CAPCA ADVISER

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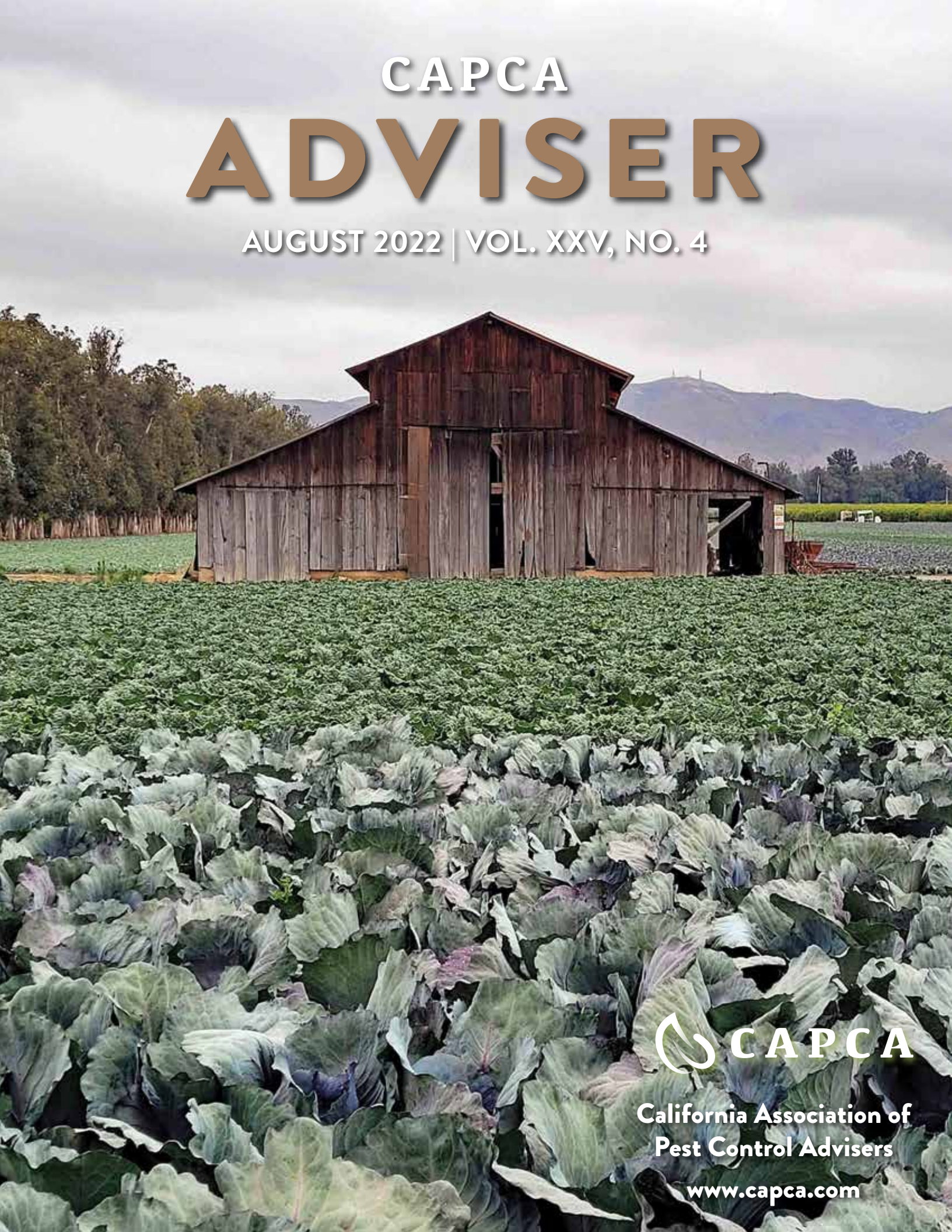

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Your Renewal Information is a Matter of Public Record

Rolling off the release of personal data for California concealed carry permit holders by the California Attorney General, discussions have sparked around the line between public record and disclosure of personal information. These discussions aligned with a weeklong series of heated workshops held on statewide notifications by CDPR. The workshop chat feed read like the comment section of a salacious gossip site – group think and trolling in full force. It was downright toxic and led many ag stakeholders to believe their voice could not be heard through the noise but that their own personal information was about to be similarly compromised at the hands of activists. Activists who would drop tidbits of personal information about anyone that opposed them in the chat feed in an attempt to extinguish their target. This personal information could have easily included residential or work addresses available with a quick search of licensees on the DPR website.

Whether you already have your renewal packet in hand to renew this year or this is simply a reminder to submit an address change, I would encourage each member to consider the public record of your CDPR license information with includes your address of record with DPR.

In discussion with CAPCA leadership and as a part of your CAPCA dues at work, CAPCA is pursing the removal of your (unnecessary) personal information on the CDPR website.

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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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The Myriad Benefits of CAPCA Service

By Patrick Dosier

My "career" as an active CAPCA Member began ten years ago when elected President of the SF Bay Chapter. After relocating to Sacramento, it continued as I became the Woodland Chapter's representative on CAPCA's Board of Directors in 2014. Since that time, I have served on the Board in multiple capacities: on the CAPCA Forward Committee, as the Almond Crop Team Champion, as Government Relations Co-Chair, on the CECPM Board, as the Student Networking Event Moderator, as Treasurer, and as Chair. In the twilight of my term as Chair, it's a good time to look back at all the benefits that this service has provided me.

Build a Broad Network of Trusted People - An obvious benefit is the network of people I have had the pleasure to work with. We tend to get siloed in this industry. Distribution relationships, vast geographies, crop type, and nose-to-the-grindstone focus are all reasons it is difficult to network across California. CAPCA service has enabled me to develop meaningful relationships with PCAs from the Salton Sea to the Klamath Basin. We work with arborists in the Bay Area, ornamentals in San Diego, manufacturers' representatives, retail PCAs and independent PCAs. I am confident that if my career ever depends on me tapping an extensive network, I'll have CAPCA to thank. Additionally, I have had the pleasure of working with individuals who are customers in our "day jobs." By working side-by-side with them on CAPCA projects, we have circumvented the implicit "buy-sell" dynamic and have built strong relationships. I argue that we arrived at this elevated level of trust *faster* because of our CAPCA involvement.

CAPCA is a Great Place to Fail – okay, okay, clickbait sub-header aside – CAPCA allows active Members to gain experience. For most of us, we are held accountable for the outcomes of our daily work. This makes sense for our profession, but it does not foster a great degree of innovation nor risk-taking. CAPCA is all about trying out new ideas. Gerald Martin and Mike Ansolabehere had the vision to create our Reinvestment Fund, to which Members can submit their ideas for creating Member value. This is a great opportunity for you to shepherd an idea to fruition. This is an active program today, so check it out!

A selection of my personal experiences come to mind. I was one of the leaders of the pilot crop team. We eagerly recruited industry leaders, created a vision, and kicked off the initiative. However, we failed to gather the organization's buy-in along the way. This project ultimately failed and taught me an important lesson about building consensus within organizations.

Through CAPCA, I was able to work with more women than I would have otherwise. These experiences demonstrated how sexism is still very real in our industry. Women are held to all sorts of different standards, and they risk retaliation if they speak out about it. Before CAPCA, I was oblivious to the complexity, and the pain, that this entails. That's why I am excited that CAPCA is quietly working on a Women's Ag Leadership Program in conjunction with some Sustaining Members.

I was able to witness CAPCA navigate several crises during my time on the Board. The transition from Terry Stark's tenure as CEO was not ideal. As a Board Member, I was able to closely observe as the Executive Committee dealt with this transition and delighted that they ultimately offered the CEO position to Ruthann. Again, if you're early in your career, how often do you have the opportunity to manage an executive transition?

The pandemic gave us all a little of that *hard-earned* experience one way or another. But, as a Member of the Executive Committee, I was challenged to contribute to dozens of difficult decisions, many with significant consequences. We were exposed to contract law, health codes, liability discussions, and we had to decide how to make the most of it. As a Member of the Executive Committee, you are responsible for the organization. This is challenging, but it prepares you for the rest of your professional career.

CAPCA is a place to gain digital technology experience. Since the days of the CAPCA Forward Committee, the organization has recognized it needs an "app" to serve our Members. This was amplified during the pandemic as we had to organize a virtual Conference in less than six months! The dedication of the CAPCA Staff deserves all the credit for pulling that off. We realize that no one wants an all-virtual Conference again, but that one initiative greatly increased our digital capability. We have recently formed an ad hoc committee to guide our ongoing digital investments. If you want to learn what it takes to build software that our industry loves to use, join me in serving on the Technology Committee!

My intention in sharing what may be superficially described as bad experiences is that they were times of great personal growth for me. CAPCA is a place where it is safe to try out new ideas, debate with others, and make tough decisions outside of your place of work. You can take bigger risks, learn from your mistakes, and then you get to take that experience with you as you advance your career.

Where Else Will You Get Board Experience? – Do you hope to serve on a Board someday? Perhaps it's a small non-profit for which you're passionate about the cause. CAPCA is a relatively large and sophisticated non-profit. Your experience gained at CAPCA will greatly enhance your contribution to a smaller organization. Perhaps you want to serve on one of the commodity boards/commissions? CAPCA will train you as an advocate. We often partner with these boards in our advocacy efforts. Do you want to serve on a Corporate Board of Directors? This depends a lot of other qualifications, like executive experience, but serving on a well-funded non-profit board will help your resume and give you that hard-earned experience. CAPCA service is a great first-step in that direction. This is the perfect time of year to take the first step – so many chapters are holding their annual election of local Board Members and State Director. Contact your local Chapter President, introduce yourself if you don't already know them and ask the life changing question of how can I serve? It might not be State Director at first, but there is plenty of experience to be gained moving up the ranks from Chapter Board to State Board too!

