMSB) activity in sticky panel traps in almonds, 2020.

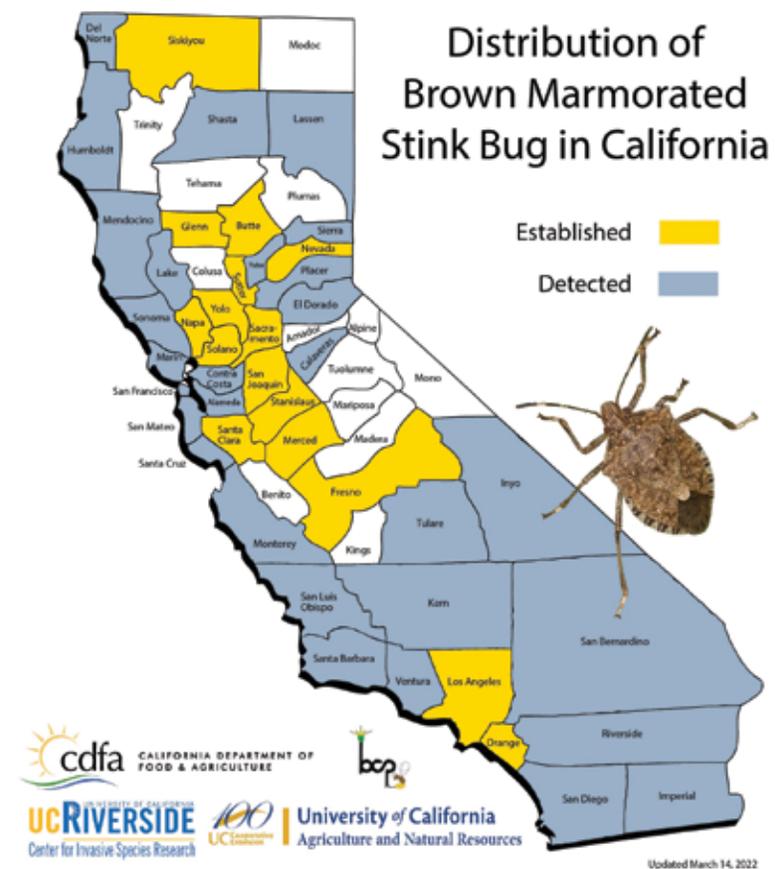


FIG. 5. Status of brown marmorated stink bug distribution in California.

However, some natural enemies, mostly generalist predators and parasitoids in the U.S. have been observed to feed on BMSB eggs and potentially provide some level of control. However, their presence in different crops and landscape situations is highly variable. Recently, a BMSB specialist parasitoid, the samurai

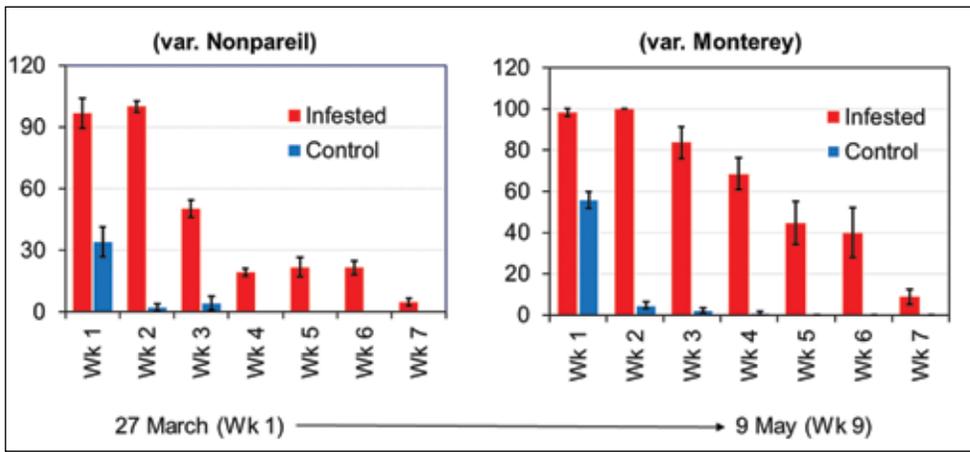


FIG. 6. Percent nuts drop by brown marmorated stink bug feeding early in the season in almonds. Var.=variety; Wk=week



FIG. 7

FIG. 7. Dropped nuts in border rows of an almond orchard due to brown marmorated stink bug feeding. Credit: Jhalendra Rijal, UC IPM.

wasp, has been found to occur naturally in many U.S. states, including California. Currently, research in collaboration with the California Department of Food and Agriculture–Biocontrol Lab is being conducted to evaluate the potential of samurai wasp releases in almond orchards, but this can take several years to be implemented if successful. So, the immediate option to control BMSB in crops in California is to use insecticides in a timely manner.

Several insecticide groups—pyrethroid, organophosphate, and neonicotinoid—have been used for BMSB management in other tree fruit production systems. However, due to its more recent invasion in California and its presence in a limited area, pest control options for BMSB control heavily rely on pyrethroids, which is known to have negative impacts to the natural enemies.

