THE ADVISER

California Association of
Pest Control Advisers

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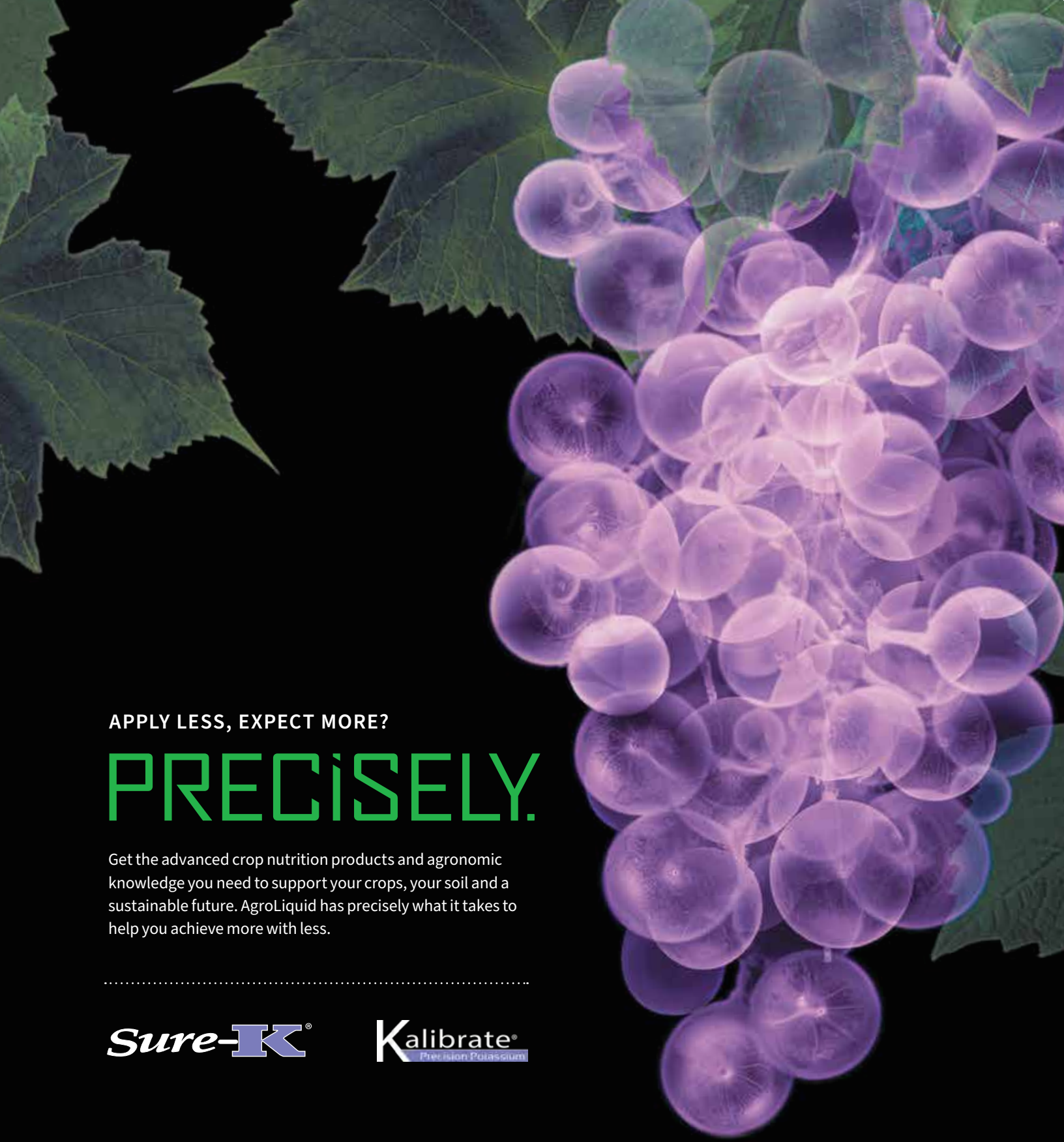
Leadership

Education & Networking

Advocacy



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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 2024 Programs

This year, CAPCA's Annual Conference and Agri Expo turns 50, and we will be celebrating the industry's achievements and the PCA license throughout the year. While 2024 is about celebrating the past and what has made CAPCA successful, it also is about looking forward toward our next 50 years. *To kick the year off, every 2024 CAPCA Active or Associate Member will receive 10 free hours of online CE over the course of the year with their annual membership.*

This year, we are excited to "say goodbye to your old Scantron and hello to CE Hours Reported." On page 48, you will find information about CE Hours Reported – the most anticipated change of 2024 that comes in response to Certification and Training (C&T) for pesticide handlers. As you start obtaining your continuing education in 2024, be on the lookout for the CE Hours Reported mark and ask your CE sponsor if they are reporting your hours to ensure they hit your CE Hours Report in your CAPCA account.

In October, CAPCA and the California Department of Food and Agriculture's Office of Pesticide Consultation and Analysis (CDFA OPCA) announced a $1 million grant opportunity that CAPCA is managing through 2024-25. The pilot project will follow the activities and decision making of 200 PCAs throughout the season to showcase the PCAs' ongoing commitment to Integrated Pest Management (IPM) in the field. We are finalizing applicant spots now – if you haven't already, please go to *capca.com/grants/* for more information and to apply.

As we look forward to the future, the CAPCA Board has announced a refresh of the CAPCA Awards that *includes nominations from you as the membership* – turn to page 8 to find out more and help us highlight the great work of PCAs and industry stakeholders going above and beyond on behalf of CAPCA and the PCA license.

Thank you to all the members, past, present, and future who have shaped CAPCA. We are looking forward to celebrating you!

Ruthann Anderson, Editor
ruthann@capca.com

Ruthann Anderson
CEO & EDITOR

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Leadership

Change 2.0

Paul W. Crout, CAPCA Chairman

President John F. Kennedy said, "Change is the law of life. And those who look only to the past or present are certain to miss the future."

What does that mean for CAPCA as we lean into 2024?

My Chairman's priorities for the next year continue to embrace and address change. We will be focused on three specific topics: Advocacy, Technology, and Member Value.

Pest Control Advisers and the agricultural industry in general are going to be facing significant change in the coming years. Continuing our active participation in industry groups like the Alliance of Farmers and Ranchers and Californians for Smart Pesticide Policy, we are dedicated to advocating for you, our members, to support our licenses and allow us to continue to do the great work we do for the pest management industry on a daily basis. This past year, CAPCA's voice has been heard by DPR and CDFA, with the first of several PCA-specific listening sessions/discussions being held in early December on the topic of Sustainable Pest Management and where the important role of PCAs fits into the roadmap. This important dialogue between PCAs and government stakeholders will give our membership the voice it deserves as we continue to advocate on behalf of our membership.

Technology is an ever-evolving piece, and CAPCA is investing resources to bring updates to our website, our online CE platform and our hours tracking/reporting system. Everyone who attended the Annual Conference this past October experienced the new QR code system that serves to meet new CE meeting hours tracking requirements to ensure our members' hours are counted. Our new digital hours tracking and reporting program is available to all CE Sponsors for FREE. CE Hours Reported has been up and running since January 1, 2024, providing meeting sponsors and attendees a simple and effective way to track and report CE hours in compliance with DPR's new Certification and Training regulations.

Maximizing member value also is a big priority for CAPCA. The Board and I recognize the financial challenges our sponsors, exhibitors, and members faced in 2023 and, potentially, into and through 2024. The leadership team has directed staff to prioritize time and energy to focus on a "PCA First" mindset as we enter 2024. *What does that mean?* A great example is the $1 million dollar grant CAPCA secured from CDFA to build a program to track and document the non-pesticide activities and decisions PCAs make before writing a recommendation. Data from this program will provide CAPCA and CDFA with important information that will highlight and quantify the critical role PCAs play in IPM and SPM.

Additionally, this year is the 50th Anniversary of the Annual Conference, a momentous occasion that highlights the resilience and importance of our association to the membership. We have seated a special 50th Anniversary Conference committee composed of past committee chairs and led by co-chairmen Adam Tavares and Dan Wickam. Be on the look-out for early registration starting in March and special program highlights including a new day pass registration for Sunday, October 13 as we work to celebrate this landmark anniversary.

Finally, you can be assured that CAPCA staff and the volunteers on the Board of Directors are working hard every day to ensure that you, the CAPCA membership, and all the PCAs in the state are being represented at the highest levels of state government, that your interests and license are being defended, and that efforts are continuing to bring new opportunities for professional continuing education, license renewals, and hours tracking.

Your membership matters to CAPCA. Your renewed membership serves as a vote for a shared voice and values to represent a license that is so critical to our career successes. This is what grounds and connects CAPCA PCAs across our 50-year history. ■

CAPCA Annual Awards in 2024

Nominations Requested

Since 1975, CAPCA has annually awarded a Member of the Year and Contribution to Agriculture Award winner at the CAPCA Annual Conference and Agri-Expo. As we prepare to celebrate the 50th Anniversary of the CAPCA Annual Conference and Agri-Expo, the CAPCA Board wants to invite you to nominate the 2024 CAPCA Member of the Year and Contribution to Ag winner.

In addition to our two traditional awards, the CAPCA Board of Directors has directed an additional award – the **CAPCA Advocacy Award** - to highlight CAPCA's commitment to and collaborative efforts for advocacy on behalf of the PCA License and CAPCA Membership. This award will recognize an individual involved in local politics or engaged in the sustainable development of sound pesticide policy in California. Nominations for the newly created award will come from the CAPCA Advocacy Committee, our work with the Alliance of California Farmers and Ranchers, CAPCA Lobbyist or CAPCA Leadership to celebrate stakeholders working on behalf of the PCA license and aligned industry for continued licensing professionalism, integrated pest management including pesticides, and success in agriculture and green spaces across California.

Nomination Process – How do I nominate someone?

Nominations open as of the publication of the February 2024 CAPCA *Adviser* magazine and remain open until May 15, 2024.