Your Duty to Advocate – you know that we need many more of our Members to rise to the occasion and to advocate for balanced, science-based policy out of Sacramento. CAPCA will train you, inform you about your local policy-makers, guide you to where you can make a difference at home, and support your Chapter in making contributions. As a Board Member (who also happens to live in Sacramento), I have learned so much about how Sacramento works. On bad days, it's depressing. However, it is not hopeless. We aim to have more agriculture-friendly lawmakers by 2024. Our success in 2024 will depend on Members acting within their home districts. I can tell you that when Ruthann and I show up at the Capital, we are mostly placated by the lawmakers. However, when that same lawmaker has actual constituents (i.e. people who can vote for them) show up at their district office, it puts a lot more pressure on them to actually hear and respond to your viewpoint. I cannot understate the power you have as a constituent!

CAPCA is incorporating Advocacy training as a pre-conference event in Anaheim on Saturday, October 8 and Sunday October 9, 2022. If you are interested in the program opportunities or joining the training, contact Ruthann Anderson at ruthann@capca.com.

CAPCA is Fun – Becoming an active Member of your Chapter and at the Board level is a lot of work. It's work that provides you a lot of valuable experience and creates values for PCAs statewide. It's also fun. CAPCA is known for interactive events like Monday Night Football at Conference, and we strive to create that same culture in smaller settings too. In 2023 we plan on hosting Board meetings at alternating locations within California - Board Members and Chapter Presidents are invited to attend meetings. We often have great meals and find some sort of experience to help build relationships to keep PCAs connected around the career and organization that we are directing to enhance the license. ■




Advocacy Update

Louie A. Brown Jr, Kahn, Soares & Conway

Activity at the Department of Pesticide Regulation (DPR) has been intense since the start of the Newsom Administration. It started off with a bang when DPR issued its first ever cancellation of a product – Chlorpyrifos – and it hasn't slowed down since.

We spent most of last year engaged in a budget fight over the mil assessment. DPR and the Administration wanted to pursue an assessment increase but also a new formula for collecting the assessment based on warning terms placed on the label by US EPA. Industry ultimately prevailed by defeating the proposal, but the Legislature appropriated $10 million to study a new formula for the mil and provided DPR with an additional $45 million for 2 years to cover the costs of increased operational activities. Of course, this was in addition to the money appropriated for an electronic registration system which will ultimately be covered by increased registration fees.

There has been no slow down this year. It started with DPR identifying 4 county pilot programs to test a pesticide notification system. Then came the budget with multiple budget change proposals (BCPs) and trailer bill language (TBL) proposals. DPR is proposing changes in licensure renewal, moving from a 2-year cycle to 3 years. They are seeking to increase penalties for multi-jurisdictional violations and repeat offenders. And they are now seeking a rewrite of the certification and training regulations in an effort to comply with recent changes at US EPA.

In addition to the legislative activity focused on DPR, the Sustainable Pest Management Working Group (SPM) continues to meet and will soon have a list of proposed actions made public for the comment. The SPM is comprised of industry and environmental justice representatives, ag commissioners and academia with the goal to provide recommendations to the DPR on how to move towards a more sustainable pest management system, which remains undefined but we are told does not mean organic. From what we hear from those on the SPM, it most closely identifies with an aggressive form of IPM mixed with additional research and possibly prevention strategies for the introduction of new invasive species. In the very near future, recommendations from the SPM will be released for public review and comment.

While everything mentioned above has been taking place, CAPCA has also engaged in conversation with DPR and the Legislature to reinforce the role PCAs play in IPM practices. We are pursuing a minor, yet substantive change in the Food and Agriculture Code to add IPM to the list of continuing education topics for which DPR must approve. While courses in this education area are often approved, the statute is silent on it. Adding IPM to the list of subjects that shall be approved by DPR will make it clear to all IPM is one of the tools PCAs use when advising clients on pest management practices and will hopefully provide a clear role for PCAs in the implementation of the SPM recommendations.

We are entering a new age where DPR will be much more than registration of new products and licensure of application professionals. In the future, it will play a bigger role in transitioning agriculture to more "sustainable practices," community engagement and enforcement of violations. While this transition may be uncomfortable at times, one thing is for certain: the role of the PCA will be more important than ever. ■

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Ed Williams, Ventura County Agricultural Commissioner

By CAPCA Staff

Ventura County Agricultural Commissioner Ed Williams has had a career that has encompassed a diverse range of positions, including 30 years with the California Department of Food and Agriculture with responsibilities such as produce standardization, farmers' markets, organics, egg quality, pest exclusion, high risk issues, border stations, as well as acting as County/State Liaison for three Secretaries of Agriculture and Director of Measurement Standards, State Sealer. In addition to that experience, he has spent six years with Los Angeles Co. Agricultural Commissioner/ Weights & Measures and now four years as Ventura County Agricultural Commissioner (appointed as County Sealer of Weights & Measures in December 2021).

Ed's additional licenses/certificates include Executive Leadership certificates from UC Davis and University of Southern California-Sol Price. He graduated from CSU Stanislaus with a Bachelor's Degree in Biology/Botany.

Ed's years in the industry & background have been rounded out as approximately 45 years working in agriculture and agricultural regulation, starting in high school working in neighbors' orchards and on his brother's mobile haying operation in Northern California.

Describing his outlook as an Agricultural Commissioner for Ventura County, Ed explains "Our mission is to promote and protect agriculture, while ensuring the welfare of the public, the industry, and the environment through regulating pesticide use, plant quarantine, pest management, and business and consumer transactions. We conduct over thirty different programs in four divisions with a staff of 65 full-time and 10 intermittent employees." Ed believes in a progressive approach to regulation, starting with education first and then increasing to more restrictive or punitive measures only if necessary to gain compliance.

Ed reflects on the biggest highlight of his career as an ag commissioner: "Seeing staff I have worked with over the years become successful leaders in counties and state agencies throughout the State."

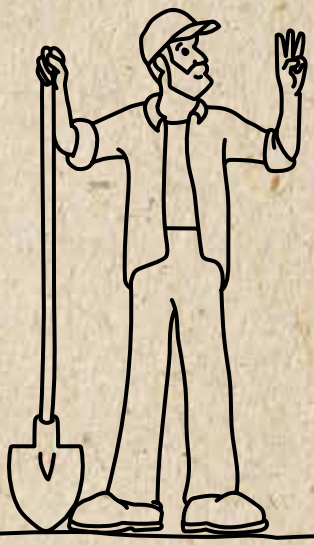
Ventura is one of the leading strawberry production counties in California averaging more than $612 million in value over the last five years. "Strawberries are susceptible to a wide range of pests from nematodes to fungal pathogens which are generally treated through tarped fumigations with Chloropicrin, Metam Sodium, Metam Potassium and/ or 1,3-D" Ed says. "We have a strong and very cooperative monitoring program for all fumigations which generally take place in late spring or summer months. We provide staff on weekends while fumigations are being completed, particularly near schools."

Ed further describes how their staff also has started collecting weekly air samples at the Rio Mesa High School site for DPR's Air Monitoring Program, to help monitor any volatile organic compounds that may be released from pesticide applications in the area.

Lemons have been Ventura County's second highest value crop for many years. "Ventura County is the number one producing county for lemons not only in California, but in the USA. Asian citrus psyllid (ACP) and citrus greening disease (HLB) are the biggest concerns for all citrus producers in California. ACP is established in Ventura County, but HLB has not been established here." Elaborating, he says: "It is critical to control ACP to keep the disease at bay. Ventura County has significant organic citrus production which requires the use of less-toxic materials, but sometimes requires additional applications to achieve adequate management. This has led to public concerns and complaints in some areas of the County about the number of applications being made. We have made a concerted effort to have staff onsite for many applications and to follow up on every complaint to ensure applications are made safely and legally."

Ventura County is also the leading production county in California and the USA for celery. In addition, the County produces a significant amount of cole crops, such as cabbage and brussels sprouts.

There have also been concerns about the increase and some signs of pesticide resistance in diamondback moth along the Central Coast production areas. In an effort to be proactive,



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Ed notes: "The Ventura County UC Cooperative Extension has been studying how best to address these concerns. Activities include monitoring adults near production fields in non-crop vegetation, research using entomopathogenic nematodes, field trials of various *Baccilus thuringiensis* products, spirotetramat and pyriproxyfen products, cabbage varietal tolerances, and best management practices."

When asked what he sees as the greatest concern for agriculture in Ventura County, Ed responds: "Agricultural production has been fairly stagnant over the past decade at least while input costs continue to skyrocket, particularly now with double-digit inflation in some areas.

"A great majority of Ventura County's water is locally sourced, with very little imported water from other areas, particularly for agriculture," says Ed. "The current drought situation is leaving many producers in doubt about which crop to plant, or whether they should plant. Reducing watering is causing stress to perennial crops, which is likely to impact production in the future. The extraordinary cost of housing has left farmers scrambling, trying to attract and provide for a limited labor force."

Of additional concern, Ed adds: "I also see the erosion of public trust and perceptions about the use of pesticides in agriculture as a big concern. Incomplete and inflammatory reporting does not reflect the comprehensive interagency measures in place in California to regulate the industry and to protect the public. They also fail to reflect the extraordinary 98%+ compliance rates with federal and state laws and regulations by agricultural operators based on over 32,000 inspections conducted by county inspectors statewide."

In discussing the partnership between DPR and County Agricultural Commissioners (CACs) in development phase and implementation of the statewide pesticide application notification system, along with the steps to incorporate critical input from community members, farmers and other stakeholders, Ed expressed confidence in their involvement. "Ventura is one of four counties working with DPR to assist in the development of the statewide notification system. The Ventura pilot project is focused on the Nyeland Acres Community which is near some of the most intensive agricultural production areas of Ventura County. We chose this area to provide a realistic snapshot

Advance Crop Yields and Plant Protection with an Integrated Crop Management (ICM) Program

An ICM program and crop production strategy integrates prevention and correction to reduce diseases, pests, and nutrient deficiencies, thus preventing crop loss and increase yields. This unique approach focuses on promoting soil and plant health as a means of improving a plant's immunity and defense systems while working in tandem with pest control products when needed. JH Biotech's ICM program utilizes products that defend against pests and diseases while encouraging soil bioactivity with beneficial microbes for continual defense and support.