Considering those factors, we evaluated several non-pyrethroid insecticides for BMSB and other stink bug control in the last two years. Our field study, involving insecticide sprays in April using a backpack sprayer in a mature almond orchard with a history of BMSB and stink bug damage, indicated that acetamiprid and clothianidin reduced the damage (numbers of in-season gummy fruits evaluated at four weeks after insecticide sprays) significantly compared to the untreated control. Other insecticides, sulfoxaflor, indoxacarb, and acetamiprid plus methoxyfenozide products, also reduced the damage

compared to the untreated control, although the results were statistically insignificant. Our study contributed to the registration of some of these active ingredients to use against stink bugs in almonds. These products can be used as alternative or rotational products.

In organic production systems, products containing azadirachtin, pyrethrins, spinosad, and kaolin clay or a combination of two different products are used in other states. However, in California almonds, we have not looked at the efficacy of these products and will explore them in the near future.

On application timing, UC IPM recommends a spring spray for BMSB control. Studies in multiple cropping systems, including almonds, have shown that BMSB damage is border-driven, limited to a few rows near their overwintering hosts. Therefore, border sprays are also possible with follow-up applications, if necessary, later.

Consult the UC IPM website on BMSB in almonds for other management recommendations.

Acknowledgements

Multiple funding agencies, including the Almond Board of California, have supported various studies reported in this article. We also thank industry partners for facilitating and supplying insecticide products for various efficacy trials. ■

Featured Article

Pomona Farming charging forward in IPM achievements

by Alexis Silveira, CAPCA Communications Director

This year, Pomona Farming LP submitted an application for the Department of Pesticide Regulation (DPR) 2023 IPM Achievement Awards Program. Regardless of the outcome of these awards, CAPCA thought it was important to highlight what is happening in the field to further progress IPM.

Pomona Farming LP is located in the Central Valley of California. They manage more than 33,000 acres that consist of almonds, pistachios, olives, raisins and walnuts in California. They pride themselves on their sustainability practices, stating that they "work diligently to find the balance between growing food for many people and preserving the environment for further generations."

In the awards application, there are eight categories that the committee evaluates to make its recommendation to the DPR Director. Those include innovation, value, effectiveness, research support, organizational education, outreach, sustainable pest management, and leadership. Pomona Farming spent a great deal of time in each of these areas, detailing their actions and philosophies. Some key takeaways from each section are below.

Innovation

When possible, Pomona utilizes biological chemistry to harness nature's power and further relies on beneficial organisms to manage pests. In addition, they use variable rate mating disruption; this technology helps minimize the need for conventional insecticides. Pomona Farming has implemented these innovative IPM practices and is continuously evolving to adapt to the latest advancements in technology and ecological understanding. They showcase a commitment to minimizing pesticide use when and where possible,

promoting natural pest control, and fostering a healthier environment for sustainable almond production.

Value

At Pomona Farming the in-house PCAs are dedicated stewards of the land we farm, ensuring safe applications to protect our environment, employees, and customers. Their innovative IPM practices help lower pesticide residues, enhancing the overall quality and safety of the final product.

Effectiveness

The timing of pesticide applications has been optimized by tracking degree days and utilizing pheromone mating disruption technology. This targeted approach allows for more efficient pest control and reduces damage caused by pests, resulting in lower levels in the products being consumed. The effectiveness of these IPM practices benefits Pomona Farming and serves as a model for other growers to adopt similar sustainable and effective approaches. By reducing the reliance on herbicides and pesticides, growers can lower input costs, mitigate environmental risks, improve the quality of their produce, and contribute to the long-term economic viability of their operations.

Research Support

Pomona Farming is dedicated to staying at the forefront of industry knowledge and driving innovation in sustainable and effective pest management practices through its commitment to supporting pest management research. By actively participating in research and sharing resources, they contribute to the collective effort to advance pest management science and promote more sustainable agricultural systems.

Organizational Education

Overall, Pomona Farming is committed to fostering a culture of continuous learning and innovation. They

invest in regular educational initiatives, both internally and through external collaborations, to empower their employees and affiliated staff with the knowledge and skills needed to implement the latest advancements in pest management.

Outreach

Pomona Farming actively shares pest management information externally through various channels and platforms to promote transparency, education, and awareness. The company believes in engaging with stakeholders, customers, and the wider community to foster understanding and support for sustainable farming practices.

Sustainable Pest Management

Pomona Farming adopts and implements sustainable pest management practices that prioritize human health and social equity impacts, considers broad environmental protections, and evaluates economic impacts and benefits.

Leadership

Pomona Farming's leadership in sustainable pest management extends beyond its own operations. Through sharing best practices, collaborating with others, engaging in public communication, and advocating for policy changes, they inspire and influence the greater community to adopt IPM approaches. In leading by example and actively promoting sustainable pest management, Pomona Farming plays a pivotal role in driving positive change in the agricultural industry toward more environmentally friendly and socially responsible practices.