- Visit https://capca.com/nominations/ or scan the QR code for the nomination form.
- You will need to complete a separate nomination form for each person, company or organization you are nominating.
- The nominating person, company or organization will be asked to accept the nomination and provide some additional information to ensure the Nominating Committee, as well as the CAPCA Board of Directors who votes on the award winners, have adequate information for their decision.

Top nominees will be featured in CAPCA Adviser magazine alongside the Annual Award winners. We want to celebrate the diverse accomplishments of our membership and industry stakeholders. Award winners will be recognized at the CAPCA Annual Conference during the Membership Lunch on Monday, October 13, 2024.

Nomination Guidelines – Who is eligible?

Guidelines for awards are to be used only for idea generation, not to limit nominations. Members identify outstanding potential recipients to be nominated for one or both awards - Outstanding Contribution to Agriculture and CAPCA Member of the Year.

Outstanding Contribution to Agriculture:

- Individuals, companies, or organizations qualify for this award.
- Nominated parties may come from any industry (e.g., agriculture, entertainment, legislators, media, medical, etc.)
- In a given year, nominees should have accomplished any of the following:
  - » led a successful small- or large-scale public relations program, or
  - » facilitated an educational program, or
  - » accomplished something particularly proactive, or
  - » developed an agricultural/horticultural tool that will change industry forever, or
  - » consistently participated and volunteered over a span of years for a variety of projects, issues, etc. for the good of agriculture/horticulture.


Stanley W. Strew


A.G. Kawamura


John Kabashima

Some former Outstanding Contribution to Agricultural Award winners:

1992 – Stanley W. Strew, CAPCA Founder & Executive Director

2005 – A.G. Kawamura, CDFA Secretary

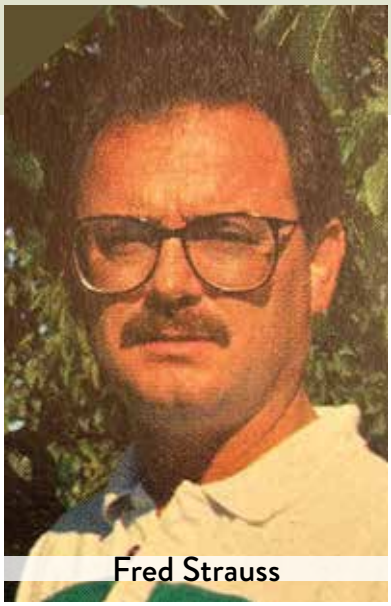
2011 – John Kabashima, UCCE Farm Advisor

2017 – Ruben Arroyo, Riverside County Agricultural Commissioner


Ruben Arroyo

CAPCA Member of the Year:

- This award is limited to a CAPCA member who is a licensed Pest Control Adviser. The award recognizes their contribution back to the PCA profession via CAPCA activities.
- Nominations should consider the various activities the PCA performs above and beyond the industry norm, or ways in which they have actively worked toward the advancement of the understanding, recognition, and/or professionalism of PCAs.
- Nominees should participate in CAPCA committees and activities, allied organizations, and/or local community projects (i.e., Scouting, Kiwanis, etc.).
- Nominees should display the following characteristics:
  - » strives for integrity,
  - » seeks continual personal development,
  - » gives back to the industry,
  - » is looked upon as a leader,
  - » is respected by many, and
  - » cares about making a difference within the PCA profession, as well as agriculture and horticulture in general.



Fred Strauss

Sean Morelos & Jeremy Briscoe

Some former Member of the Year Award winners:

- **1991 – Fred Strauss** for his CAPCA advocacy and ambassadorship as a PCA
- **2008 – Jeremy Briscoe/Sean Morelos** for their development of the Pathway to PCA program
- **2020 – Dan Wickham** for his role in the CAPCA Board, CAPCA Conference Committee and SoCal Chapter including mentorship, education and professionalism

Dan Wickham

Thank you for helping us recognize CAPCA PCAs, individuals, companies and coalitions doing great work on behalf of the PCA license and the industry!

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Featured Article

California Department of Pesticide Regulation

DPR Update: Envisioning a California where pest management is safe, effective and sustainable for everyone

To support a healthy food supply and agricultural sustainability, and to protect public health and the environment, pest management is essential. Licensed and certified pest management professionals play an essential leadership role in the practice of pest management across the state.

Reflecting on 2023, several examples of this essential work were highlighted during multiple tours DPR attended in counties across the state. Department leadership met with growers, licensees, PCAs, County Agricultural Commissioners, and others to visit and tour local farms, nurseries and packing houses, and learn about the diverse needs within each county when it comes to managing pests.

The tour highlighted the key partnership role that licensed pesticide applicators play and the critical insight they provide into the multiple, diverse considerations to evaluate and to successfully and feasibly advance sustainable pest management on a systemwide scale in California.

Integrated Pest Management has been practiced for decades and PCAs have contributed to the improvement of this practice over the course of that time. Notwithstanding those improvements, extreme weather conditions, flooding and other conditions are impacting both pest pressures and the tools, technology, and methods available for pest management in agricultural and urban settings. These changing dynamics are seen and addressed first by PCAs and other licensed pesticide applicators who know firsthand the role of pest management decisions affecting the food supply chain and agricultural sustainability.

Looking ahead to 2024 and beyond, DPR continues to value and encourage feedback from PCAs and others on-the-ground conducting pest management every day to inform next steps and highlight the tools and resources needed to support the availability of effective, feasible and sustainable pest management in agricultural and urban environments.

Sustainable Pest Management Roadmap

In 2023, DPR, along with the California Environmental Protection Agency and the California Department of Food and Agriculture, released the Sustainable Pest Management Roadmap, which was developed over two years by a diverse, cross-sector work group to provide recommendations to advance a sustainable pest management future in California. Work group members included representatives from conventional and organic agriculture, urban environments, community and

environmental groups, Native American tribes, researchers, and government.

The Roadmap defines sustainable pest management as a holistic, systemwide approach that builds on the practice of Integrated Pest Management by incorporating broader sustainability considerations of human health and social equity, environmental protection, and economic vitality.

The roadmap supports agriculture and food systems by articulating priorities for streamlining DPR's registration and evaluation processes to expand the availability and adoption of safer alternative pest management tools, application methods and practices; making greater investments in research and education; , and enhancing programs to prevent entry and spread of invasive species, among other recommendations.

Following the release of the Roadmap, DPR continues to engage with stakeholders across the state to hear feedback – including opportunities and obstacles to make this kind of systemwide transition feasible, and economically viable.

In October, DPR Director Julie Henderson spoke at the CAPCA Annual Meeting, alongside California Department of Food and Agriculture Undersecretary Christine Birdsong, to share thoughts on the implementation of Roadmap recommendations and the critical role that CAPCA members, PCAs and licensees across the state, can play to make this vision a reality.

At the CAPCA Annual Meeting and in follow-up conversations with CAPCA members, DPR heard the value PCAs place in responsibly using the tools available to manage pests, the challenge with getting new, alternatives tested, trialed and registered in California creating a pinch point for the adoption of alternatives, the implementation of IPM occurring on a much larger scale by pest management advisors than currently understood or tracked and the opportunity to increase Continuing Education credited IPM courses, among other important feedback.

DPR recognizes the role of PCAs play as key partners, ambassadors and IPM experts to move forward these ambitious ideals for safe, effective, and sustainable pest management on a broad, systemwide scale and values PCA engagement as the department plans next steps for implementation.

DPR Strategic Plan

Informed by the conversations with stakeholders and building on the important work conducted every day by the department, the department released a draft strategic plan in September 2023.

The plan signals the department's priorities and investments for the years ahead and shares the department's vision of a California where pest management is safe, effective, and sustainable for everyone.

DPR will continue to engage with PCAs and other stakeholder groups as the department works toward the specific actions to achieve strategic goals over the next five years and share measurable progress milestones. This is just the start of that conversation.

New regulations effective Jan. 1, 2024

As a core part of its work, DPR also finalized multiple regulations in 2023 that went into effect Jan. 1, 2024.

Neonicotinoids Regulations

Regulations effective this year on the use of neonicotinoids protect pollinators from risks associated with neonicotinoid use. As part of its outreach to help PCAs, growers and all licensees learn more about these regulations and how they will be enforced, DPR put together guidance on the regulation and crop-specific information on how and where neonics can be used.

Scan the QR code for more information.

DPR also has crop-specific factsheets:

Berries & small fruits

Oilseed crops

Citrus

Pomme fruits

Cereal grain

Root & tuber vegetables

Cucurbit

Stone fruits

Fruiting vegetables

Tree nuts

Legume vegetables

1,3-Dichloropropene Regulations

DPR in 2023 also adopted new regulations to further restrict the use of 1,3-Dichloropropene (1,3-D) to address acute and cancer risks to residential bystanders. The regulations require the use of either totally impermeable film (TIF) tarping or other application methods such as deeper soil injections that provide comparable reductions in risks to residential bystanders by lowering emissions. These alternative application methods were developed through a pilot study conducted with pesticide applicators, growers and county agricultural commissioners.

The regulations increase the required distances between 1,3-D applications and houses, schools, or other buildings where people are present. They also limit the volume of 1,3-D applications and the size of fields where the pesticide can be applied, among other restrictions.

DPR and the Office of Environmental Health Hazard Assessment (OEHHA), through a joint and mutual process, are developing additional regulations to address cancer risks to occupational bystanders. The occupational bystander regulations will protect field workers working near 1,3-D applications.

Certification and Training Requirements

Several changes to DPR's licensing and certification requirements took effect Jan. 1.

In December 2023, DPR provided County Agricultural Commissioners with three-month enforcement discretion (to April 1, 2024) to allow Qualified Applicator License (QAL) and/or Qualified Applicator Certificate (QAC) holders time to acquire their new soil fumigant or non-soil fumigant license categories as required by the recently amended certification and training regulations. See page 16 for summary and link to the full enforcement letter.