Prioritizing soil and plant health for a better immune system

Providing plants with the right nutritional programs promotes healthier root systems, immunity, and defense systems. Products like **Biomin®** and **Phosgard®** allow plants to better absorb nutrients through both soil and foliar uptake, this solves deficiencies nearly immediately and more efficiently, providing plants a complex and strong immune system capable of standing up to crop diseases and invading pests. By improving soil fertility and biodiversity, many crops can benefit from the vast resources that come from vigorous root and immune systems.

Effectively control pests and diseases at early stages

Our ICM program aims to protect the natural environment while preserving water and revitalizing farmland for long-term, sustainable agriculture. A major factor to accomplishing this is to protect crops from diseases and pests. Using bio-pesticide products that are mindful to our environment such as **Fosphite®** and **Pest Out®** can disrupt pests and diseases effectively while free from harmful chemicals. Beneficial fungi, bacteria, and bio-stimulant such as **Fulzyme®**, **Promot®**, **Soluphos®**, and **Seamax®** work in ways that are disruptive to pests and diseases but also free up nutrients in existing farmland.

Benefits of ICM Programs

- Vigorous growth and better performance
- Uses microbial products increase soil biodiversity, fertility and properties
- Utilizing biostimulants and organic compounds to boost crop immunity
- Prevents and alleviates crop damages from abiotic and biotic stress
- Uses low toxic and bio-pesticides for pest management
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of how the notification system can work for the community. Those who sign up will receive either a text message or email letting them know an application of a California restricted material is scheduled to take place the following day. DPR is hosting a searchable website specific to Ventura County's pilot project (https://pilots.cdpr.ca.gov/ventura/) for anyone to find out what materials are to be applied and the area of the application to allow those who are concerned to avoid the area or to take measures they feel are necessary to protect themselves. Ventura County's pilot is unique among the others by developing provisions for Mixtec-speaking farmworkers and community members to sign up and to receive information about applications in their preferred language."

Over the years, the relationship with the industry, CAPCA and local PCAs in Ventura County has proven valuable to Ed: "Our department works closely and cooperatively with CAPCA and our local PCAs in assisting them to meet regulatory requirements for pesticide use. I spoke at our Ventura County CAPCA meeting on June 8th to share recent changes, how our cooperative efforts work to keep the public safe from misuse of pesticides, how PCAs and growers can avoid making mistakes in handling pesticides, and gave an overview of Ventura County's brand new Pesticide Notification Pilot Project. This project is one of four being conducted to help the California Department of Pesticide Regulation develop a statewide notification system. In March, we conducted a unique Spray Safe event at the Ventura County Fairgrounds, using a drive-in theater format due to COVID concerns. We spent months developing a valuable agenda specific to Ventura County's needs. More than 400 people attended the event."

Maintaining and strengthening communication and collaboration in the County with all stakeholders is of upmost importance to Ed and his team. Their goals include keeping the lines of communication open and encouraging those in the industry to share their concerns with their office. "We can't address shortfalls or omissions unless we are aware of them. It is critical we hear about evolving issues before they become a problem."

"It is critical that the industry keeps sharing all of the things they do for the good of the public; food doesn't just magically appear in the grocery store. There are very limited areas of our world where we can grow certain types of crops, and California is critical in providing many of those agricultural products. It is critical for growers, CAPCA and PCAs to keep up with and to maintain a spotless record and reputation when it comes to compliance with the laws and regulations. If the industry is aware of anyone taking short cuts, they need to challenge them to do better for the sake of the public and the industry."

When asked what he finds most challenging on a daily basis, Ed responds: "Maintaining balance and making sure all of our programs are being carried out well." The relevant programs or issues he would highlight for CAPCA members include encouraging CAPCA members to keep up their BeeCheck Notification work and to provide input on the various pesticide notification pilot projects.

Ed says that one of the most frequently asked questions he hears from growers, applicators and PCAs is: *"What new regulations or permit conditions are coming that I need to be aware of?"* Ed replies: "Due to Statutes changed prior to 2021, we can expect to see changes in regulations regarding Neonicotinoid Mitigation (3 CCR sections 6990-6990.16; Statutes Being Implemented: FAC sections 11456, 12838, 12976), the Medical Supervision Program (3 CCR section 6728; Statute Being Implemented: FAC section 12981), Pesticide Decontamination Sites (3 CCR sections 6720, 6732, 6734, 6738.4, 6771, 6793; Statutes Being Implemented: FAC sections 11456, 12981), and 1,3-Dichloropropene Mitigation (3 CCR sections 6448, 6448.1, 6559, 6624, 6626; Statute Being Implemented: FAC section 11456)." Ed encourages all PCAs to reach out to their Agricultural Commissioner's office and to stay as informed on regulatory developments as possible. ■

Ventura County Pesticide Notification Pilot Project
https://pilots.cdpr.ca.gov/ventura/

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2022 Renewal Information for DPR A-L License and Certificate Holders

Dates for Renewal

DPR encourages submitting completed renewal applications to DPR by October 1, 2022 to best ensure you receive your new license/certificate before the New Year.

Processing time is 60 days for applications with payments processed by November 1. Applications received after November 1 may experience a longer processing time and you may not receive your license/certificate by January 1. You cannot legally work without a valid license/certificate.

Note that submitting your renewal before October will ensure you have your license/certificate by early December and allow you to renew with the County by the New Year.

Address Changes

Always notify DPR in writing immediately of any address or name changes. When emailing DPR it is best to include your full name (First MI Last) or business name as well as your DPR License or Certificate Number.

Mailing of Renewal Packets

DPR is mailing renewal packets in August to provide sufficient time for license and certificate holders to submit their applications by October 1. Renewal applications must be postmarked on or before December 31, or a late fee applies.

If you did not receive your renewal application or misplaced it, download a renewal packet from DPR's website.

Qualified Person for Business

Business applications are held until the Qualified Person's license or certificate has processed. It is best to submit the Business and Qualified Person's individual application by October to allow time to register with the County before the New Year.

Individual License and Certificate Renewal

The following forms will be included in the renewal packet:

- Renewal Application DPR-PML-141
- License/Certificate Renewal Information
- CE Records Renewal Summary DPR-PML-123
- Visa/MasterCard Transaction DPR-105

Renewal applications need to be signed and must include the required CE records summary and correct fee.

Check Your Renewal Status on DPR's Valid License Web Page:

Continuing Education

You must retain copies of your CE records for three years. DPR may request copies of your CE records to audit at any time. DPR does not track CE hours for individuals.

Submit the CE Records Renewal Summary, DPR-PML-123 or a summary record of CE attendance from a third-party professional association.

Your CE records must include:

- License/Certificate Holder's Name
- License/Certificate Number and Type
- Course Location
- Course Title
- Course Date
- DPR Course I.D. Number
- Course hours attended for each CE category
- Name of instructor or sponsoring organization
- Your Signature

General Information about CE Courses

DPR-approved CE hours must be obtained during the valid period of the license or certificate. The valid period is listed on the license or certificate (from the 'date of issue' until the 'valid through' date). No grace period is given to obtain CE hours. No CE hours can be carried over to the next renewal period.

If renewing multiple licenses or certificates, you only need sufficient CE hours to meet the license/certificate with the most CE hours required.

Questions about your CE hours?

For questions about your CE hours, you must contact the course sponsor or your professional association. See DPR's website for current or previous years' courses and sponsors' contact info.

DPR Electronic Mailing List

Sign up for important information and updates from DPR about Licensing and CE.

Early Renewal REMINDER

The Department of Pesticide Regulation (DPR) will mail out renewal packets in August to license and certificate holders with surnames or business names starting with the letters A-L.

AVOID PROCESSING DELAYS

Submitting earlier allows DPR staff additional time to deal with issues or problems that could delay processing your license.

SUBMIT BY OCTOBER

Please mail your application before November so that your license or certificate can be issued before it expires. Submit before October, and be renewed by early December to register with the County before the New Year.

RENEW QP EARLY

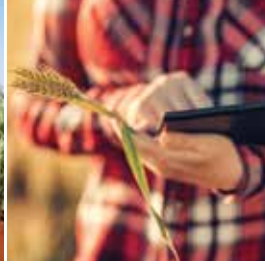
For pest control businesses, the qualified person must be renewed before the business license can be processed. Submit renewals at the same time **before** November.

California Environmental Protection Agency
dpr Department of Pesticide Regulation

If you do not receive your application in the mail, scan the QR to visit our web site and download a copy.

If you need to contact Licensing at LicenseMail@cdpr.ca.gov, don't forget to include your full name (First MI. Last) and license number(s) so staff can assist you faster.



CAPCA Member Benefits Are Worth Having

Crystelle Turlo, Chief Operations Director

CAPCA has been providing membership benefits to licensed Pest Control Advisers for over 45 years. As a professional trade association, it is essential that our membership finds real value in the benefits that we provide. As the association has evolved, we have worked hard to support our members and continue to create a quality list of benefits to enjoy.

Having access to quality and affordable continuing education is important for our members and this alone is a great reason to keep your membership current. For over two years, CAPCA has worked hard to increase online CE offerings. In 2020, we rolled out online continuing education as fast as we could so that our members were still able to receive the hours needed to renew their licenses. In fact, we provided over 12 hours of CE outside of the continuing education we offered during the online Conference that year. As we developed our online platform, we provided many free hours to our members, and we continue to do so in 2022. Members can purchase online CE easily from the CAPCA website and can see available free CE offerings on their CAPCA dashboard.

CAPCA is committed to our member's professional development and provides quality and useful resources. All our members enjoy a free subscription to the Adviser – CAPCA's magazine that is published bi-monthly and is full of important industry-focused content. Additionally, members have access to a free digital subscription to the Agri-Pulse newsletter that is sent weekly on Wednesdays. Finally, to ensure our members are aware of the laws that affect their industry, we have provided and continue to provide valuable advocacy training online and at in-person events. We also have many opportunities for members to get involved in advocacy and share their story.

Remember, CAPCA is not just a state association. Members are encouraged to join at least one of the 16 CAPCA chapters and are asked to get involved at the local level. Active Chapters offer members additional continuing education in-person, and some host fundraising events with many opportunities to network and volunteer. Being part of your Chapter can lead to more professional growth development, mentorship and even job opportunities.