CAPCA would like to applaud Pomona Farming LP for its innovation and consistent practices in fostering IPM and SPM practices. We encourage and look forward to more of the industry promoting the IPM practices taking place in the field. For questions on the IPM Awards timeline for 2024, please visit DPR's website or follow the QR code. ■



Entomopathogenic fungi-based biopesticides contribute to more than pest management

Surendra K. Dara, Professor, Department of Horticulture, and Director, North Willamette Research and Extension Center, Oregon State University

Entomopathogenic fungi (EPF) are those that infect various arthropods such as ticks, mites, and insects. There are two major groups of EPF that play an important role in pest suppression. Members of the order Entomophthorales are more host-specific and examples include *Entomophaga maimaiga* in spongy moth, *Entomophthora muscae* and *Strongwellsea* spp. in flies, *Conidiobolus obscurus*, *Entomophthora planchoniana*, *Neozygites fresenii* and *Pandora neoaphidis* in aphids, and *Neozygites floridana* in mites. These naturally occurring EPF are fastidious and cannot be mass produced on a commercial scale, but cause epizootics when host populations are high and environmental conditions are favorable resulting in significant pest suppression. On the other hand, members of the order Hypocreales are more generalistic pathogens and can be infective to a variety of arthropods. *Beauveria bassiana*, *Cordyceps fumosorosea*, *Hirsutella thompsonii*, and *Metarhizium brunneum* are some examples of hypocrealeans. These can be grown on artificial media on a commercial scale and several biopesticide formulations based on various isolates of these fungi are available in the US and elsewhere. Both entomophthoralean and hypocrealean fungi have the same mode of infection. When fungal spores come in contact with their host, they germinate and enter the host body through mechanical pressure and enzymatic degradation of the cuticle. They multiply inside the host, invade the tissues, and finally emerge from the cuticle to produce spores that continue the infection process.

With growing emphasis on sustainable crop production with safer pesticides, the market for biopesticides including EPF-based ones has been increasing. Newer EPF isolates and modern technology contributed to the development of improved formulations. EPF-based products can be used for soil-inhabiting pests or their life stages like root aphids, pupae of thrips, and wireworms to foliar feeders or above-ground pests including the members of Coleoptera, Diptera, Hemiptera,

Orthoptera, Thysanoptera, and others. Considering their potential against a variety of pests on multiple crops, EPF-based pesticides should be an important part of integrated pest management (IPM) programs. However, there is a significant knowledge gap in effectively using EPF in IPM and fully exploring their potential in sustainable crop production.

Since EPF spores need to come in contact with the host, using them against the right pest or life stage is very important to obtain desired results. Sometimes, using EPF in combination or rotation with botanical or synthetic pesticides is more effective than using them alone against a particular pest (Dara 2013; 2015; 2016). As EPF formulations contain live fungi, label instructions should be followed for proper storage, transportation, tank-mixing, and application to maintain their efficacy. Compatibility can vary according to the EPF and its formulation, but studies showed that some isolates of *Beauveria bassiana* and *Metarhizium anisopliae* are compatible with several fungicides (Dara, et al., 2014; Roberti et al., 2017; Khun et al., 2021).

In addition to controlling arthropod pests, EPF being soilborne fungi also have a direct relationship with plants and other microbes. EPF colonize plant tissues and grow inside the plants in a phenomenon known as endophytism. Endophytic EPF grow as hyphae and do not produce spores. Although they cannot cause infection to pests feeding on those plants, they indirectly affect pests by reducing their fitness and survival by activating induced systemic resistance. When EPF are applied to soil, they form a mycorrhiza-like relationship with plant roots and help plants withstand biotic stresses and improve nutrient uptake. EPF can also antagonize plant pathogens through competitive displacement and antimicrobial activity. Thus soil and foliar application of EPF-based pesticides result in additional benefits in improving crop growth and health in addition to controlling pests through infection.

Several studies explored the non-entomopathogenic roles of EPF (Dara, 2019a). Soil application of *B. bassiana* had a positive impact on the survival, growth, and health of cabbage plants growing under water stress (Dara et al., 2017). *Metarhizium brunneum* also had a similar impact on plant growth in this study. Root and rhizosphere colonization by *Metarhizium* spp. improved shoot length and root weight in industrial hemp (Hu et al., 2023) and root colonization of *Metarhizium robertsii* alleviated hemp from salt and drought stress. *Metarhizium* spp. and *B. bassiana* transferred nitrogen from dead insects to the plant they colonized (Behie et al., 2012; Behie and Bidochka, 2014). These studies show the role of EPF in soil nitrogen cycle and how plants benefit from the endophytic relationship of EPF. Additionally, recent reports showed that endophytic *B. bassiana* induced the biosynthesis of flavonoids in oilseed rape (Muola et al., 2023) and flavonol content in licorice plants (Etsassala et al., 2023).

Seed treatment with *B. bassiana* increased plant height, stem diameter, number of leaves, shoots and apical buds, biomass, and total chlorophyll content in cotton and reduced cotton aphid (*Aphis gossypii*) populations

(Mantzoukas et al., 2023). Similarly, endophytic *B. bassiana* significantly reduced the reproductive rate and populations of the Russian wheat aphid (*Diuraphis noxia*) in South African wheat (Motholo et al., 2023). In corn, endophytic *B. bassiana* and *M. anisopliae* negatively impacted the survival, development, and reproduction of the fall armyworm (*Spodoptera frugiperda*) (Altaf et al., 2023).

Soil application of *B. bassiana*, *Cordyceps fumosorosea*, and *Metarhizium brunneum* antagonized *Fusarium oxysporum* f.sp. *vasinfectum* in cotton as effectively as some biofungicides (Dara et al., 2020). *Beauveria bassiana* treatment at a higher rate provided significantly better protection than all other treatments in this study. Both *B. bassiana* and *C. fumosorosea* inhibited the growth of *F. oxysporum* in vitro (Yanagawa et al., 2021). In corn, endophytic *M. robertsii* promoted plant growth and reduced southern corn leaf blight caused by *Cochliobolus heterostrophus* (Imtiaz et al., 2023). Induced systemic resistance is thought to be responsible for this protection. Similarly, *B. bassiana* applied as seed treatment, seedling root dip, and foliar spray reduced the incidence of rice sheath blight caused by *Rhizoctonia*



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solani by 69% and its severity by 60% under field conditions (Deb et al., 2023). *Beauveria bassiana* also resulted in 71% of mycelial inhibition in *R. solani* through the production of cell wall degrading enzymes, release of secondary metabolites, and mycoparasitism.