The new regulations will improve the competency standards for certified applicators using California restricted materials, which include federally restricted use pesticides (RUPs). The regulations also:

- improve certification standards for certified applicators;

- create additional certification categories for certified applicators;
- increase protection for noncertified applicators using restricted materials under the direct supervision of a certified applicator through enhanced pesticide safety training and standards for supervision of noncertified applicators;
- establish a minimum age requirement for certified and noncertified applicators using restricted materials under the direct supervision of a certified applicator; and
- improve standards for CE courses.

In addition, new forms will be incorporated by reference and some forms currently incorporated by reference will be amended to align with the proposed action.

Proposed regulations to develop statewide notification system

DPR proposed regulations on Nov. 3, 2023, to develop a statewide system that will provide information to the public prior to the application of restricted material pesticides.

DPR's proposed system builds on the state's restricted material permitting system to provide the public with advance, more transparent, equitable access to information about restricted material pesticide applications. The system that DPR is developing will provide information about a permitted pesticide before it is applied, including the product name, chemical or active ingredient, application method, time and date of intended application and the location of the application in a one-square mile section. The location information included in DPR's proposed system is based on the Public Land Survey System's Township Section Range coordinates, which is used consistently across all California counties.

To inform the proposed regulation and system development, DPR conducted extensive public engagement between 2021 and 2022, hosting four focus groups and eight public meetings at various locations across the state and virtually. County Agricultural Commissioners in four California counties conducted pilot projects in 2022 to test proposed design elements, and the UC Davis Center for Regional Change conducted an independent evaluation to review the effectiveness of the pilot projects design and inform the development of the statewide system.

DPR is conducting beta testing in 2024 for the proposed system, which gives the public access to information in Spanish or English in two ways: through an anonymous search function on a web-based map, or by signing-up to receive emails or text messages when a pesticide application is planned near a specified California address.

The system is anticipated to launch following finalization of the proposed related regulation.

Looking ahead

Looking ahead to the rest of 2024, DPR is committed to welcoming feedback and increasing direct and meaningful engagement with PCAs to inform the department's work. This includes regular conversations with CAPCA leadership, regular contributions to the CAPCA Advisor and by participating directly with PCAs across the state to learn more about changing pest pressures, tools and resources needed to expand IPM practices or accelerate innovative approaches to sustainable pest management.

DPR celebrates the important work of licensed pest control advisors in the implementation of DPR's vision for a California where pest management is safe, effective, and sustainable for everyone. Thanks to CAPCA members for being a key part of this vision and continuing to engage with DPR in the years ahead. ■

Advocacy

Implementation of Certification and Training for Pesticide Handlers

by CAPCA Staff

CAPCA has been actively engaged in the ongoing discussions around the implementation of Certification and Training for Pesticide Handlers as part of our priority Advocacy efforts. We expressed concern a number of times to DPR at various points, including when the regulations were finally published in July 2023, that the timeline to retest and license QALs and QACs with new categories was overly aggressive. With more than 5,000 licensees impacted, the plan to retest and relicense in less than six months felt like an impossible task since licensing also focused on renewals, CE approval and licensing new PCA, QAL and QACs. Because of this, the consequences of failure fall most heavily on the applicator and grower communities. We continued to monitor actual testing availability and raised concern with DPR over outreach efforts and access to testing materials, as well as tests.

On December 8, 2023, as a result of CAPCA's oversight and communication, DPR issued a notice to County Agricultural Commissioners (CACs) that hypothetically authorizes them to use discretion in enforcement of the new licensing and testing protocols. Along the way, CAPCA has kept our membership updated with earlier enforcement letters to clarify Certification and Training for PACs. We believe this is equally important for you to continue to hear the most up-to-date reliable information from CAPCA. At the time of publication, it is not clear whether every county will exercise this enforcement discretion, so if you are a QAL or QAC who has not tested for the new categories but have the old categories on your license in 2023, please contact your local CAC to understand your options for purchasing and applying fumigants through March 30, 2024. ■

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The Endangered Species Act (ESA) brings a regulatory revolution

Part 2: How ESA Compliance is Going to Impact PCAs

by Patrick Dosier, CAPCA Innovation & Technology Director

The first article in this series discussed the significant regulatory shifts brought about by the Endangered Species Act (ESA), focusing on the US EPA's 2022 ESA Workplan. Shaped by the significant and successful 'Mega Suit' against the US EPA, this transition features the incorporation of the Precautionary Principle in pesticide regulation at the Federal level. This principle advocates for taking preventive measures when an activity poses potential harm to the environment or human health, even if some cause-and-effect relationships are not scientifically established.

The ESA Workplan: Interim Mitigations and Future Registrations

The US EPA's ESA Workplan indicates a significant change in pesticide regulation, establishing interim mitigation measures as a rapid response to court mandates. These measures are considered temporary, but could span 10 to 20 years. In future pesticide registrations, thorough risk evaluations of listed species will be required with specific mitigations developed for inclusion on the pesticide label. This interim approach is designed to allow current products to remain registered and enables the US EPA to uphold its obligations to the ESA while these long-term solutions take shape.

Challenges in Compliance for Specialty Crops

The US EPA's Herbicide Strategy, the first widespread component of the ESA Workplan, significantly impacts pest management practices on commercial farms. This strategy requires growers within a Pesticide Use Limitation Area (PULA) to implement environmental mitigation measures to prevent offsite herbicide movement. A PULA is a geographic zone where US EPA considers an endangered species may have a habitat. These environmental mitigation measures include residue tillage management, terracing, riparian buffers, vegetated ditches, vegetative filter strips, constructed wetlands, water retention systems, tailwater recovery systems, and sediment basins. The Herbicide Strategy also includes many drift mitigation measures.

The Strategy introduces a point-based system for implementing these mitigation measures to protect endangered species from herbicide exposure. Each measure is assigned a point value based on its effectiveness in reducing runoff, erosion, or drift. Farmers need to implement these measures to accumulate the required points for herbicide use, which may vary based on the herbicide and field location.

Currently, these ESA runoff and erosion mitigations will apply to all herbicides with an organic carbon partitioning coefficient (Koc) of less than or equal to 1000L/kg. This means widely used herbicides, like glufosinate, sulfonylureas, metolachlor, 2,4-D and oryzalin, may require environmental mitigations for use within a PULA, depending on what species are present.

Bulletins Live! Two (BLT)

The BLT system is an interactive online database, which is used for identifying these PULAs. Applicators, growers, and PCAs are directed to the BLT website for geographic-specific restrictions.

This website is not user friendly. It is not compatible with all browsers. You will need to have the US EPA Registration number available for all your intended products, and then search each one sequentially to verify if your intended usage will encounter restrictions. Additionally, the US EPA reported in an August webinar that there is not a way for third-party service providers to access this database. So, for now, this work will have to occur outside of your recommendation writing software.

For PCAs, this means two types of impact: 1.) that we will need to add yet another time-consuming, disjointed, and laborious task to the pesticide recommendation writing process; and 2.) if your application does fall within a PULA, you and your grower will need to discuss the feasibility of implementing the mitigations, or you will need to consider an alternative pest control strategy.

Agricultural Community Concerns

The agricultural community has expressed significant concerns about the Herbicide Strategy, citing its complexity and potential to impose new, costly regulatory burdens. The strategy's applicability and practicality across different regions and crop types have been particularly questioned.

An image from the BLT database showing the extent of California that may be affected by a PULA (within the pink highlighted areas)

Scan here to go to US EPA Bulletins Live! Two (BLT) website.

The proposed measures are misaligned with California's agricultural conditions as they focus on soil erosion and runoff reduction in areas with higher rainfall, unlike California's low-rainfall and low-volume irrigation systems. They also fail to factor in the conditions found in permanent cropping systems. This mismatch poses a significant challenge for California growers to accumulate enough points for herbicide use.

The BLT dataset does not offer practical granularity. Frustratingly, the entire Central Valley is within a PULA, but not for all products. So, in the Central Valley, you will be required to check BLT on every application but may not be required to act. In US EPA's public comments, even environmental activists complain that this low granularity is impractical and will not lead to better species protection. Rumors suggest that the US EPA is planning a major overhaul of the BLT system. The DPR's PRESCRIBE database, with its granular and updated data, could be a more suitable example of a dataset for developing region-specific mitigation strategies.

Conclusion

As the US EPA ESA Workplan is mandated to move quickly, there is a pronounced need for regionally tailored approaches and for more user-friendly compliance tools. The next articles in this series will explore regional conservation agreements and the potential for California growers to command a market premium for their efforts in promoting biodiversity and sustainable practices. ■

The role of governmental advocacy to safeguard Pest Control Advisers

by Taylor Roschen, Governmental Advocate, Kahn, Soares & Conway (KSC)

It's undeniable that in the dynamic landscape of California agriculture, pest control advisers are indispensable. As stewards of the state's agricultural health, you play a pivotal role in ensuring the well-being of commodities, farmers, and the environment.

However, as the challenges faced by the industry extend beyond the field, your role and function are not relatively well-known to the general public, or worse, grossly misconstrued in urban settings and state bureaucracy. In partnership with CAPCA leadership, we at Kahn, Soares, & Conway serve as your Sacramento advocates. Our goals are to break down misconceptions, educate the Legislature about your foundational roles to advance sustainable agriculture, and influence policies and politics to ensure your business and your community can thrive.

And we can't emphasize enough the critical importance of ensuring your voice is heard. The legislative landscape in 2023 reinforced that this is not your grandfather's Legislature. The redistricting efforts in 2022, followed by the first impacts of 12-year term limits for long-serving legislators, led to the loss of institutional knowledge. This void will continue to be filled until 2026 with ambitious freshman legislators, who predominantly lack experience or interests in agriculture, led by influential Capitol staff, committee consultants, and irrational special interests.