If you need more information on how to get involved in your Chapter or would like to know how to utilize some of the benefits listed, please reach out to the State office for assistance. We will be happy help. ■

https://capca.com/membership/

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2022 CAPCA CONFERENCE

October 9-11, 2022 | Disneyland Resort | Anaheim, CA

48 Annual CAPCA Conference & Agri-Expo

REGISTRATION IS NOW OPEN!

Conference Schedule:

SUNDAY, OCTOBER 9, 2022 - 3.5 DPR Hours

Nitrogen Management Session

Crop Round Table Meeting: Wine and Table Grapes

Exhibitor Presentations

MONDAY, OCTOBER 10, 2022 - 7.0 DPR Hours

General Session

Exhibitor Presentations

TUESDAY, OCTOBER 11, 2022 - 3.5 DPR Hours

General Session

Exhibitor Presentations

CE Hours and Program Information:
Anaheim Continuing Education Program
October 9-11, 2022 | Disneyland Resort, Anaheim CA
https://capca.com/conference/conferenceprogram/

DPR Hours Total 14.0 (1.5 Laws & 12.5 Other)
Please note: No Label update session will be held in Anaheim

Registration Pricing:

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Early Member	**$475**
Member	**$515**
Early Non-Member	**$555**
Non-Member	**$595**

Professional Attendee Registration $495

Companion Registration* $395

*Companion Registration available August 31st-October 3rd, 2022
Early Registration discount $40 (available until August 30th)

CAPCA Member discount $80

Pre-Recorded Label Update Program (4.0 DPR Hours Laws)
Label Update sessions are included with Early Registration purchase of Member or Non-Member registration through August 30, 2022. This program will be available to Early Registered Members and Non-Members starting in September and accessible through December 31st, 2022.

Label Update Only will be available online for purchase starting in October 2022.

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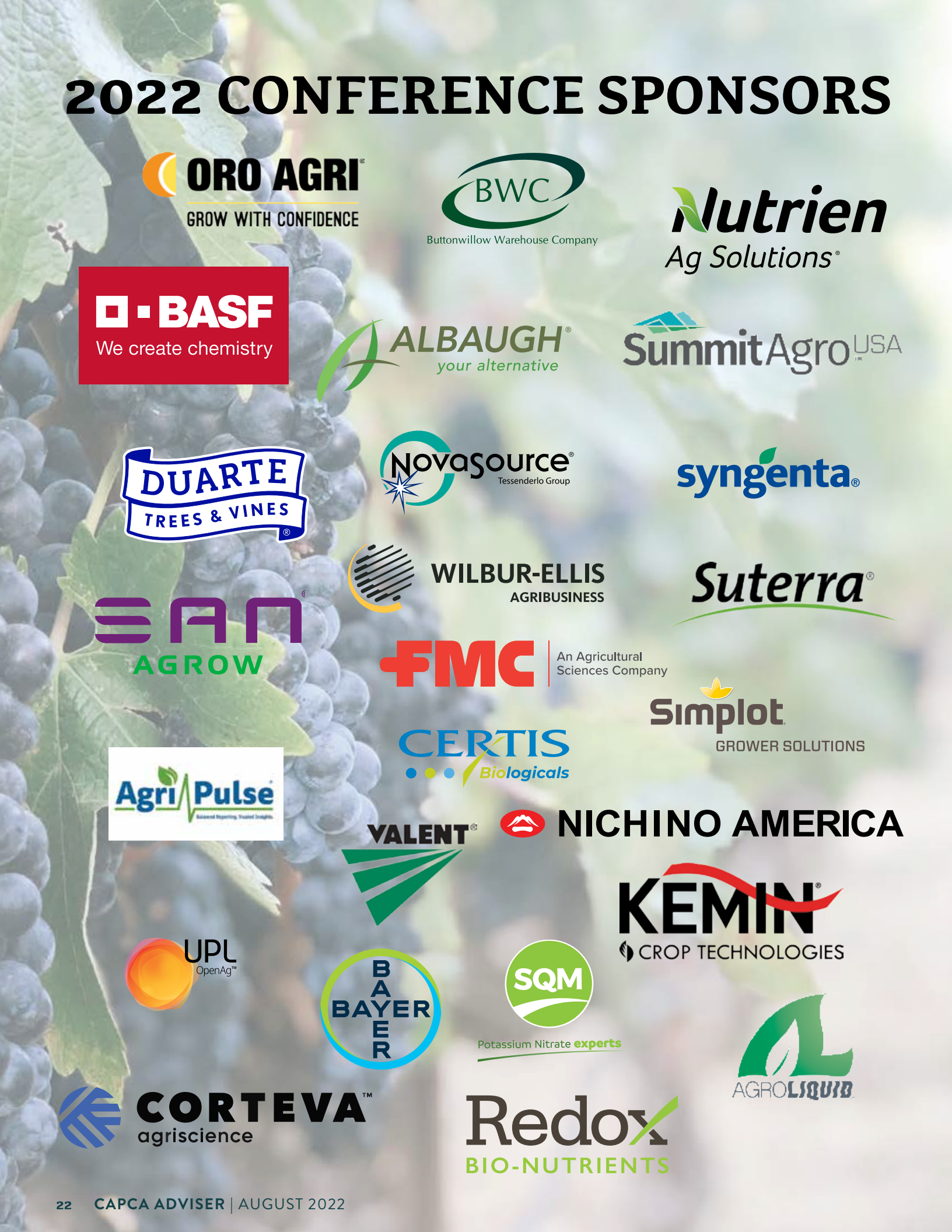

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Subscribe at:

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California Department of Pesticide Regulation

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48 Annual CAPCA Conference & Agri-Expo

RUBEN ARROYO
Riverside County Ag Commissioner
CACASA Update

Dr. FRANK BYRNE
University of Califrnia, Riverside
Neonicotinoid alternatives for Asian Citrus Psyllid Management in California

CHRIS CHEN
University of California Cooperative Extension
Wine and Table Grape Round Table
Abiotic Stress in Vines

Dr. OLEG DAUGOVISH
University of California Cooperative Extension, Ventura
Soil - Borne Peste Management

Dr. BEN FABER
University of California Agriculture & Natural Resources
Avocado Herbicide Alternatives to Glyphosate

JIM HARTMAN
Los Angeles Deputy County Ag Commissioner
Managing Burrowing Rodents

VICTORIA HORNBAKER
Citrus Pest and Disease Prevention Division
Asian Citrus Psyllid and Huanlongbing Treatment and Quarantines

Dr. IGOR LACAN
University of California Cooperative Extension
Diagnosis and Management of Phytophthora Diseases in the Ornamental Landscape - Sudden Oak Death and Others

Dr. CHRIS MCDONALD
Natural Resource Advisor, Southern California
Using Organic Herbicides on Roadsides and ROW: Evaluating Costs and Effectiveness

KYLE MCABEE
McAbee Ag Consulting, Inc.
Wine and Table Grape Round Table

CAPCA CONFERENCE 2022

Continuing Education Program Speakers

FEATURED KEYNOTE SPEAKER:

ANTHONY LAFAUCE
The Clyde Group
Taking Pride in Protecting California: Why Don't We Get Credit for What We Do?

DR. KARLA MEDINA
Marron Bio Innovations
Nematicide Landscape 2022 and beyond: Implications for current and upcoming products

DR. SCOTT STEINMAUS
California Polytechnic University
Wine and Table Grape Round Table

DR. IVAN MILOSAVLJEVIC
University of California, Riverside

Maximizing IPM of Argentine Ant and Spa Sucking Pests (with Biodegradable Hydrogels, InfraRed Sensors, and Cover Crops)

DR. EMILY SYMMES
Suterra & UCCE

Wine and Table Grape Round Table &
Lessons Learned After 50+ Years of Mating Disruption: A Deep Dive into MD Science and Systems

DR. MELISSA O'NEAL
Marrone Bio Innovations
The Future of Biologicals and How Biologicals Improve Your IPM Program

NANCY VOORHEES
Clarke Mosquito Control Products
Trends in Mosquito Control in California Mosquito and Vector Control Districts

JOHN RONCORONI
University of California Cooperative Extension
Best Management Practices for Weed Control in Vineyards

DR. DREW ZWART
Bartlett Tree Research Laboratories
Disease and Insect Management in Trees and Shrubs

JEFF RASMUSSEN
Delmart Farms
Wine and Table Grape Round Table

48 Annual CAPCA Conference & Agri-Expo

Nitrogen Management & Irrigation Update

CAPCA Annual Conference Breakout Session

CCA CE Program Pending
Date: October 9, 2022
Time: 9:00 a.m. to 11:50 a.m.

Program included in registration
No DPR credit available with Nitrogen Management & Irrigation Update

48 Annual CAPCA Conference & Agri-Expo

CAPCA would like to acknowledge the contribution and support of CDFA FREP in the development of this year's Nitrogen Management & Irrigation Update program.

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- **Damien Jelen**, Water Management Service Advisor, Jain Irrigation Inc., Dos Palos, California

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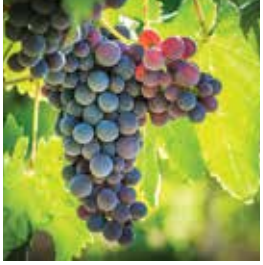


A ban on neonics in backyards stirs fears over citrus greening

Brad Hooker, Agri-Pulse

A bill proposing to ban nearly all nonagricultural uses of the neonicotinoid class of pesticides has been advancing through the California Legislature, despite strong opposition from agricultural groups. Debates over the bill have raised fundamental questions over the role of the Legislature in overriding regulatory agencies and how much risk is acceptable when applying pesticides.

The bill aims to protect bees and other pollinators by specifically targeting uses for lawns, gardens and golf courses. The Natural Resources Defense Council (NRDC) is co-sponsoring the measure alongside two other environmental groups.

"These uses also present exposure risks for people, because they are used on lawns and other areas where pets and children play," argues NRDC attorney Lucas Rhoads, in a statement on the bill. "Nonagricultural uses of neonics are the least justifiable out there."

Farm groups have lined up against the measure, arguing it undermines the regulatory process and would enable invasive pests to proliferate.

During a recent committee hearing on Assembly Bill 2146, Chris Reardon, vice president of Pest Control Operators of California, took the unusual position of defending the Department of Pesticide Regulation as "the definitive pesticide use enforcement department in the country."