Multiple recent studies showed that EPF also have a negative impact on plant-parasitic nematodes. *Beauveria bassiana* and *C. fumosorosea* reduced the survival of the root-knot nematode, *Meloidogyne incognita*, in vitro (Yanagawa et al., 2021). Similar to the nematophagous fungus *Purpureocillium lilacinum*, both *B. bassiana* and *M. anisopliae* were effective in reducing galls caused by *M. incognita* in tomato and cucumber (Karabörklü et al., 2022). *Metarhizium anisopliae* was as effective as *P. lilacinum* with 75% reduction in gall formation and 85% control of second instar juveniles in tomato. *Beauveria bassiana* and *M. anisopliae* also resulted in about 85% control of second instar juveniles in cucumber. In another study, soil application of *B. bassiana* significantly reduced nematode infestation in tomato roots and *B. bassiana* treatment caused 60% mortality in nematodes in a lab assay (Kim et al., 2023). Volatile organic compounds, 1-octen-3-ol and 3-octanone from *M. brunneum* attracted and killed another plant-parasitic nematode, *Meloidogyne hapla*, in lab assays (Khoja et al., 2021).

As many of these recent studies indicated, the non-entomopathogenic roles of EPF is a new area of applied research interest with tremendous practical benefits. In addition to direct pest control through infection, EPF as endophytes offer multiple benefits in suppressing pest populations by affecting their fitness, antagonizing plant pathogens and plant-parasitic nematodes, imparting drought and salt tolerance in plants, improving nutrient uptake, and promoting overall growth and health of plants. Using EPF-based biopesticides comes under the microbial control of IPM (Dara, 2019b) and will contribute to insecticide resistance management. Additionally, the non-target benefits of EPF will help growers optimize the use of other inputs and related costs. EPF can be very important in sustainable crop production and a thorough understanding of their biology, interactions with pests, plants, pathogens, and other biotic and abiotic factors, and effective use strategies will help achieve their full potential. ■

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CAPCA Membership



Crystelle Turlo, CAPCA Chief Operations Director

Many of you may be familiar with the frantic pace that takes over the CAPCA office during August, September, and early October.

These months are a whirlwind of activity as we put the finishing touches on the CAPCA Conference & Agri-Expo that has been in planning for over a year. And yet, there is more than just the Conference. In these same months and through the end of the year, we are also gearing up for the coming new year and assisting many of you through the membership renewal process.

From late October to March, we transition from the high-speed preparations for Annual Conference into another marathon. During this period, we work even harder to ensure that your membership dues are processed as quickly as possible. To give you some perspective, typically CAPCA staff processes about 1,000 memberships from February to October. However, this number surges to approximately 1,500 from late October to March. It's a testament to our team's dedication as we navigate this surge with commitment and care, even if it's only sometimes as

efficient as we'd like it to be.

However, we recognize our shortcomings and are committed to making improvements. As we step into the New Year, we are actively creating processes and procedures to enhance our efficiency and member satisfaction. The CAPCA staff are working together to understand how we can provide a consistent and exceptional experience for our members. Our goal is to exceed your expectations as a member of CAPCA.

We want to express our gratitude to our members for your patience and kindness this year. You are the driving force behind our efforts, and your support encourages us to raise the bar continually.

As we stand on the precipice of a new year, let's celebrate the past year's accomplishments and look forward to a future filled with innovation and progress. We know we can achieve great things because we have the best support system – you, our valued members. Thank you for your membership this year, and here's to another year of growth, learning, and excellence at CAPCA. ■

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An associate member is any person not licensed as an agricultural Pest Control Adviser, but may hold other licenses issued by the State of California, and wants to promote the purpose of the Association.

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CAPCA Members Awarded \$1 Million CDFA Grant:

A Deeper Dive into the Full Spectrum of PCA Practices

by Patrick Dosier, CAPCA Innovation & Technology Director

We are honored to share that your professionalism, dedication, and expertise have been recognized with a \$1 million grant from CDFA for a CAPCA-led study titled “*Assessing SPM Adoption, Decisions, and Resources in California Cropping Systems.*” This isn’t just about the monetary support—it underscores the pivotal role PCAs play in our industry and provides an avenue to illuminate the multifaceted practices and decisions that PCAs consistently champion in the field.

Understanding SPM and IPM: It’s Not Either/Or

Beyond a nod to our accomplishments, this grant provides an avenue to unravel and document the plethora of practices PCAs currently harness in the field. IPM, a cornerstone of modern agriculture, focuses on a combination of methods for effective pest control that are economical, environmentally sound, and safe for human health. SPM, on the other hand, builds on IPM’s foundation adding layers of social equity and economic viability considerations. SPM doesn’t replace or negate IPM; it broadens the scope, ensuring a comprehensive approach to sustainable agriculture.