This challenge is further compounded by an activist administration, a continuously complex regulatory landscape, and a growing public discontent with our food systems. The year 2024 will see new legislative leaders, Speaker of the Assembly Robert Rivas and Senate Pro Tem Mike McGuire, taking the reins to guide their colleagues. As with any leadership change, opportunities arise.

Therefore, as we step forward to address these trials, including the significant pest detections and emerging threats in late 2023, this year needs to be the year of education. It's about reintroducing and articulating the critical role of the PCA, not only to protect California agriculture's legacy and natural resources but also to highlight how you are essential to advancing the Legislature and the Administration's goals. These goals include agricultural sustainability, sustainable pest management, and public and environmental health.

This charge requires us to be introspective, actively listen to others' expectations, and be open to sharing more about the great work you do. You don't have to change who you are; you have to become more of who you already are—and that requires you to speak up. CAPCA and your advocates are here to help, but your active participation is key to ensuring your invaluable contributions are recognized and appreciated. ■

Editor's Note – to learn more about CAPCA's Chapter Advocacy Leadership (CAL) Program, please see next page.

CHAPTER ADVOCACY LEADERSHIP PROGRAM TRAINING

APRIL 24, 2024 | 11 AM

TELUS AGRICULTURE & CONSUMER GOODS IN CLOVIS

Save the date and join chapter members from across the state to learn more about CAPCA's Chapter Advocacy Leadership (CAL) Program.

This event will focus on the program's roots and useful tools for relationship-building with your local and state elected officials. Become a strong voice of the PCA industry and help CAPCA build a unique network of strong relationships with elected officials in every chapter.

Lunch will be provided.

REGISTER HERE

Membership

CAPCA: Empowering Pest Control Advisers in 2024 and beyond

Crystelle Turlo, CAPCA Chief Operations Director

In the ever-evolving landscape of pest control in California agriculture, CAPCA stands as a stalwart ally for the PCA. What began as a mission to support PCAs has transformed into a comprehensive association that continues to offer quality continuing education that matters, robust advocacy, relevant industry networking events, and reliable updates.

As we step into a new year, CAPCA acknowledges the dynamic needs of its members and commits to growing and evolving alongside them. CAPCA recognizes the pivotal role that your PCA license plays, and the association is dedicated to unwavering advocacy for its members across the state. CAPCA urges members to engage with their representatives, emphasizing the power of a united voice in shaping policies that impact the pest control profession.

Unwavering commitment to quality information and communication remains at the core of CAPCA's ethos. While the Adviser magazine continues to be a cornerstone of information dissemination, CAPCA is embracing innovation by using diverse communication formats. Members are experiencing a richer and more interactive experience, from revitalized social media engagement to more dynamic email communications. Our goal is to provide members with a seamless flow of pertinent information, keeping them abreast of the latest developments and industry insights.

CAPCA's evolution is not just a reflection of the industry's changes, but also a proactive response to the evolving needs of its members. The association's dedication to professional growth is evident in its commitment to ongoing education, ensuring that members stay at the forefront of industry advancements by providing at least ten hours of CE to all members in 2024.

In 2024 and beyond, CAPCA invites PCAs to make the association their steadfast partner in navigating the complexities of the pest control landscape. As the industry transforms, CAPCA remains a beacon of support, empowering its members to thrive in an ever-changing environment. Join CAPCA, and let's shape the future of pest control together. Your voice matters, and CAPCA is the platform where it resonates the loudest. ■

6 Reasons to be a CAPCA Member

As a CAPCA member, you receive exclusive benefits that are designed to keep you well-informed and successful in your work as a PCA.

1. **Quality CE** — Quality online continuing education offerings to ensure that members have access to CE hours throughout the year. 2024 Members will have the opportunity to receive 10 free hours.
2. **CE Hours Report** — Access to print your CE Hours Report when logged into CAPCA.com.
3. **Adviser Subscription** — Our trade focused magazine, the Adviser delivered bi-monthly and monthly CAPCA e-newsletter to keep you informed and up to date.
4. **Member Dashboard** — A "Members Only" webpage. Explore job opportunities or the member-only news section.
5. **Volunteerism** — Opportunities to volunteer for Chapter leadership, state Board or a committee.
6. **Advocacy** — Professional representation in legislative and regulatory issues that impact your PCA License. CAPCA is solely focused on advocating on behalf of your license.

Want to earn 10 FREE CEUs?

Renew today or become a new 2024 Individual Member

CAPCA PODCAST

ADVICE FOR THE ADVISER

ADVICE FOR THE ADVISER

Ep. 2 - C&T and CDFA 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 full-length episode focuses 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 podcasts. For more information, please visit our website.

Thank you to our 2024 Spring Summit Sponsors!

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	Member	Non-Member
Pre-Registration	$250	$300
Onsite Registration	$275	$350

Join the CAPCA Board of Directors and staff at the 2024 Spring Summit in Napa Valley on January 30-31, 2024. The event will be hosted at the NapaValley Marriott Hotel & Spa.

The two-day program will consist of continuing education and networking events for PCAs throughout California. Registration is open! You can find sponsor, registration, and program information on capca.com/events.

To view the full schedule of continuing education and networking opportunities please visit capca.com/events. You can register by following the QR code to the left. We hope to see you there!

DPR HOURS TBA | CCA TBA
MUST ATTEND TUESDAY AND WEDNESDAY BOTH FOR TOTAL HOURS

30-31 January

REGISTRATION IS OPEN!
NAPA VALLEY MARRIOTT HOTEL & SPA
Find more information scan the QR code

California Association of Pest Control Advisors Invites you to our

50th Annual CAPCA Conference & Agri-Expo

October 13- 15, 2024

DON'T MISS IT

Registration opens March 1, 2024

events.capca.com

Disneyland Resort

Annual CAPCA Conference & Agri-Expo

CAPCA is celebrating a significant milestone in 2024 - the 50th Anniversary of our Annual Conference and Agri-Expo in Anaheim! We hope you will join us as we celebrate the past and look forward to the future of the PCA license and CAPCA! Along with great continuing education and networking opportunities for PCAs and industry stakeholders, we are incorporating some special ways to celebrate CAPCA. This year we will feature a new Exhibit Hall and CE Breakout Day Pass for Sunday, October 13th, a toast to "another 50 years of great advice" at a reception on Monday, October 14, 2024 and feature throwbacks from each era of CAPCA. As we proudly reflect on our past achievements and look forward to future advancements, we warmly invite CAPCA members, collaborators, agricultural stakeholders and friends to join us in recognizing the crucial role and enduring impact of the PCA community.

As a part of celebrating the CAPCA past, present and future during the 50th Anniversary, CAPCA will be shining a light on legacy Sustaining Members, volunteers and leadership within CAPCA with a Disney Institute Training – Zone of Exceptional Service on Saturday, October 12, 2024 . A unique training that incorporates both classroom and in-park experiential learning. If you or your company would like to secure a seat to Thank Your PCA - email ruthann@capca.com

Learn more about the 50th CAPCA Conference and Agri-Expo by scanning the QR code

2024 Stanley W. Strew Educational Fund, Inc.

SCHOLARSHIP

Photo: Fred Rehrmann, Elysian Fields

A scholarship opportunity is available for students interested in careers in the pest management industry. The scholarship is sponsored by the California Association of Pest Control Advisers (CAPCA) and is administered by the Stanley W. Strew Educational Fund, Inc.

The CAPCA Scholarship will provide $3,000 to a selected college student actively engaged in a PCA career pathway. The scholarship recipient will be selected by the SWS Board of Directors.

Applications are available for students who are currently attending college in an agricultural/horticultural related field or who are entering or returning to college in an agricultural/horticultural related field in the fall and will have a junior level status.

Nominees should submit a completed application form and copies of their transcripts. ***Applications must be postmarked no later than May 3, 2024 and submitted with required letters of recommendation so that the committee can make final selections.*** The student selected will be notified in July.

For application information please contact CAPCA at (916) 928-1625 or email scholarship@capca.com

https://capca.com/career-development/#scholarships

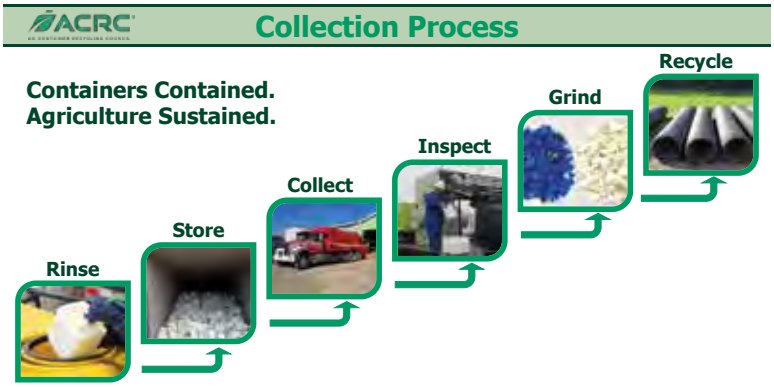
ACRC announces a new second contractor in California

The Ag Container Recycling Council (ACRC) named a second contractor for ACRC collection and recycling service in the state of California. Ag Plastic Recycling started providing services in California in the fourth quarter of 2023.

Ag Plastic Recycling, along with ACRC's existing contractor, Interstate Ag Plastics, will continue to provide collection and recycling services in California. 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 (7), which will be covered solely by Ag Plastic Recycling: Colusa, Lake, Napa, Sonoma, Sutter, Yolo, and Yuba.
- The following eighteen (18) 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.

Contact information for both contractors can be found at https://agrecycling.org/recycling/collection-sites/ ■



The ACRC is a not-for-profit 501(c)(6) trade association that works to facilitate the collection and recycling of one-way rigid HDPE plastic agricultural crop protection, animal health, specialty pest control, micronutrient, biologicals, fertilizer, and/or adjuvant product containers. This is done through member funding of cost-effective programs that foster public health and safety, environmental protection, resource conservation and end-user convenience.