Louie Brown, a lobbyist for Kahn, Soares & Conway representing several farm groups, said DPR toxicologists are "great at what they do" and that DPR found the risk to pollinators for nonagricultural uses too low to pursue a reevaluation of urban uses.

"If you, the Legislature, disagrees with that," said Brown, "rather than taking the chemistry and taking the science into your own hands, let's direct them to go back and do what they're paid to do."

Brown commended Assemblymember Rebecca Bauer-Kahan of Orinda for working with DPR on her measure but pointed out that CDFA is the agency that handles invasive pests. The citrus industry, he explained, has spent millions of dollars to educate landowners about treating backyard citrus trees to prevent the spread of Asian citrus psyllid, the host insect for the bacteria that leads to citrus greening.

Bauer-Kahan responded that while DPR is reevaluating agricultural uses, "they haven't even started discussing" residential uses. Her proposed ban would take effect at the start of 2024 and would prohibit the sale, possession and use of neonics throughout California. It mirrors a ban adopted in New Jersey and follows the lead of the European Union in banning all use of neonics.

Brown argued the terminology borrowed from the New Jersey legislation is not applicable to California law, since it would charge DPR with making an emergency declaration regarding pests and the department does not monitor pests. He proposed a more surgical approach that would instead update the product label for turf and ornamental applications.

Bauer-Kahan has been attempting to set stricter limits on pesticide use for several years. The Bay Area Democrat introduced a measure last year that would have banned neonic-treated seeds, but pulled it ahead of a hearing. In 2020 the Bay Area lawmaker proposed higher fines for spray drift incidents, but that bill also did not progress.

AB 2146 has already passed several committees and the Assembly along party lines and is awaiting a critical vote in the Senate Appropriations Committee. While analysts estimate the measure would cost the state little to implement, it could result in significant revenue loss for DPR through a reduction in mill assessment, registration and renewal fees—further exacerbating a longtime structural imbalance in the department's budget.

CDFA could face increased costs for treating a rise in pest infestations following the ban. A recent infestation of glassy-winged sharpshooter in Solano County, for example, has cost CDFA more than half a million dollars annually to treat.

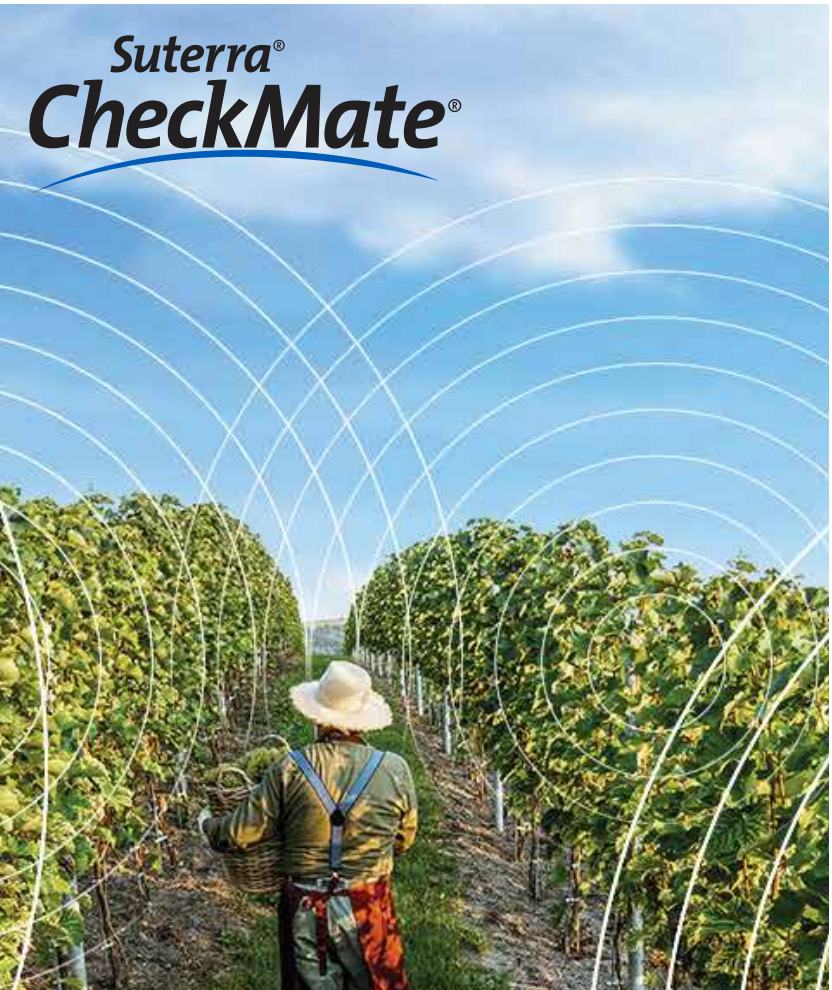
Bauer-Kahan, however, argued that the loss of pollinators threatens more than $15 billion in agricultural production in California and is already limiting yields and driving up food prices. Proponents blamed the leaching of neonics into urban water sources for the decline of bee populations, putting one out of every four bee species at risk of extinction, with California hosting more than 1,600 bee species. They also raised fears of neonics threatening the health of children as a neurotoxin.

But neonics are the most widely used insecticide in the world for their effectiveness in protecting people from other diseases, according to Christopher Finarelli, a government relations director for the Household and Consumer Products Association. Cockroaches, for example, can trigger asthma in children, while ticks and fleas can carry a variety of diseases.

Responding to Finarelli, Bauer-Kahan said her bill offers an exemption for internal uses of neonics as well as for controlling invasive pests in backyards. While DPR is proposing a complex mitigation process for neonics in the agricultural setting, she reasoned that an outright ban would be easier for general consumers to understand than changing the label. To Brown's concerns over DPR monitoring pests, she said the bill would require CDFA to be in close consultation with DPR on such issues.

Republican Senator Brian Dahle, who runs a seed and trucking business in Lassen County and often describes himself as the only lawmaker with an applicator permit, countered that the issue in not a regulatory challenge but a need to better educate homeowners on how to safely apply pesticides.

"We can run laws and make it a misdemeanor and all these things, but we really need to educate people at the end of the day," said Dahle. ■



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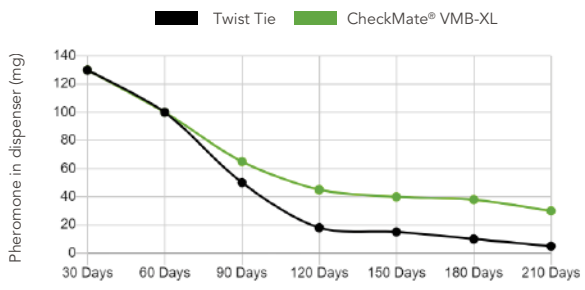

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12:00 p.m. - 4:30 p.m.
Registration coming in August 2022

STUDENTS:

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Companion Pass for Conference Program (including Student Networking Event) $395

COMPANY RECRUITER REGISTRATION:

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Managing grapevine powdery mildew with biopesticides and other natural products: some considerations and perspectives

Wayne F. Wilcox, Professor Emeritus, Cornell University (Geneva, NY)

Interest in limiting synthetic fungicide use continues to increase for well-known reasons, including an emphasis on the concept of sustainability and the need to minimize pressure on developing resistance to modern synthetics. However, for alternatives to synthetic fungicides to be economically sustainable and truly provide resistance management, they must control disease. This article summarizes some basics regarding biological and natural fungicides and discusses some strategies for utilizing them to control grapevine powdery mildew, a disease particularly susceptible to such products.

Powdery Mildew Biology Affecting Control

Most fungal pathogens cause disease when germinated spores penetrate their host plants and colonize susceptible tissues from *within*. In contrast, germlings of powdery mildew spores penetrate only the top epidermal cell to form a specialized feeding structure and subsequent fungal growth is entirely on the *surface* of infected tissues. This makes it susceptible to topical applications of some materials (e.g., various salts, oils, peroxides) that have far less effect on most other diseases, whose causal fungi are embedded within. To what extent this might also apply to some antifungal compounds from various microbial biopesticides is unclear, although it seems likely.

Biopesticide Nomenclature

The EPA has two defined categories of products they recognize as biopesticides that are relevant to control of most plant diseases:

i. **Biochemical pesticides** are naturally occurring substances that control pests by "non-toxic" mechanisms. Ingredients registered for use on grapes include chemicals produced by microorganisms (e.g., Polyoxin D); inorganic salts (e.g., potassium bicarbonate, potassium dihydrogen phosphate = monopotassium phosphate); dihydrogen dioxide (hydrogen peroxide); and various plant extracts including oils (Neem, Tea tree, thyme, etc.), polypeptides (e.g., BLAD), and other unspecified components (e.g., from *Reynoutria sachalinensis*). Two naturally occurring substances used in many organic production systems, sulfur and copper, are not considered biopesticides under this system. Similarly, whereas many oils extracted from living plants are considered biopesticides, mineral oils from refined petroleum are not, although some are approved for use in organic production systems.

ii. **Microbial pesticides** consist of a microorganism (usually a bacterium or fungus for plant disease control products) as the active ingredient. Several of the more prominent of these used on grapes are species of the soilborne bacterium *Bacillus* (*B. amyloliquifaciens, B. mycoides, B. pumilis, B. subtilis*). Other active microbials available on grapes include species in the bacterial genus *Psuedomonas* and the fungal genera *Trichoderma* and *Aureobasidium* (Botrytis control). If using a fungal active ingredient, its tolerance of other fungicides potentially used in the program must be considered.

Mode of Action

The mode of action of some biopesticides is well studied whereas that of many others is not or claims made for them are based upon unavailable proprietary data. A few biochemical biopesticides interfere with fungal metabolism (e.g., Polyoxin D inhibits the synthesis of fungal cell wall chitin), although the "nontoxic" requirement for this designation often precludes physiological mechanisms. Thus, many biochemical biopesticides—e.g., the salts, oils, and peroxides—rely on physical disruption of the fungal pathogens. In a series of tests examining monopotassium phosphate (MKP = potassium dihydrogen phosphate), my lab found that spraying before inoculation with powdery mildew spores provided no control, whereas spraying 1 to 3 days after inoculation provided excellent control and spraying 7 to 10 days after provided moderate control. Other published photos show collapsed mildew colonies after treatment with potassium bicarbonate. Conclusion: protective spray residues don't inhibit spore germination and ensuing infection but sprays applied to nascent or very young colonies cause fatal osmotic shock. In field trials, we found that frequency of application was far more important than the rate or specific salt applied, suggesting that a general threshold of molarity and early treatment of developing colonies are of paramount importance.