Why This Grant Matters to PCAs

The value of this study extends beyond financial incentives. While up to 200 PCA participants will benefit from a \$2,000 stipend, a one-year subscription to TELUS Agronomy, and free access to the resulting CE, the real value lies in the opportunity it presents. The modern SPM dialogue often lacks the nuanced, on-the-ground perspective of PCAs. This study provides an avenue for PCAs to voice their expertise, showcasing the diverse and effective practices they already implement. Furthermore, we’re taking meticulous measures to anonymize the data to ensure the identity of PCAs

and growers remains confidential, and precise field site locations will not be disclosed. This careful approach ensures participants won’t be singled out, enabling us to share our story without unnecessary scrutiny. If we don’t share our narrative, others will shape it for us.

How It Will Work

With the backing of this grant, CAPCA will delve into the on-farm practices across four diverse crops: grapes, lettuce, pistachios, and tomatoes. Collaborating with entities like UC IPM and related crop commodity boards, the goal is to ensure the data and resources developed from this study resonate with the real-world experiences of PCAs. Importantly, the Office of Pesticide Consultation and Analysis (OPCA) within CDFA has been exceptionally supportive, signaling a collaborative approach towards understanding and shaping the future of pest management.

The study has been meticulously structured into distinct phases to ensure we efficiently capture a comprehensive understanding of PCA practices:

1. Pre-funding Phase (Now)

- *Description:* Promotion of the study at the CAPCA Conference and through various CAPCA channels to gather a list of interested participants.
- *PCA activities:* Register interest at capca.com/memberships/#study and learn about the study in the January episode of the *Advice for the Adviser* podcast.

2. Study Design (Jan. 2024 to Feb. 2024)

- *Description:* CAPCA, alongside CDFA OPCA and UC IPM, will detail the study’s framework,

encompassing participant selection, data collection methodologies, and audit procedures.

- *PCA activities:* None required at this stage.

3. Participant Selection (Feb. 2024 to Mar. 2024)*

- *Description:* A comprehensive survey will be deployed, aiming to select candidates that showcase the diverse expertise of the PCA community. We are looking for independent, retail, and in-house PCAs with a range of experience levels.
- *PCA activities:* Complete the survey and await the selection outcome.

4. Participant Onboarding (Mar. 2024)*

- *Description:* Selected participants will be introduced to the digital platform, TELUS Agronomy, which will play a pivotal role in documenting their practices. An overview of the study's purpose and expectations will also be provided.
- *PCA activities:* Attend orientation sessions, acquaint themselves with the TELUS Agronomy platform, and familiarize yourself with study expectations.

5. Data Collection (Mar. 2024 to Mar. 2025)*

- *Description:* For one growing season and on one field site, participants will utilize the TELUS Agronomy platform and supplementary surveys to record their IPM and broader advisory practices. CAPCA will oversee, audit, and ensure study compliance.
- *PCA activities:* Regular documentation on the platform and participation in monthly surveys during the growing season.

6. Data Analysis (Apr. 2025 to Jul. 2025)

- *Description:* All data will undergo rigorous analysis to discern trends, identify potential gaps, and spotlight opportunities for extending pest management practices. A comprehensive report will consolidate these findings.
- *PCA activities:* No specific activities required.

7. Curriculum Development (Aug. 2025 to Oct. 2025)

- *Description:* UC IPM will spearhead the creation of a continuing education (CE) curriculum, pivoting on the study's findings, to broaden and enhance PCA practices. CAPCA will host the CE online.

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- *PCA activities:* Avail yourself of the opportunity to attend the newly-crafted online CE courses for free.

8. Final Reporting (Oct. 2025 to Dec. 2025)

- *Description:* CAPCA will produce a concluding report detailing the study’s outcomes, findings, and recommendations, ensuring it’s disseminated to CDFA-OPCA and the wider agriculture community.
- *PCA activities:* None required.

**Note: Fall-planted lettuce PCA activities will commence later due to crop seasonality, with a tentative start around Q3 2024.*

Amidst tightening regulations, emerging pest challenges, and the perennial task of promoting crop health, the resilience and adaptability of the PCA community shines

through. This grant, sponsored enthusiastically by CDFA OPCA, is a testament to that fact, and an opportunity to further amplify the indispensable role PCAs play in California’s agriculture sector.



Interested? Go to capca.com/grants to get on the PCA waitlist and learn about the study in the January episode of the *Advice for the Adviser* podcast! ■



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Eps 1 -2024 Regulations & New Grant Opportunity



CAPCA proudly announces our new bi-monthly podcast - Advice for the Adviser! Our podcast will premiere in January of 2024 and is hosted by Technology & Innovation Director Patrick Dosier and Communications Director Alexis Silveira.

The first episode will focus on 2024 changing regulations and a new grant opportunity for PCAs like you.

Advice for the Adviser can be found on Apple Podcasts, Spotify, or wherever you get your podcast. For more information please visit our website.



Mission & Purpose

CAPCA's mission is to facilitate the success of the PCA and to represent our 3000 members who provide pest management consultation for the production of food, fiber and ornamental industries of California.

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.



CAPCA

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Do you have a specific question?

FOR ASSISTANCE FROM ONE OF THESE
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CAPCA State Events	conference@capca.com
Chapter Questions	chapter@capca.com
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\$25,000	DIAMOND	CHROME
	\$10,000	\$6,500
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GOLD	SILVER	BRONZE
\$3,500	\$2,200	\$750
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* October comped ads are reserved for Diamond Sustaining Members and above, if you are interested in advertising in the October issue you will need to purchase an ad for the October issue.