The ACRC is fully funded by our member companies and affiliates that formulate, produce, package, and distribute crop protection and other pesticide products. If you have any related questions, please visit https://agrecycling.org/ or contact ACRC Executive Director, Mark Hudson, at mhudson@agrecycling.org.

Featured Article

Working together to overcome challenges in citrus

Casey Creamer, California Citrus Mutual President/CEO

California citrus growers produce 90 percent of the fresh citrus grown domestically on roughly 250,000 bearing acres of oranges, mandarins, lemons, grapefruit, and specialty varieties. California Citrus Mutual (CCM) is a voluntary, non-profit trade association that works to protect the interests of citrus growers to ensure the viability of the industry for future generations, a task that has proven difficult but successful in our 46 years of service to the industry.

Like all agriculture in California, citrus is under a tremendous amount of pressure due to inflation, dwindling to nonexistent returns, and the constant evolution of rules and regulations that make it increasingly more difficult to farm in the Golden State.

Then there's the added threat of pests and diseases such as huanglongbing (HLB), thrips and fruit flies. Just this year, we saw a new HLB quarantine go into effect in Ventura County – a major citrus-producing region – and significant thrips damage in the valley causing exterior fruit scarring. Most concerning of all is the unprecedented fruit fly situation, especially for those growing citrus within the quarantine areas. Due to the large number of hosts, stringent mitigation regulations, and the seemingly weekly increase in quarantine areas, we are very concerned about the impact fruit flies could have on our industry.

Another area of constant concern for our growers is, of course, water. Implementation of the Sustainable Groundwater Management Act (SGMA) is well underway, and even with the wet winter we saw last year, water remains a top issue for growers. This is perhaps the area where growers have had to adapt the most; and until the state invests in more meaningful water storage solutions, growers will be forced to idle some of the most productive farmland in the world.

However, even with all these challenges, we remain positive about the sustainability of the California citrus industry. Why? Because our industry has overcome challenges before.

For example, when we were first hit with high tariffs during the trade war and citrus exports to China saw some of the highest additional tariffs of any commodity, we worked with our representatives in Congress and the United States Trade Representative (USTR) to negotiate the reduction of the retaliatory tariffs. And while we haven't fully recovered yet we have reduced tariffs and regained a good portion of the market share.

We also must remember that we were hit with COVID-19 in the middle of our peak harvest season. Rules and regulations changed without notice to ensure worker and consumer safety, but we still were able to successfully grow, pick and pack fruit and keep grocery stores supplied with healthy citrus. COVID-19 also kick-started the supply chain crisis. We had difficulty moving fruit through our traditional channels but were able to find others and keep the industry afloat while others struggled.

Our ability to overcome these challenges gives me confidence that we will overcome the trials we face today. Identifying top issues, putting the right people in rooms together, and coming up with pragmatic solutions is and will continue to be our strategy moving forward.

We also must not forget the value of our trusted industry partners. As PCAs, you play a crucial role in providing

California CITRUS MUTUAL

guidance to deal with emerging pest threats and the regulatory dynamics of pesticide application. We know what you do isn't easy, and we appreciate your expertise on pesticides while also protecting the workforce, neighbors, and the environment. Our partnership is even more important now as the state works to implement the Sustainable Pest Management Road Map.

Pesticides are under scrutiny more than ever. This has shown true with the loss of chlorpyrifos, the new regulations around neonicotinoids to protect pollinators, and the upcoming Priority Pesticide Program that the state is looking to implement.

To be successful, we as an industry are going to have to work in a coordinated and strategic fashion to understand the risks, motivations, and desired outcomes in a way that protects California agriculture interests. The common ground between citrus growers, the Department of Pesticide Regulation (DPR), and communities concerned about pesticides is that no one wants to spray pesticides more than what is necessary.

Growers and PCAs have to identify what the state and federal governments can do to provide carrots and not just sticks. We must maintain a strong relationship with county agriculture commissioners and DPR if we are going to convince legislators and the general public that pesticides can be used safely. None of this will happen overnight or be easy. There will be many times we feel we are defeated, unheard, and want to give up. But to protect our industry, we must keep listening, learning, and working. Persistence is what has made us successful in the past and it is what will continue to make us sustainable in the future.

The Natural Chemistry Lab
Part II

by Galynn Beer, National Strategy & Product Management Lead

The December 2023 issue of the CAPCA *Adviser* contained the first of a two-part article series regarding the complexities of soil. The first article talked about what is needed to maximize the productive capacity of that asset. First, a quick review of part one: the nutrient holding capacity of the soil indicated on a soil test as Cation Exchange Capacity (CEC, highlighted in blue). Also, some key cations comprise most of the holding capacity of the soil. The main cations are listed as percentages of base saturation. Calcium (Ca) should be around 70%. Once that number starts getting higher than 75%, then it can have some negative impact on other nutrients (reference the green ovals on this soil test analysis to see the impact of high Ca). Magnesium (Mg) should be around 15%. Potassium (K) would be optimum at about 5%, sodium (Na) should be less than 2% and hydrogen (H) about 10-15%. They should total 100%. Hydrogen is the ion that causes acidity, so the more of it you have, the more acidic your soil will be (the orange highlights on this report demonstrate that having a hydrogen base saturation of zero results in basic pH, which is a pH>7). In high pH soils, you may need to add elemental sulfur to remove some of the cations. Good crop production can be obtained on less than an optimum balance of these cations, but numbers in the ranges given will help crops endure stresses of the growing season.

With that overview, you can see that when looking at a soil test, many relationships exist among nutrients, and you shouldn't just evaluate each nutrient on its own or address it according to the number listed. In the example shown, you'd be tempted to look at the weak bray phosphorus (P1) test and apply a very high amount of phosphorus. But if that phosphorus is broadcast, the excess Ca represented by the 84.2% is just going to tie it

SOIL ANALYSIS REPORT

LAB NUMBER *263*	SAMPLE IDENTIFICATION	ORGANIC MATTER LOI percent	RATE	PHOSPHORUS P_1 (WEAK BRAY) 1:7 ppm	RATE	PHOSPHORUS P_2 (STRONG BRAY) 1:7 ppm	RATE	OLSEN BICARBONATE P ppm	RATE	POTASSIUM K ppm	RATE	MAGNESIUM Mg ppm	RATE	CALCIUM Ca ppm	RATE	SODIUM Na ppm	RATE	pH SOIL pH 1:1	BUFFER INDEX	CATION EXCHANGE CAPACITY C.E.C. meq/100g	PERCENT BASE SATURATION (COMPUTED) % K	% Mg	% Ca	% H	% Na
05718	B-3	1.3	VL	23	H	61	VH			128	M	303	VH	1923	H	97	H	7.7		12.9	2.5	19.6	74.6	0.0	3.3
05719	A-14	0.5	VL	66	VH	91	VH			113	M	172	VH	1200	H	42		7.8		7.9	3.7	18.1	75.9	0.0	2.3
05720	A-3	1.3	VL	20	M	79	VH	13	M	212	H	511	VH	3209	H	160	VH	7.9		21.5	2.5	19.8	74.5	0.0	3.2
05721	B-11	0.8	VL	31	VH	62	VH			135	H	210	VH	1128	H	34		7.4		7.9	4.4	22.2	71.5	0.0	1.9
05722	A-12	1.3	VL	21	M	36	M			195	VH	210	VH	1307	H	81	H	6.9		9.1	5.5	19.2	71.4	0.0	3.9
05723	A-2	1.3	VL	3	VL	67	VH	12	M	194	H	512	VH	3227	H	165	VH	8.1		21.6	2.3	19.8	74.6	0.0	3.3
05724	B-15	1.2	VL	27	H	66	VH			128	M	251	VH	2119	H	90	H	7.7		13.4	2.4	15.6	79.1	0.0	2.9
05725	A-1	1.4	VL	61	VH	103	VH			211	H	504	VH	3227	H	100	M	7.8		21.3	2.5	19.7	75.8	0.0	2.0
05726	B4N	1.0	VL	28	H	111	VH			181	H	400	VH	2874	H	86	M	7.9		18.5	2.5	18.0	77.5	0.0	2.0
05727	E-3	1.1	VL	43	VH	55	H			181	VH	310	VH	1558	H	49		7.4		11.1	4.2	23.3	70.6	0.0	1.9

LAB NUMBER *263*	NITRATE-N (FIA) SURFACE ppm	SURFACE lbs/A	SURFACE depth (in)	SUBSOIL 1 ppm	SUBSOIL 1 lbs/A	SUBSOIL 1 depth (in)	SUBSOIL 2 ppm	SUBSOIL 2 lbs/A	SUBSOIL 2 depth (in)	Total lbs/A	SULFUR S (CAP) ppm	RATE	ZINC Zn (DTPA) ppm	RATE	MANGANESE Mn (DTPA) ppm	RATE	IRON Fe (DTPA) ppm	RATE	COPPER Cu (DTPA) ppm	RATE	BORON B (HOT WATER) ppm	RATE	EXCESS LIME RATE	SOLUBLE SALTS 1:1 mmhos/cm	RATE
05718	10	18	0-6							18	15	M	3.0	M	2	VL	5	VL	0.3	VL	0.7	L	L	0.4	L
05719	8	14	0-6							14	18	M	2.8	M	1	VL	3	VL	0.4	L	0.5	L	L	0.2	L
05720	20	36	0-6							36	31	VH	3.0	M	3	VL	28	VH	0.6	L	1.0	M	L	0.6	L
05721	14	25	0-6							25	12	L	3.6	H	1	VL	5	VL	0.4	L	0.5	L	L	0.2	L
05722	15	27	0-6							27	152	VH	1.4	M	2	VL	8	L	0.3	VL	0.5	L	L	0.9	L
05723	13	23	0-6							23	45	VH	2.3	M	3	VL	15	M	0.6	L	1.2	M	M	0.7	L
05724	20	36	0-6							36	18	M	2.8	M	1	VL	5	VL	0.4	L	0.7	L	L	0.5	L
05725	28	50	0-6							50	33	VH	4.5	H	4	VL	12	M	0.9	M	1.1	M	L	0.6	L
05726	6	11	0-6							11	25	VH	3.5	H	2	VL	9	L	0.6	L	0.8	M	L	0.4	L
05727	13	23	0-6							23	35	VH	2.9	M	2	VL	7	L	0.4	L	0.6	L	L	0.4	L

up, rendering it unusable by the crop you intend to feed. So when you are thinking about fertilizing your crop, you need to stay focused on what the crop will be able to use and not what you are applying to the soil. Much of the phosphorus that is in the soil on the test with the high Ca will never be used by the crop. The calcium-phosphorus bond is too strong for the plant to be able to extract the phosphorus from the calcium. This just illustrates one of many possible reactions that can limit the ability of a crop to utilize nutrients in the soil. Over time, some of the phosphorus will separate when Mother Nature provides rain and a fractional amount will be released.