Peroxides and oils also work primarily against developing colonies and can provide significant eradication of well-developed infections to the extent that thorough spray coverage is provided. Additionally, lab studies have shown that at least one popular petroleum oil product provides several days of residual protective activity after application.

Sulfur basics, briefly: (i) in addition to excellent protective

activity sulfur provides excellent control when applied 5-7 days after an infection event, but only fair control when applied to older existing colonies; (ii) persistence (good for control, bad for harvest residues) is a function of both application rate and particle size (micronized formulations, wettable powders, and dusts having progressively larger particles and less persistence); and (iii) the detrimental effects of harvest residues on wine making are far more important for red wines than for most whites, since sulfur particles settle out during must clarification of the latter.

Microbial biopesticides act via several different mechanisms, depending on the microbe involved. For example, *Aureobasidium pululans* (Botrytis control) appears to function primarily by competing with the pathogen at potential infection sites on the plant. This suggests that such products must be applied before any given infection event occurs. Similarly, *Bacillus mycoides* appears to function by inducing plant defense chemicals, so should be most effective when applied before an infection event, allowing time for sufficient induction of these chemicals before they are needed. In contrast, *Bacillus amyloliquifaciens, B. subtilis, B. pumilus,* and *Pseudomonas chlororaphis* appear to function via their production of antifungal compounds, which potentially interfere with spore germination (protective activity) and/or fungal growth on treated surfaces (post-infection activity against powdery mildew).

Biofungicide Use Principles

Most biofungicide producers acknowledge that the best synthetics are more powerful. This doesn't mean that biofungicides can't provide commercial levels of control but does mean that they must be used more thoughtfully than the "big guns," which are more forgiving of holes in the management program or extreme disease pressure. Bottom line: biofungicides are most effective when used within a complete disease management program, which includes appropriate cultural control practices, good spray timing, and good application technique. They will also perform best when inoculum pressure is low to modest (e.g., to maintain a relatively clean vineyard) but should not be relied upon to "put out a fire" if an epidemic gets started.

The effect of disease pressure on biopesticide performance was illustrated in trials we ran examining full season applications of only *Bacillus amyloliquifaciens* and a second program alternating Polyoxin D and an oil. In an extremely high-pressure block of Chardonnay, the unsprayed clusters were destroyed and neither program did well. Yet in a nearby block of a less susceptible cultivar with lower inoculum pressure, "only" 40% of the unsprayed cluster surfaces became diseased and these two programs reduced mildew severity by 92 and 97%, respectively.

Biofungicdes In Commercial Mildew Management

Although some producers may opt to use biofungicides exclusively, they are likely to be most effective within programs that include other effective products, including sulfur and conventional synthetics. There is no single best way to do this, but a couple of considerations:

- Grape berries are highly susceptible to powdery mildew for the first 2 to 3 weeks after flowers start to open but lose

Photo: Certis Biologicals/O'Neil Arnold

Table 1. Control of powdery mildew on Chardonnay grapevines with biopesticide programs in 3 years of Cornell University trials in Geneva, NY

				Powdery Mildew, % Control**		
Year	**Trt. #**	**Active Ingredient**	**Timing***	**Leaf Severity**	**Cluster Incidence**	**Cluster Severity**
I	**1.**	Untreated	---	*(89)*	*(100)*	*(100)*
	2.	Fluopyram+ tebu.	1 – 7	99	88	99
	3.	Sulfur (micronized)	1 – 7	93	35	84
	4.	*Bacillus mycoides*	1 – 7	86	66	93
	5.	*Bacillus mycoides*	1, 3, 5, 7			
		Metrafenone	2			
		Fluopyram+ tebcon.	4			
		Sulfur (micronized)	6	97	93	99
	6.	nothing	1, 3, 5, 7			
		Metrafenone	2			
		Fluopyram+ tebu.	4			
		Sulfur (micronized)	6	60	55	93
II	**1.**	Untreated	---	*(87)*	*(100)*	*(96)*
	2.	*Bacillus mycoides*	1 – 7	88	34	79
	3.	Difenoconazole	1			
		Metrafenone	2			
		Fluopyram+ tebu.	3			
		Flutianil	4			
		Bacillus mycoides	5, 6, 7	100	98	99
	4.	Difenoconazole	1			
		Metrafenone	2			
		Fluopyram+ tebu.	3			
		Flutianil	4			
		Sulfur	5, 6, 7	99	88	99
III	**1.**	Untreated	---	*(55)*	*(95)*	*(60)*
	2.	Metrafenone	1, 3, 5, 7			
		Flutianil	2, 4, 6	100	90	99
	3.	*Bacillus mycoides*	1, 3, 5, 7			
		Flutianil	2, 4, 6	99	80	97
	4.	*Bacillus mycoides*	1, 3, 5			
		Reynoutria extract	2, 4, 6			
		BLAD polypeptide	7	100	88	99

*Spray programs were initiated approximately 2 wk prebloom (Timing #1) and continued at 2-wk intervals, with a total of 7 applications. Spray timings #2 and #3 covered berries during their peak period of susceptibility.

**Data are presented as % disease reduction relative to the untreated check vines. Actual disease incidences on clusters (% with any disease) and severities on clusters and leaves (% area diseased) of unsprayed vines are provided parenthetically in italics, to indicate levels of disease pressure in each trial.

susceptibility rapidly after that (although cluster stems retain some susceptibility beyond then). Therefore, bloom/early postbloom is when you'll get greatest value with limited applications of top synthetic fungicides. If the flowering period in a vineyard continues across several weeks, think of the critical period for berry infection as lasting from the start of flowering until 2-3 weeks after it ends.

- Many grape buyers have preharvest limits on sulfur use as berries mature into the summer. This is an ideal window for biofungicide use, when cluster stems and new leaves are the organs in greatest need of mildew protection.

- Biofungicides may also have a fit in the early, prebloom season when inoculum pressure is usually low.

Table 1 presents the results of 3 years of trials in a Chardonnay vineyard in Geneva, NY, in which my group (and Dr. Katie Gold, Year III) examined various programs utilizing a product containing *Bacillus mycoides*. In Year 1, the biopesticide provided credible control when used alone all season (Trt #4), but somewhat less than a top synthetic standard (#2) and comparable to micronized sulfur (#3).

However, when alternated with three standard products (#5), control was excellent and comparable to the synthetic standard used all season. Comparing Treatments #5 and #6 shows the contribution of the biopesticide in this program.

A treatment (#3) in Year II was designed to test the concept of using strong synthetics until fruit lose susceptibility, then finishing the season with a biofungicide to maintain control on leaves and cluster stems. This provided virtually complete control even in a high-pressure situation, at least equivalent to the comparable program finishing with sulfur (#4). However, the seasonlong program of biofungicide alone (#2) allowed unacceptable levels of disease.

In Year III, a season with less disease pressure than the other two (compare untreated vines), most programs utilizing synthetics and/or biofungicides provided good to excellent control as shown in the examples provided.

Biofungicides can have a place in many mildew management programs, provided that they are competitively priced and used judiciously. Published trial results provide a useful source of reference, but there is no substitute for experience under real-world commercial conditions. ■

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To Chip or Not to Chip – That is the Question

by Almond Board of California

At the end of an orchard's productive life, almond growers must decide what to do with their old trees: either replant immediately or wait a year. Removing old orchards and preparing to plant new trees is an intense job with important decisions required at every turn, including whether to fumigate, what varieties and rootstocks to plant, what irrigation system to install and what practices will be the best to enrich soil health and ensure long-term orchard productivity. For some growers, immediately replanting may not be the best option – taking a year off to reestablish the next orchard may be a better decision.

The process of grinding whole trees into chips, spreading the chips evenly on the soil surface, then incorporating them into the soil before replanting, called Whole Orchard Recycling (WOR), has been widely adopted by California almond growers.

Whole Orchard Recycling is an innovative and sustainable practice that contributes to the success of the subsequent orchard by not only putting everything grown in the previous orchard to optimal use (achieving zero waste) but also providing value back to the grower by delivering nutrients, improving soil quality and ultimately, potentially, increasing yields.

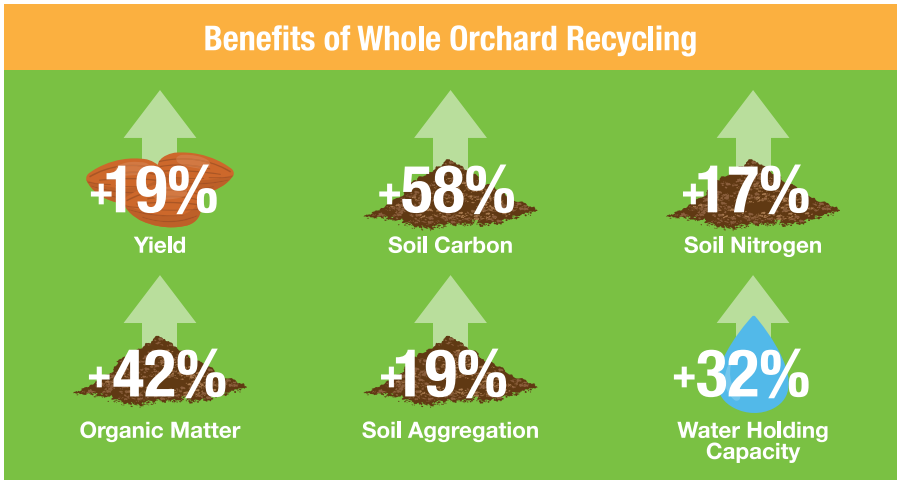
While Whole Orchard Recycling is an added cost to growers, there are several opportunities for growers to receive financial assistance:

- San Joaquin Valley Air Pollution Control District - Ag Burning Alternatives: Up to $600 per acre of trees chipped and incorporated into the soil. An extra $100 per acre incentive for operations with less than 100 acres.