** October issue guaranteed if booked by March 31, 2024

*** CAPCA will provide Sustaining Member companies redeemable Conference registration codes for their employees. \$100 service fee will be applied to any refund requested for a registration purchased without use of the provided redeemable registration code. Complimentary Conference Registrations: Pending the availability of hosting in-person events in 2024. CAPCA reserves the right to limit benefits and/or adjust to online programming value due to unknown gathering and spacing restrictions.

There is a limited window to sign up for 2024 Sustaining Membership: Sept. 11, 2023 to May 31, 2024. For Sustaining Membership sign-up, visit CAPCA.com.

The rights, privileges, membership benefits and unused portion thereof of CAPCA Sustaining Members applies only to the Company purchasing membership and cannot be transferred or assigned to said Company's subsidiary(ies) or any other entity(ies) of which the Company has full or partial ownership. The rights, privileges, membership benefits and unused portion thereof of CAPCA Sustaining Members applies only to the calendar year.

(Jan. 1-Dec. 31) for which the Company purchases membership and cannot be transferred or rolled over to any subsequent calendar year.

The Natural Chemistry Lab



by Galynn Beer, National Strategy & Product Management Lead

The expectation of a fertile soil is that it will share those nutrients with the crop. The production of a crop is what provides a return and that's why we want nutrition to be associated with crop production. Fertile soils are generally productive, so there is a correlation - but not always. Excesses of some nutrients can interfere with the utilization of good levels of other nutrients. Higher rainfall or irrigation amounts will cause some nutrients, such as potassium, to move down in the soil. With dry climates, high evaporation rates will keep cations at the surface. In addition, arid areas are often receiving irrigation water. Since the irrigation water generally carries other nutrients, the top of the soil starts acting like a coffee filter and the soil can take on the properties of the water. The result can be a potassium level that may have you gloating over how fertile your soil is, but could actually limit production. These factors matter as we manage crop nutrition. We can manipulate levels some, but then we're back to economics to see if productivity will justify the expense.

Let's get started. I'll go in the order that I look at a soil test analysis.

1. Cation exchange capacity (or CEC, and pronounced like a short phrase: cat-I-on)

The CEC shows us the nutrient and water holding capacity of the soil. This is the first indicator of the productive capability of a soil. The higher the number, the more water and nutrients it can store. I have seen all types of CEC soils be productive. Low numbers can be challenging because they need rain or irrigation more often since these sandy soils don't store much water. But crops root down well in a sandy soil and with sufficient water, they will reward you with outstanding yields. Higher CEC soils hold more nutrients and water, providing a buffer between rain events. A low CEC number would be 1, requiring superb management, and a high number might go as high as 50 if a lot of organic matter exists. Typical soils range between 10 and 30.

2. Calcium (Ca)

Calcium levels heavily influence soil productivity. I like a Ca base saturation range of 60-75%. Higher numbers will tie up, or crowd out, other nutrients. With a number higher than 75, I immediately look to see if it is tying up phosphorus and crowding out the micronutrient cations like zinc, iron and manganese. If it is, I need to make sure to allocate budget for these. This is a case of a low nutrient base saturation, such as phosphorus or one of the micros, and those low levels being related to an excess of something. In this example, it would be because of calcium. Phosphorus is very reactive with calcium and since zinc, iron, manganese and copper are cations, they can be displaced by high levels of calcium. Most commonly, you'd see associated low levels of zinc, iron and manganese. The importance of sulfur is elevated in this situation to counter high calcium levels. You aren't only considering crop needs for sulfur, but also the 'antidote' effect it has on the elevated cation level of calcium.

3. Magnesium (Mg)

I like Mg between 10 and 20%. Over 20, and compaction is more of an issue. An anaerobic condition can develop under heavy rain or even with severe drought. Under 10% and deficiencies begin to occur and applications should be made. Magnesium is central to chlorophyll development, so it is important to have enough of this nutrient available to your crop.

4. Potassium (K)

It should be between 3 and 8%. A low CEC soil should be in the high side of this range to supply ample amounts. If not, then it needs addressed. Rare instances of levels over 8% can exist and can restrict water infiltration. These high levels would most likely be found in low rainfall areas with potassium being brought to the soil through irrigation.

5. Hydrogen (H)

Any amount of hydrogen present means we are on the acidic side of the pH scale, meaning under 7. The higher the hydrogen number, the more acidic the soil. You'd like to keep your soil near the neutral level of 7. As soils become acidic, some nutrients are more readily released, such as iron and manganese. Often, you see crops that like high levels of iron and manganese grown in acidic soils, such as blueberries. But many beneficial microbes can't survive in an acidic environment, so generally lime is needed to raise the pH. This is done by adding lime with calcium and/or magnesium, which displaces the hydrogen and brings the pH up. Rain and irrigation (H_2O) bring H to the environment, so acidity slowly creeps back in. Also, various forms of nitrogen can contribute more than others. NH_3 and the conversion of urea to NH_4 , then to NO_3 through the nitrogen cycle, contribute to acidity. Don't panic; these forms of nitrogen don't cause a radical shift in pH, but over-applications do contribute additional hydrogen and creates some acidity.