Micronutrients

At the bottom of the test shown, the micronutrient levels are listed. It is common to think that soils either have them or they don't. Certainly, there is some truth to that. Soils in some areas of the country are naturally high in specific nutrients. But also impacting micronutrient levels significantly is the balance of the soil. High levels of Ca, Mg, K and Na can crowd out micros. Often, zinc, manganese, and iron are the most common to have limited availability with excesses of cations. This can easily be seen when crops with a high demand for these micronutrients are grown on these soils. Citrus is a crop that demands a lot of iron and manganese and would suffer in this soil.

Prioritizing Your Fertilizer Dollars

The valuable part of a soil test, the reason you should routinely have your soil analyzed, is that this overview will help you prioritize investments into your asset of land. The overall soil test can help tremendously with making these decisions. Decisions regarding crop nutrition can be complex as yield expectations rise and economics remain challenging. The purpose of using fertilizer is to feed the crop. Thinking about fertilizer in terms of how much is used by the plant rather than how much is applied to the soil is a critical step. A complete soil test is a good indicator of how much efficiency can be expected with applied crop nutrition.

Fertilizer investments should begin with a soil test; they should end with a decision to get the most value out of your fertilizer dollar by adding skilled interpretation of the test with protected nutrition. A skilled crop nutrition expert or an agronomist with an understanding of nutrient interactions in the soil can help you navigate your soil test analysis and create an efficient and economical crop nutrition plan for your crop. ■

Featured Article

Insect trap hanging in a citrus tree.
Traps are used to monitor for invasive species.

The California Department of Food and Agriculture

An overview for Pest Control Advisers

Kevi Mace, Ph.D., Senior Environmental Scientist, California Department of Food and Agriculture
Benjamin Lee, Ph.D., Senior Environmental Scientist, California Department of Food and Agriculture

The California Department of Food and Agriculture (CDFA) is the agency responsible for ensuring the state's food safety, protecting the state's agriculture from invasive species, and promoting the California agricultural industry. With just over 2,000 people across 32 locations in the state, CDFA is a relatively small agency but contains a broad array of critical programs to support California's agricultural industry and consumers around the world. Our programs are aimed at preventing and managing pests and diseases, ensuring strong and fair markets and the safety and quality of agricultural products, and supporting the research and infrastructure that our stakeholders need to combat new and existing threats to production.

CDFA is working jointly with the California Department of Pesticide Regulation (CDPR) on achieving the goals set out in the Sustainable Pest Management Roadmap (SPM) through our existing pest prevention programs and new initiatives. New invasive species disrupt current pest management practices and often lead to increased use of broad-spectrum pesticides, which can cause resistance, loss of natural enemies, and increased costs for growers. Focusing on excluding exotic pests is a key component of the SPM Roadmap, with the goal of reducing damage to crops, preventing non-target effects on the environment and the public, and ensuring that growers and pest control advisors continue to have effective management options available. Exclusion is even more essential as changes in California's climate allow for new species to expand their range and establish in the state. PCAs likely are familiar with some of the programs run by CDFA's Plant Health and Pest Prevention Services Division, which include the Border Protections Stations (BPS), invasive species detection and establishment of quarantine zones, and long-term management programs for economically important pests like Navel Orangeworm (NOW) and Beet Curly Top Virus (BCTV) through the Integrated Pest Control Branch (IPC). More in-depth coverage of a selection of their activities will be covered in future articles. CDFA also contains divisions devoted to specific, critical threats to agriculture. The Citrus Pest and Disease Prevention Division (CPDPD) strives to protect California citrus from invasive pests and diseases, including the Asian citrus psyllid and huanglongbing (Citrus Greening), through the development and implementation of effective policies and regulations. The Pierce's Disease Control Program (PDCP) aims to slow the spread of the glassy-winged sharpshooter and minimize the impact of Pierce's disease in California vineyards. By keeping the number of invasive pests at a minimum, CDFA works to give California farmers and ranchers the best chance at practicing SPM.

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A tomato truck stopped at an inspection station. Keeping invasive pests out of the state is a key focus of CDFA.

Beyond pest and disease prevention, CDFA includes several groups ensuring that consumers receive safe and quality agricultural products and that producers are supported by fair and equitable markets. The Inspection Services Division (ISD) provides a variety of services related to proper labeling. They inspect fruit, vegetables, and nuts to ensure correct grade, ensure animal feed and medicines are safe and effective, monitor egg production and marketing, and perform audits to verify safe handling across the food chain. This division also houses the California Organic Program, which is responsible for enforcing the Organic Foods Production Act of 1990 and the California Organic Products Act of 2003. Animal Health and Food Safety Services (AHFSS) provides services related to ensuring food safety, protecting livestock and poultry, and assisting farmers and ranchers with losses from theft or disease.

California proudly produces more than 400 different crops, and CDFA strives to assist producers in fairly and responsibly promoting their agricultural products to state, national, and international markets. The Division of Marketing Services assures producers are paid for their products, collects, and distributes information on marketing and economics, and provides mediation for issues between producers and handlers. The Division of Measurement Standards (DMS) works with counties to verify the quantity of packaged and bulk commodities, verify labeling, enforce quality standards, and ensure the accuracy of commercial measuring and weighing devices. And finally, working to showcase California's agricultural heritage, the Division of Fairs and Expositions (F&E) provides financial and policy oversight to California's network of 78 fairs throughout the state.

With a range of emerging threats to agriculture in California, growers will always need new tools and technologies to stay competitive. CDFA maintains several programs to provide critical infrastructure to producers and to support research ensuring California agriculture can adapt to changing climate and pest pressures. CDFA's Executive Office houses the Secretary of Agriculture, executive staff, and the Office of Environmental Farming and Innovation (OEFI), which administers the Climate Smart Agriculture (CSA) incentive programs. These include the Healthy Soils Program (HSP) and State Water Efficiency Enhancement Program (SWEEP), which provide funding to producers to develop healthy soil and install efficient irrigation systems. CDFA also runs the Specialty Crop Block Grant Program (SCBGP), which conducts an annual competitive solicitation process to fund projects that enhance the competitiveness of California specialty crops. Within OEFI, the Office of Pesticide Consultation and Analysis (OPCA) administers the Biologically Integrated Farming Systems (BIFS) and Proactive IPM programs to develop and promote SPM practices combatting existing and emergent pest problems. These programs support California growers' roles as efficient producers of food and stewards of the environment.

CDFA's mission is to serve the citizens of California by promoting and protecting a safe, healthy food supply, and enhancing local and global agricultural trade, through efficient management, innovation, and sound science, with a commitment to environmental stewardship. In line with this commitment, CDFA is always interested in hearing from our stakeholders and the public. The California State Board of Food and Agriculture conducts public meetings on all matters concerning agriculture and food policy. Information about upcoming meetings may be found at *https://www.cdfa.ca.gov/State_Board/*. Additional public meetings for specific CDFA divisions can be found at *https://www.cdfa.ca.gov/Meetings.html*. ■

Featured Article

Fusarium yellows in celery: identification and management

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INTRODUCTION

Fusarium yellows caused by *Fusarium oxysporum* f. sp. *apii (Foa)* has been a persistent problem for coastal celery growers. This fungus survives in soil for many years and can be moved with infested plants and soil. Multiple races of the pathogen exist on the Central Coast.

Foa race 2 has been present for more than 50 years in all regions of the state where celery is grown. It typically causes yellowing and stunting of established plants. The water-conducting tissue (xylem) in the stem, crown, and roots shows a characteristic orange-brown discoloration, and plants fail to produce marketable heads.

Foa race 4 appeared in Ventura County in 2013 and by 2022 had displaced race 2 as the predominant race causing celery losses in Ventura County. Recently, the presence of this race was confirmed in Monterey County. Race 4 is more aggressive than race 2 and can cause plant stunting and death within weeks after planting, particularly if soil temperature is 70°F or higher.

Both *Foa* race 2 and race 4 have been shown to infect cilantro, but race 4 is the more aggressive of the two and can cause decline and significant yield loses. This is particularly troublesome since celery and cilantro often have been grown in rotation in the same fields. Additionally, another strain of Fusarium exists called *F. oxysporum* f. sp. *coriandrii*, which only causes disease in cilantro, not celery. Thus, identifying the pathogen correctly is very important in cilantro rotations with celery.

FIG. 1: When crowns of infested and stunted plants are sliced open, discoloration due to Fusarium colonization is often observed (right). A crown of uninfested celery is on the left.

MANAGEMENT

Prevention and Sanitation

Prevention and sanitation are key to avoiding or slowing the spread of the pathogen from infested fields to new areas, as there are no cost-effective soil treatments to manage Fusarium. The simplest sanitation measure is to remove soil from equipment, shoes, or anything carrying soil before leaving the infested field or ranch. At least a one percent solution of quaternary ammonium should be used to spray surfaces after soil and plant debris have been knocked off, per the recommendation of UC ANR Plant Pathologist Cassandra Swett. Disposable boot covers can be used to prevent pathogen movement with infested soil on footwear.