- USDA Natural Resources Conservation Service – EQIP Program: Provides financial & technical assistance to agricultural producers who chip and incorporate trees when growers remove an orchard, apply compost.

- California Department of Food and Agriculture – Healthy Soils Program: Provides financial incentives to California growers and ranchers to implement conservation management practices that sequester carbon, reduce atmospheric greenhouse gases and improve soil health. Over a dozen WOR projects funded in 2020.

Visit Almonds.com/Grants for an overview of available incentive funds to assist growers in implementing Whole Orchard Recycling. ■



Considering Chipping?

Invest in Your Future Today!

Whole Orchard Recycling not only puts everything grown in the previous orchard to optimal use, but also provides value back to the grower in the following ways:

- **Provides nutrients**
- **Improves soil quality**
- **Increases yields**

Scan the QR Code for Whole Orchard Recycling tools, video resources, and incentive funding opportunities.

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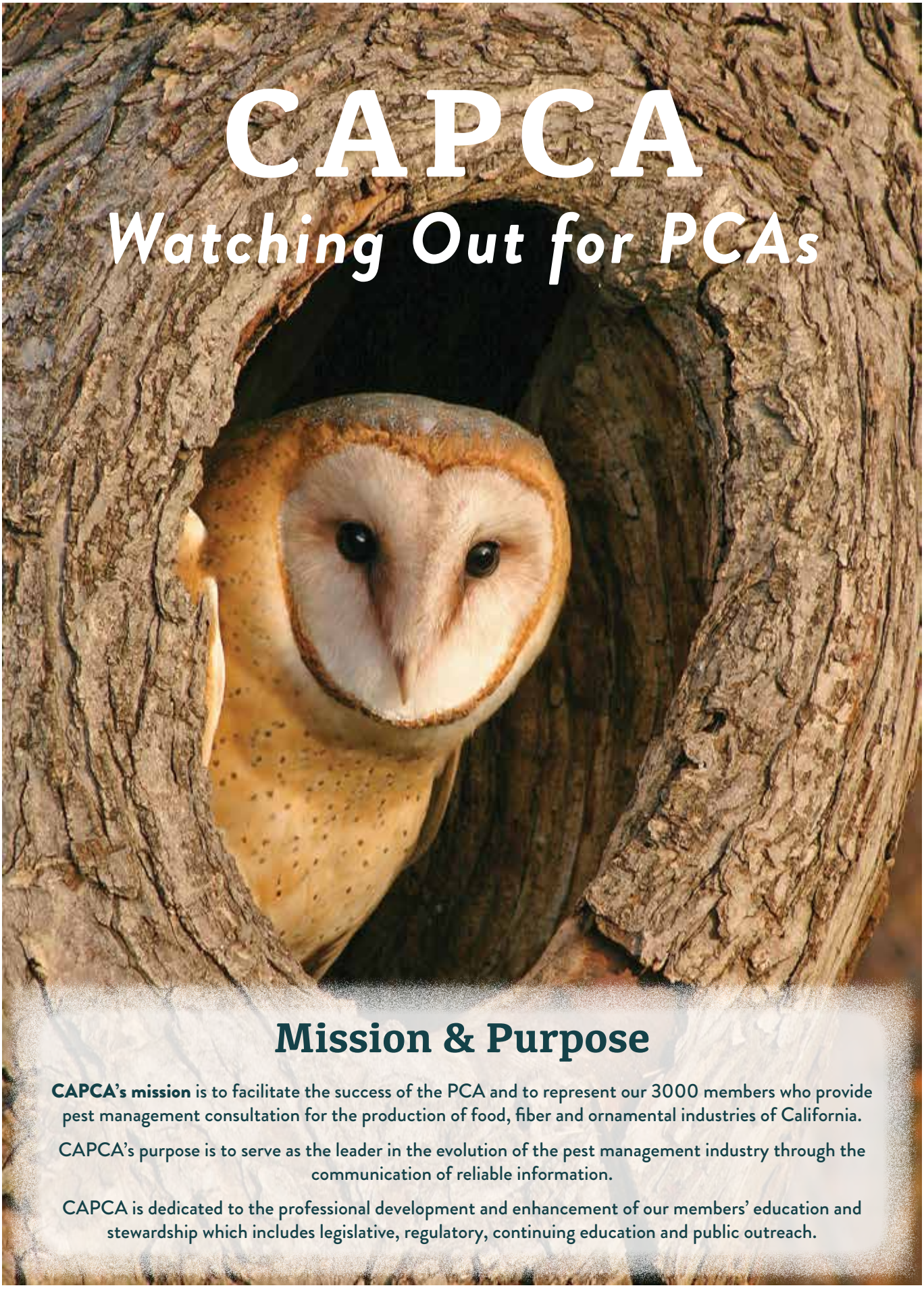

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CAPCA's purpose is to serve as the leader in the evolution of the pest management industry through the communication of reliable information.

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BOOST FLOWER BUD DIFFERENTIATION AND BLOOM HEALTH WITH POSTHARVEST FOLIAR NUTRITION

The crop is finally off, and you're ready to take a break. Not so fast though — next year's flower buds continue to differentiate over the fall and winter until they bloom in the spring. Additionally, those flowers at bloom time rely on stored carbohydrates for energy, most of which is created after the crop is removed. Before taking that well-earned break, set your trees and vines up for success next year with a science-driven postharvest foliar fertilizer application from Agro-K.

"Certainly, after the harvest while the foliage is still on, the plants are active and need nutrition to restore energy reserves depleted while developing this year's crop," says Sean Jacobs, Technical Sales Representative at Agro-K. "But, even during dormancy, many plant processes are still active, especially in the roots and developing buds. Postharvest foliar nutrition can help make sure plants are operating at ideal efficiency photosynthetically, so they can create carbohydrate reserves. It also makes sure you're getting nutrients into the plant that can be reallocated to buds, so they have the nutrients they need to continue to develop and differentiate."

The Critical Window for Next-Season Nutrition

Jacobs says many perennial crops continue bud differentiation during dormancy while others are fully differentiated at leaf fall. Either way, nutrients need to be in the buds or in adjacent tissues when flowering commences in the spring. Once leaves have dropped, very little movement of nutrients from the soil to the plant occurs. In almonds, cherries, stone fruit, and blueberries, flowers emerge before the foliage, so postharvest fertilizer applications in the prior season are the best opportunity to support flower and early leaf nutrition. Strong nutritional support early in the season can make a difference at harvest.

"With most perennial tree crops, there is a natural thinning, where the plant drops fruit. Maybe it was genetically defective or wasn't pollinated; there are a variety of reasons," Jacobs says. "The tree also drops what it can't support. The thought has always been, 'That's just what happens.' However, it certainly makes sense that there is a percentage that wouldn't have been dropped if the tree had sufficient carbohydrate reserves during dormancy and the early part of the season."

The formulation of the nutritional application is just as important as the nutrients in it. Agro-K's Sysstem LeafMax (0-20-0) or Zinc Plus+5 D.L teamed with Agrobest (0-20-26) are postharvest foliar applications formulated for easy plant uptake.

"Our products are true solutions – not suspensions or emulsions," says Nick Lucchesi, Northern California Sales Manager at Agro-K. "This is important so they can easily penetrate the leaf cuticle and are readily available to the plant. They are phosphites or dextro-lac sugars, which take very little energy for the plant to metabolize. Many foliar products are not true solutions, which means if they dry on the leaf, they just sit on the surface and are not absorbed. If you take a tissue sample, it will look like they are in there, but they haven't been absorbed."

For this reason, Lucchesi also recommends Sap Analysis (like a blood test for plants) from NovaCropControl, for a true measure of the nutrients circulating within the plant. "As a company, we are really focused on sap analysis, because we want to have the most accurate insight into the plant's nutritional status," he says. "We will never tell a grower to just spray something on 'just in case,' because that costs money and can actually cause damage. At the same time, you don't want to be deficient, because that can impact yield and plant health as well. I know our products and how they work, and I can confidently say you will get a return on your investment with a postharvest foliar nutrition application."

Find out how to boost bud production and more at www.agro-k.com

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Cover crops and winter weed management: considerations for annual rotations in wet and dry years

By Sarah Light, Agronomy Advisor, UCCE

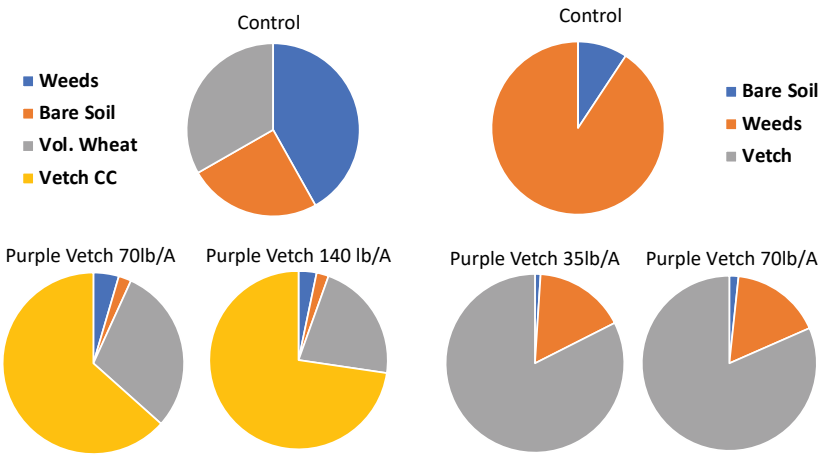
Cover crops are planted in ground that is otherwise fallow. Thus, cover crops can outcompete weeds that would grow in the same season in many situations. Cover crops have to establish well to be competitive. This can be challenging in a drought year. This article presents some of the considerations for weed management based on observations from various cover crop trials in the Sacramento Valley. In addition to weed reduction, cover crops provide a range of other soil health benefits and management considerations that will not be discussed in this article.