6. Sodium (Na)

Sodium mostly comes into play in arid areas where irrigation water is being applied, but can be a factor in low areas of fields where water stands and in areas with a shallow water table. Sodium base saturation over 2% can limit production when temperatures rise and water is demanded by the plant to cool itself. Sodium holds on to water and can limit its movement into a plant.

The management of cations greatly influences the productive capacity of your soil. Proper balance is important for other nutrient inputs to provide maximum return. Calcium in a range of 60-75%, magnesium between 10-20%, potassium between 3 and 8%, hydrogen less than 10% and sodium less than 2% will provide the most consistent yields through a variety of environmental conditions.

In the February issue of the CAPCA Adviser, we'll tackle the other nutrients and then look at how all cations and nutrients work together and interact with each other. ■



2023 CE COURSES + BUNDLES

**Once purchased, courses are available to complete through 12/31/2023.*

2023 Conference Label Update* – \$40

2.0 DPR (1.5 Laws | 0.5 Other)

2023 CAPCA Conference online Label Update program, with presentations from:

- Hr. 1 – Corteva, AgBiome, Trece, TELUS Agriculture
- Hr. 2 – SAN Agrow, UPL, Nichino, Suterra

This was included with Early Registration (by 08/31/23) to 2023 Annual Conference in Reno, NV.

Industry 101 Part 1 & Part 2* – \$90

4.5 DPR (4.0 Laws | 0.5 Other)

Presentations from the 2023 CAPCA Spring Summit in Temecula, CA including:

- PART 1 – Spray Safe 101 | How to be Prepared to Defend a Violation | CAC/Enforcement Discussion Panel – Be Educated, Be Proactive
- PART 2 – PPE and Health Effects for Workers | Updates on Soil Fumigant Application Requirement | Why is Weed Management So Difficult?

2023 Spring Summit Recap* – \$110

5.5 DPR (1.5 Laws | 4.0 Other)

Continuing education presentations from the 2023 CAPCA Spring Summit in Temecula, CA, featuring presentations by: Ruben Arroyo, Paul Crout, Delia Cioc, Dr. Frank Byrne, Krystal Jenkins, William Baker, Dr. Nicola Irvin, Craig Laursen, Joelene Tamm, Robert Masson

Big Picture of IPM Tools* – \$40

2.0 DPR (2.0 Other)

Big Picture of IPM Tools Speakers:

- Dr. Melissa O'Neal, *The Future of Biologicals and How Biologicals Improve Your IPM Program*
- Dr. Karla Medina, *Nematicide Landscape 2022 and Beyond: Implications for Current and Upcoming Products*
- Dr. Emily Symmes, *Lessons Learned After 50+ Years of Mating Disruption: A Deep Dive into MD Science and Systems*

Rodents, Mosquitos, Trees, & Weeds* – \$80

4.0 DPR (0.5 Laws, 3.5 Other)

Burrowing Rodents & Mosquito Control – 1.5 DPR (0.5 Laws, 1.0 Other):

- Jim Hartman, *Managing Burrowing Rodents*
 - Nancy Voorhees, *Trends in Mosquito Control in California Mosquito and Vector Control Districts*
- Urban Tree Diseases – 1.0 DPR Other:*

- Dr. Igor Lacan, *Diagnosis and Management of Phytophthora Diseases in the Ornamental Landscape – Sudden Oak Death and Others*
- Dr. Drew Zwart, *Disease and Insect Management in Trees and Shrubs*

Weeds – 1.5 DPR Other:

- Dr. Scott Steinmaus, *Herbicide Resistance 2022*
- John Roncoroni, *Best Management Practices for Weed Control in Vineyards*

CAC Update* – \$20

1.0 DPR (0.5 Laws, 0.5 Other)

CACASA Update Speaker:

- Ruben Arroyo

IPM Crop by Crop* – \$120

6.0 DPR (6.0 Other)

Citrus Issues – 1.0 DPR Other:

- Dr. Frank Byrne, *Neonicotinoid Alternatives for Asian Citrus Psyllid Management in California*
- Victoria Hornbaker, *Asian Citrus Psyllid and Huanglongbing Treatment and Quarantines*

IPM in the Field – 2.5 DPR Other:

- Dr. Ivan Milosavljevic, *Maximizing IPM of Argentine Ant and Sap Sucking Pests (with Biodegradable Hydrogels, Infra-Red Sensors, and Cover Crops)*
 - Dr. Oleg Daugovich, *Soil-Borne Pest Management*
 - Dr. Ben Faber, *Avocado Herbicide Alternatives to Glyphosate*
 - Dr. Christopher Chen, *Abiotic Stress in Vines*
- Wine and Table Grape Round Table – Disease, Insects, & Weeds – 2.5 DPR Other:*
- Presenters: Dr. Emily Symmes, Dr. Christopher Chen, Kyle McAbee, Jeff Rasmussen



DPR CE TRACKING YOU CAN TRUST

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DPR regulatory changes will affect CE sponsors beginning on **January 1st, 2024**:

- ⚠️ Sponsors must report directly to DPR within 14 calendar days.
- ⚠️ Sponsors must track and report actual hours (in & out) for all license types, including private applicators.
- ⚠️ Sponsors must provide attendees with a verification of attendance (VOA) with an attendee's actual attendance, as calculated by the sponsor.