Breeding for Disease Resistance

Planting resistant varieties is the best method of control. Efforts to breed celery cultivars with resistance to races 2 and 4 have been a priority for the celery industry since the diseases were first described. The California Celery Research Advisory Board has been supporting these efforts and germplasm evaluations in infested fields.

Celeriac and cutting celery contain a source of resistance for both race 2 and race 4, and public and private breeding programs have been working to integrate stacked race 2 and race 4 resistance into commercial varieties. There are many cultivars with resistance and tolerance to race 2, but fewer with resistance or tolerance to race 4. In 2022, UC Davis released four lines with stacked resistance to both races. Fifty seeds of each of these lines are available by Material Transfer Agreement with the USDA-ARS to interested breeders for germplasm development. The selection process also takes into consideration agronomic characteristics and suitability of developed lines as parents in continued breeding to meet the commercial quality standards. The UC Davis lines contain some individuals with morphology that is more consistent with cutting celery than commercial celery, but nonetheless are useful as breeding lines.

2022-23 CELERY GERMPLASM EVALUATIONS

We have evaluated cultivars and breeding lines from private companies and germplasm collections such as USDA, Seed Saver's Exchange Ltd, and University of California at two locations with known infestations of *Foa* race 2 (Santa Maria) and race 4 (Camarillo). In replicated trials, we assessed plant mortality and recorded soil temperature during the growing season. At harvest, we scored the severity of Fusarium infection from 0 (no visible symptoms) to 5 (severe crown discoloration). We also recorded petiole lengths, weights, and scored petioles for greenness, cracking, bolting, ribbiness, pithiness, and suckering.

FIG. 2. *Fusarium oxysporum* f. sp. *apii* race 2 causes stunting in *Tall Utah* (left) at Santa Maria, and race 4 causes mortality of *Challenger* (right) at Camarillo in summer.

Results

At Santa Maria in 2022, there was no plant mortality, but susceptible entries had Fusarium symptoms in roots and crowns, and infection scores ranged 2.0-3.6. Many entries did not produce marketable celery. The celery entries most resistant to race 2 had Fusarium infection scores of 0.1-0.7. These resistant celery entries tended to produce the heaviest stalks with longest petioles (Table 1).

At Camarillo in 2022, air temperatures during the two weeks after planting were 75-80°F, which likely promoted rapid disease development of *Foa* race 4 and drastic early decline in susceptible celery. At six weeks after planting, 23 of 42 entrees had 80-100 percent plant mortality. However, five entries had a Fusarium score of 1.0-1.5 and less than 15 percent mortality. These lines produced marketable celery stalks (Table 2).

In 2023 we are continuing to evaluate celery cultivars and breeding lines at the same infested field sites in Santa Maria and Camarillo. This year's trial included recent selections with fixed resistance to *Foa* race 4 from the University of California program alongside the promising proprietary celery selections. ■

SUMMARY FOR FUSARIUM MANAGEMENT

- Practice sanitation.
- Identify pathogen races in symptomatic crop.
- Use resistant cultivars to race 2 if that race has been identified.
- If race 4 is present in celery, avoid planting celery or rotation with cilantro.
- Avoid planting in warm soils when pathogen has been confirmed in the field (especially in the case of race 4).
- When possible, rotate with fumigated crops such as strawberry.
- Visit field days that show differential celery resistance to *Foa* races. Contact the California Celery Research Advisory Board or one of the authors for locations and times of the field days.

TABLE 1. Top ten celery entries with lowest infection scores to *Fusarium oxysporum* f. sp. *apii* race 2 and desirable stalk weight and petiole length at Santa Maria, CA, 2022.

Rank	Fusarium score (lowest)	Stalk weight (heaviest)	Petiole length (longest)
1	RZ2005	RZ2001	RZ2005
2	TZ4	Stix	Wild Irish
3	Merengo	TZ6	Zwolsche Krul
4	Fandango	Merengo	Celeri a Couper
5	RZ2008	TZ2	RZ2001
6	TZ5	Fandango	Stix
7	Celeri a Couper	TZ4	RZ2008
8	Wild Irish	Celx767	TZ2
9	RZ2001	RZ2005	TZ4
10	Stix	Wild Irish	TZ6

TABLE 2. Top ten celery lines in survivorship in *Fusarium oxysporum* f. sp. *apii* race 4 infested soil, with lowest infection scores and desirable stalk weight and petiole length at Camarillo, CA, 2022.

Rank	Survivorship (lowest mortality)	Fusarium score (lowest)	Stalk weight (heaviest)	Petiole length (longest)
1	TZ 5	RZ 4007	BJF 8	RZ 4005
2	RZ 4005	Earthrace	RZ 4002	Earthrace
3	French Dinant	RZ 4009	BJF 12	RZ 4010
4	BJF 10	TZ 4	RZ 4005	French Dinant
5	BJF 11	RZ 4006	Earthrace	RZ 4002
6	RZ 4009	RZ 4002	RZ 4006	RZ 4007
7	RZ 4007	RZ 4005	TZ 1	BJF 12
8	Earthrace	BJF 12	RZ 4008	BJF 10
9	TZ 2	French Dinant	TZ 4	RZ 4004
10	TZ 3	BJF13, TZ 5	BJF 9	TZ 4

Featured Article

Potential of insect pathogens in reducing walnut husk fly population in walnut orchards

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Background

Walnut husk fly (WHF), *Rhagoletis completa* Cresson (Diptera: Tephritidae), is one of the economically damaging pests of walnuts and has a one-year life cycle. Adults emerge from the soil during the summer. After mating, females lay eggs inside the developing hull. The recently hatched larvae begin to feed on green husks and pass through three larval stages (i.e., instars) before they drop into the soil for pupation. The larval feeding on the husk results in shriveling/darkening of the kernels or makes the hulling process difficult. Walnut husk flies attack all major walnut cultivars grown in California; however, susceptibility depends on several factors, such as fruit size and maturity time.

Current husk fly control in California is primarily based on multiple applications of synthetic insecticides during the adult emergence season targeting the adult WHF. This approach is not compatible with an effective IPM program. It has several issues, such as increased cost of production, increased risk of secondary or resurgence of other pests, and ultimately ruins the sustainable pest management approach. Therefore, our project aimed to explore entomopathogens as a potential option to reduce the walnut husk fly population in the orchard and explore an IPM-friendly approach to walnut husk fly management.

Between 2021 and 2023, we conducted several laboratory and small- and big-plot field trials to evaluate the efficacy of the entomopathogenic fungus *Beauveria bassiana* and three species of nematodes—*Heterorhabditis bacteriophora* (HB), *Steinernema feltiae* (SF), and *Steinernema carpocapsae* (SC)—in different combinations.

Laboratory Experiment

In our laboratory test, we used the entomopathogenic fungus and two species of nematodes individually or in combination. The five treatments were:

1) an entomopathogenic fungus, *Beauveria bassiana*,
2) a nematode, *Heterorhabditis bacteriophora* (HB),
3) a nematode, *Steinernema feltiae* (SF),
4) a combination of HB and SF (HB+SF), and
5) the untreated control.

Soil was collected from a walnut orchard, adjusted to 15 percent moisture, and placed in small plastic cups after applying the appropriate treatment. Walnut husk fly larvae collected from infested nuts were exposed to the treated soil in the containers (Figure 1) and evaluated for larval mortality weekly for three weeks. Treatments were replicated five times (i.e., five containers). The larval mortalities among treatments were analyzed with One-Way ANOVA. The study showed that two nematode

Entomopathogenic nematodes infect a *Galleria* larvae. Thousands of nematodes are coming out from the insect body. Credit: Jhalendra Rijal, UC IPM.

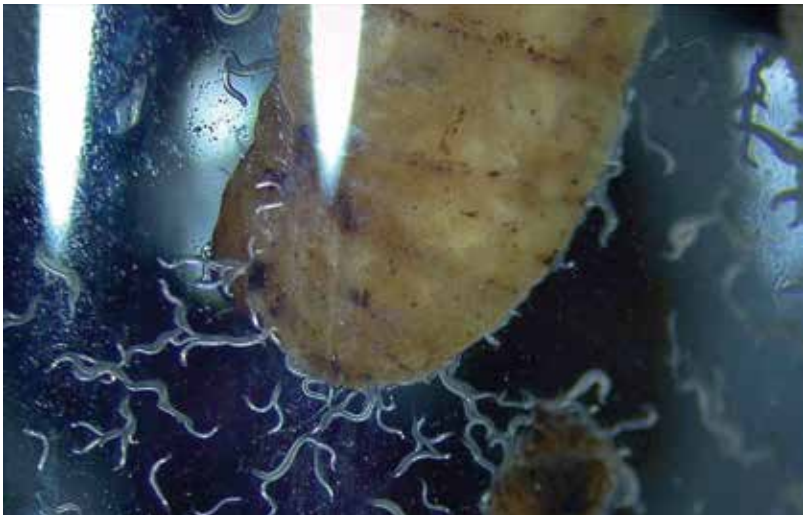


FIG. 1. Laboratory experiment set up for entomopathogens efficacy test. Credit: Jhalendra Rijal, UC IPM.

species, *Heterorhabditis bacteriophora* (HB) and *Steinernema feltiae* (SF), individually caused significantly higher mortality of walnut husk fly larvae (about 30 percent mortality in SF) compared to the untreated control and entomopathogenic fungus treatments (Figure 2).

Small-plot Experiment

In the fall of 2021, we conducted a small-plot (10 x 20 ft.) study in a walnut orchard with a heavy walnut husk fly population using a replicated trial (eight replications). We evaluated the performance of the entomopathogenic fungus (*Beauveria bassiana*) and the combination of three nematode species (HB+SF+SC) as a combination treatment (Combo).