CE Hours Reported is a free service to provide CE tracking and reporting to the industry:

- ✔️ Streamline the CE course application process.
- ✔️ Track all attendees in & out for accurate hours reporting.
- ✔️ Automate the reporting to DPR and creation of VOAs for all attendees.
- ✔️ So much more!

Do you want CAPCA to keep tracking your CE hours in 2024 and beyond?

Scan here to join the waitlist!



Job Opportunities

Spray Department Supervisor

Location: Corcoran, CA

Company: J.G. Boswell Company

Based in Southern San Joaquin Valley, J.G. Boswell Company is engaged in the production, processing, and marketing of cotton, tomatoes, oil seeds, orchards, and cattle. Since its formation in 1925, the company has been closely held and operated by the Boswell family. Throughout its history, J.G. Boswell Company has demonstrated the stewardship of all of the resources employed with sustainable best management practices.

Job Summary: Supervises and coordinates activities of workers engaged in preparing fields and spraying operations in crop specialties such as cotton, safflower, alfalfa, wheat, and tomatoes by performing the following duties.

Essential Functions & Duties:

- Confers with district manager and/or agronomist to evaluate soil and weather conditions and to develop plans and procedures.
- Inspects fields, observes growing plants and harvested crop and confers with district manager and/or agronomist to determine work requirements for spraying according to time of year and condition of soil, plants, and crops.
- Determines number and kind of workers needed to perform required work and schedules activities.
- Inspects work performed, observes instrument and gauge readings, ascertains condition of crop, and performs related duties to verify worker adherence to instructions.
- Trains workers in work procedures, safety policies, and use of machinery and tools.
- Supervises the operation of necessary farm machinery.
- Suggests changes in working conditions and use of equipment to increase efficiency of work crew.
- Analyzes and resolves work problems or assists workers in solving work problems.
- Maintains time and production records.
- Performs activities of workers supervised.
- Reports to work in a timely fashion ready, willing,

and able to perform the essential duties and responsibilities of the job

Qualifications: To perform this job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed below are representative of the knowledge, skill, and/or ability required.

Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

Supervisory Responsibilities: Directly supervises 5 – 20 non-supervisory employees. Carries out supervisory responsibilities in accordance with the organization's policies and applicable laws. Responsibilities include interviewing, hiring, and training employees; planning, assigning, and directing work; appraising performance; rewarding and disciplining employees; addressing complaints and resolving problems.

Supervisors play a crucial role within their department by conducting in-field safety training and are responsible for enforcing the safety rules of the J. G. Boswell Company at all times.

Important Note: The J. G. Boswell Company has long been a leader in providing excellent working conditions and constantly strives to maintain this status. You, as a Spray Supervisor, are the Company to your employees and with that responsibility you are expected to be available and listen to them, explain your decisions, and be sure you are understood. Above all, be fair, consistent and respectful when carrying out your responsibilities.

Education and/or Experience: One year certificate from college or technical school; or three to six months related experience and/or training; or equivalent combination of education and experience.

Must have inventory management experience

Certifications/Licenses: Valid current California Drivers' license, which meets both our insurance company

guidelines and J. G. Boswell Company's Vehicle Use Policy.

Must have their PCA or QAL

Physical Demands: The physical demands described below are representative of those that must be met to successfully perform the essential functions of the position. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is frequently required to sit, twist their neck, and use their hands for simple grasping of objects.

The employee is occasionally required to stand; walk; use hands to finger, handle, or feel; reach with hands and arms above shoulder level; climb or balance and stoop, kneel, crouch, or crawl. They must also be able to bend their neck and at the waist up to 5 hours per day.

The employee must occasionally lift and/or carry up to 25 pounds.

Work Environment: The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is frequently exposed to moving mechanical parts, fumes or airborne particles and outside weather conditions.

The noise level in the work environment is usually moderate.

Salary Range: \$70,000 – \$110,000

FLSA Status: Exempt

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Chapter Events

Central Valley Chapter



(Above) Pierce Hanning and Darren Jones (Central Valley Chapter) spoke to MJC teacher Tim Brown's Plant Science class about what it's like to be a PCA and how CAPCA helps PCAs in the industry. (September 6th, 2023)

(Below) At their December 2022 meeting, Central Valley Chapter presented scholarship awards to three of the four winners. The fourth student was unable to attend and received his award the following week.



Central Coast Chapter

Central Coast Chapter's August 2023 CE meeting had a great turnout, with approximately 80 attendees and 15 company reps in attendance.



Let us know what is happening in your chapter.

Send email to: chapter@capca.com



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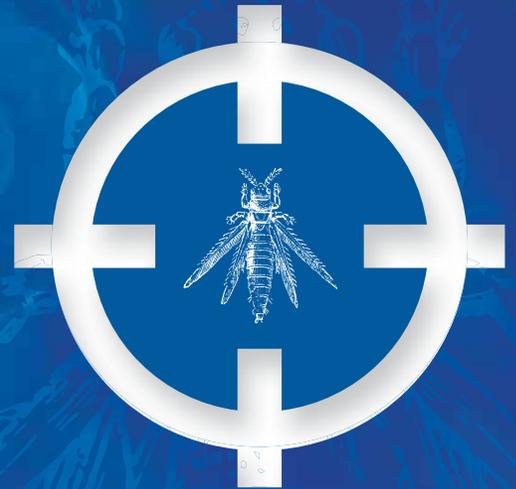
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