First, we tested the persistence of entomopathogens in the soil. For this, we collected soil samples from these treated plots and exposed the susceptible test insect larvae, *Galleria mellonella*, to the soil to evaluate the persistence of the applied entomopathogens four weeks after the application in the soil. We found that about 58 percent of the *Galleria* larvae died in the soil treated with the fungus compared to 16 percent in the untreated control treatment (Figure 3). The Combo treatment killed about 38 percent of the larvae exposed.

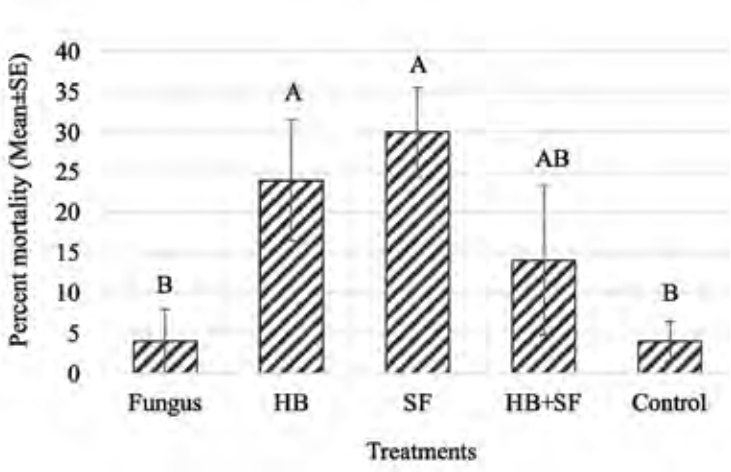


FIG. 2. Efficacy of entomopathogens causing walnut husk fly mortality in a laboratory test using walnut orchard soil as a substrate. Means with the same letter are not statistically different at P<0.05. Fungus=entomopathogenic fungus, *Beauveria bassiana*; HB=nematode, *Heterorhabditis bacteriophora*; SF=nematode *Steinernema feltiae*; Control=untreated control; SE=standard error

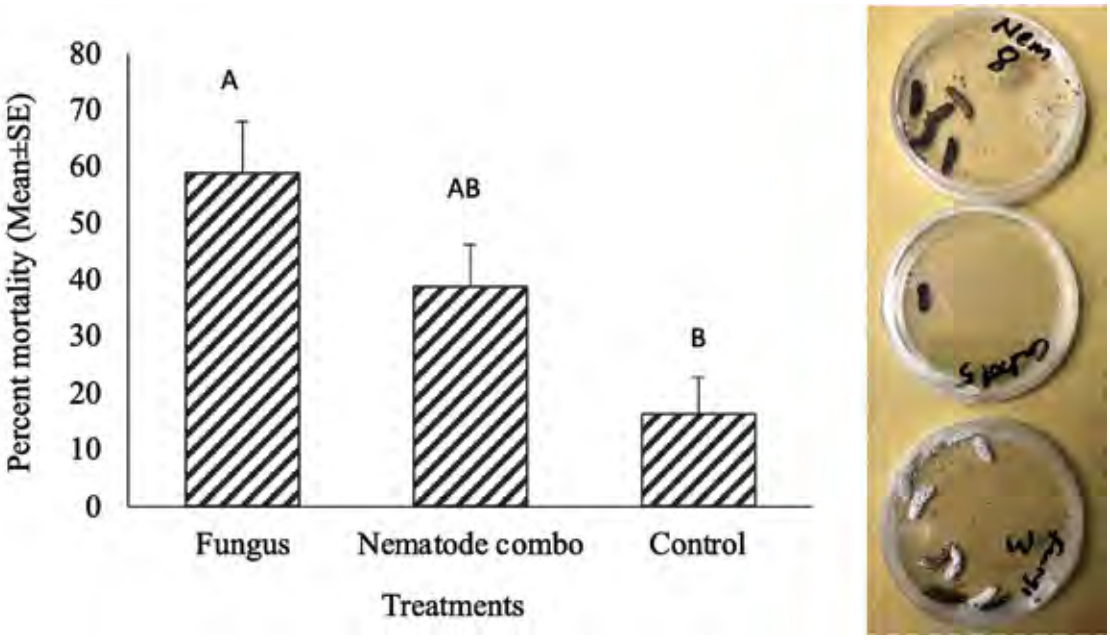


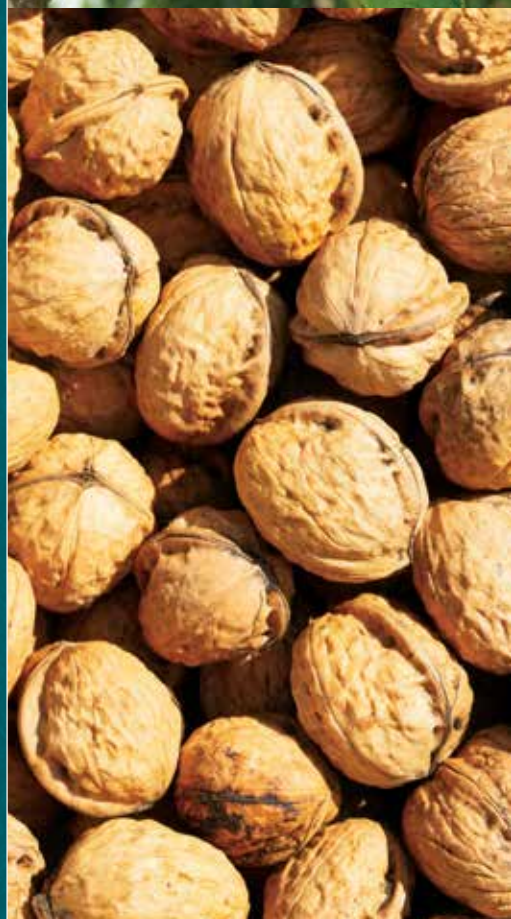
FIG. 3. Insect pathogens persistence study using greater wax moth mortality in a laboratory test. Means with the same letter are not statistically different at P<0.05. Credit: Jhalendra Rijal, UC IPM. Fungus=entomopathogenic fungus, *Beauveria bassiana*; Nematode combo=nematodes, *Heterorhabditis bacteriophora*, *Steinernema feltiae*, and *Steinernema carpocapsae*; Control=untreated control; SE=standard error

Second, we looked at the impacts of these entomopathogens in attacking the walnut husk fly larvae in the fall when they drop from the tree to the ground for pupation, and that ultimately reduces the husk fly adults' emergence the following summer. For the evaluation, we installed one-foot diameter cages in the soil (Figure 4) and recorded the adults that emerged from the ground by trapping them as they emerged. In this study, we found about a 16 percent reduction over the untreated control in the adult population that emerged from plots treated with the entomopathogenic fungus compared to the untreated plots. No adult population reduction was observed in the nematode-treated plots. We believe the surface area of the emergence cages we used was too small (less than one percent of the plot area) to observe a difference. It also could be that treating one time in the fall may not be enough to make a difference for next year's adult emergence.

Field Experiment

To address the small-plot experiment bottleneck, we conducted another experiment by treating the field plots (about 1.5 acres each) in fall 2022, targeting the larvae, and again in summer 2023, targeting emerging adults. Treatments were a combination of two nematode species (HB+SF), *Beauveria bassiana*, and an untreated control. Treatments were replicated three times. Around

FIG. 4. Installation of walnut husk fly emergence cages in the walnut orchard. Credit: Jhalendra Rijal, UC IPM.



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the center of the plot, we installed seven yellow sticky traps baited with an ammonium bicarbonate lure and recorded husk fly adult captures from mid-July through September to determine the adult capture difference among treated plots. The seasonal average number of WHF adults was the lowest in the nematode treatment (14.6 adults/plot), followed by *Beauveria bassiana* (16.0 adults/plot), and the untreated control (20.7 adults/plot). Compared to the untreated control, adult captures were reduced by 29 percent in the HB+SF nematode treatment and 22.6 percent in fungus treatment (Figure 5).

Summary

Although further studies are needed to look at several aspects of survival and potential long-term husk fly population reduction, entomopathogenic nematodes have shown good promise to reduce walnut husk fly populations in walnut orchards. Biological control agents may establish and act slowly, and the results may not be obvious in one or two years of study; a long-term look at a particular orchard with these types of products is necessary due to variability likely influenced by environmental and orchard management-related factors. ■

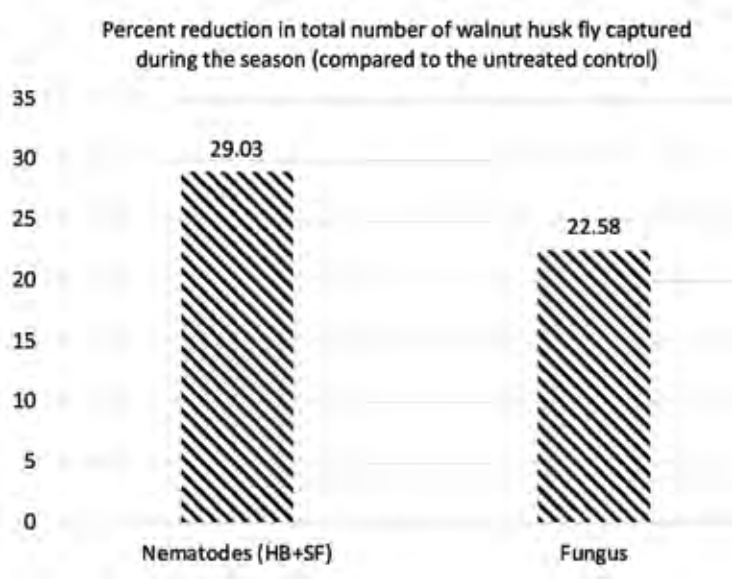

FIG. 5. Walnut husk fly adult population reduction (compared to the untreated control) in orchard blocks treated with entomopathogenic nematodes and fungus. Fungus=entomopathogenic fungus, *Beauveria bassiana*; HB=nematode, *Heterorhabditis bacteriophora*; SF=nematode *Steinernema feltiae*

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