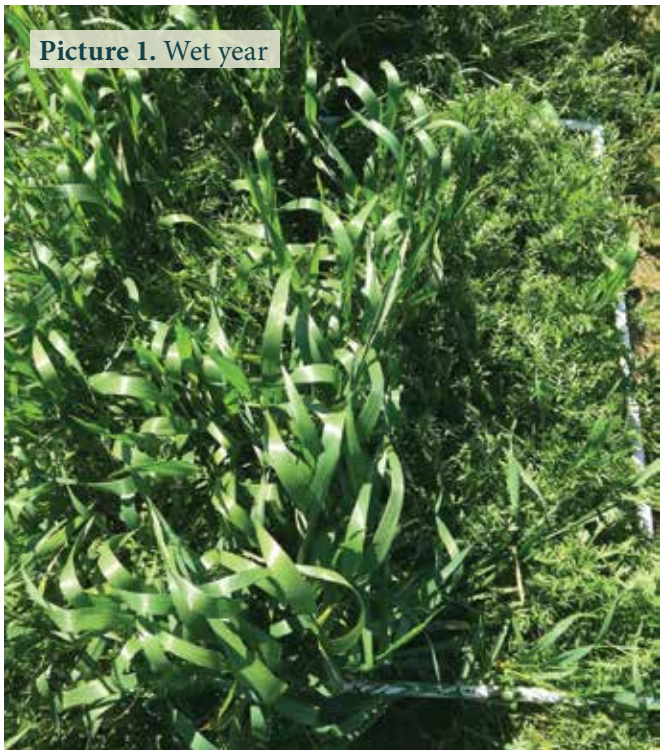
Some of the benefits of cover cropping, including increased water infiltration, reduced runoff, and increased organic matter, can be achieved by leaving winter weeds uncontrolled in the field. However, this can lead to increased weed pressure in the long term if the weeds go to seed and are introduced into the field. Some growers report up to a $65/acre savings in material, gas, and labor costs with planting winter cover crops as compared to using winter herbicide sprays to maintain a fallow field free of weeds.

Wet vs dry years, and an early planting date:
Competition with weeds can be maximized by planting cover crops early, before the first fall rain. Planting early also allows cover crops to take advantage of the longer fall days, as growth slows during the short, cold, winter days. Early planting will also allow cover crops to take advantage of all precipitation for the season and to get a head start in canopy development ahead of weeds.

For example, in two years of data from a trial in the Sacramento valley, a drill-seeded vetch cover crop was able to effectively suppress weeds in both a wet and dry year (Figure 1 and pictures 1 and 2). In year one, it rained 16 inches between November and March when the cover crop was in the ground. In addition, the field had come out of wheat and there was a lot of volunteer wheat in the field that acted like a cover crop mix with the vetch. The vetch and wheat combined were very effective at outcompeting weeds and providing soil coverage. In year two, seeding rates were cut in half from the previous year. It was a very dry year, with a total of only 6 inches of precipitation during the cover crop season. However, of those 6 inches, 4.7 inches of rainfall occurred in November and December. There was no volunteer wheat in year two, and despite the lower seeding rate, this early season precipitation enabled the vetch cover crop to thrive, and out compete weeds, even though the rest of the winter was very dry.

Figure 1. *Left*, year one, 16" rain total. *Right*, year two, 6" rain total, but 4.7" in Nov and Dec.

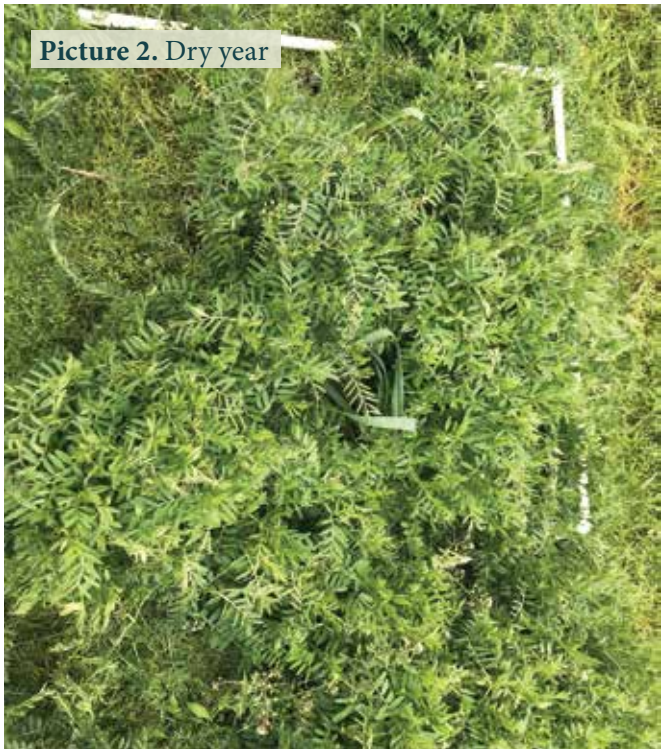




Picture 1. Wet year

If you cannot plant before the first rain you can terminate—either with mechanical cultivation or herbicide spray—the weeds that emerge after the first rain before planting the cover crop. This is more work but can also give cover crops a competitive advantage over emerged weeds. Irrigation at planting can also give the cover crop a competitive advantage, though prioritization of water for cover crops is unlikely given our current water situation.

Plant Family:
In replicated research plots with white mustard, triticale, safflower, and a fallow control, mustard and triticale were the most effective at outcompeting weeds (Figure 2, pictures 3 and 4) despite very low early season precipitation (a little more than one inch of water by the end of the year). In addition, small plots were planted of various cover crop species in 7 locations in the Sacramento Valley. It was hard to get consistent seeding with the single plot planter and it was a very dry year, leading to poor emergence for many species. However, across all sites, brassicas were consistently the most competitive with weeds closely followed by grasses. Legumes were less competitive with weeds because they did not close canopy as fast. Legume growth accelerates as days get longer in late winter, providing an opening for weeds to



Picture 2. Dry year

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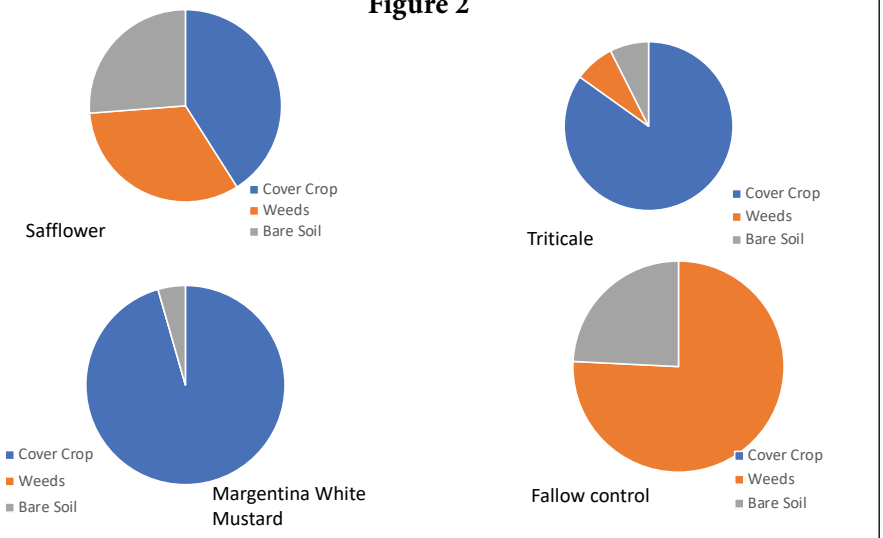
Figure 2



Picture 3

Picture 4

Picture 5

flourish in the colder winter months before the legume has closed canopy. It can be difficult for legumes to catch up later in the season if weed pressure is heavy. Full results can be found on the Sutter-Yuba Field Crops Cooperative Extension website.

Fluke years, and considerations for when things go wrong:
During one project year, fallow control plots were maintained free of winter weeds with a mix of several herbicides. Treatment plots that had the cover crop in them were not sprayed with this tank mix as the cover crops were actively growing. Cover crop plots were sprayed with glyphosate in early March to terminate the cover crop stand, and then the field was chopped. However, there was glyphosate resistant mallow in the field that was growing within the cover crop stands. Thus, when the cover crop was terminated, the young mallow plants continued to grow. The field was planted into sunflower, which has very limited broadleaf herbicide options. The cover cropped areas of the field had to then be hand weeded to remove the glyphosate resistant mallow. In the cover cropped plots there was significantly more mallow than in the fallow control plots and the grower estimated hand weeding costs to be about $80/acre in those portions of the field. Glyphosate can be effective as a chemical termination for cover crops, but care should be taken if there is a history of resistant weeds in the field. Cover crop management, like all farm management practices, need to be adjusted according to the field history, cropping system and year.

Summary and final considerations:
When managing winter cover crops with weed control in mind, a few key considerations must be kept in mind. The history of the field and the existing weed pressure will play a big role in how many weeds germinate and develop in the field. Successful and robust cover crop stand establishment is key for success as cover crops must outcompete weeds in order to effectively suppress them.

ADVERTORIAL

UNIVERSITY OF CALIFORNIA STUDY SHOWS BENEFITS OF SEAWEED-BASED BIOSTIMULANTS FOR WATER USE EFFICIENCY IN ALMOND TREES

Water deficit is one of the most common stresses in crop production globally. A University of California study into water use in almond growing, sponsored by Acadian Plant Health™, has announced its preliminary findings. The results show the benefits of seaweed-based biostimulants for water use efficiency, offering promising news for growers in drought-affected growing regions in the United States and around the world.

In 2021, the study found applications of Acadian® Organic, a seaweed-based biostimulant from Acadian Plant Health, can help reduce plant stress when water supply is limited, and when deployed properly, can combat negative changes in plants and on productivity caused by drought.

California is home to more than 1.33 million acres of almond orchards, and water use continues to be hotly debated in the region. While the local almond industry aims to reduce its own consumption of water by 20% by 2025, causing many to look for new ways to grow their crop with limited water.

The findings of the UC team – led by extension specialist Dr. Giulia Marino at the 350-acre Kearney Agriculture Research and Extension Center, the University of California's largest off-campus agricultural research facility – are exciting news for growers looking for sustainable and effective agricultural solutions in the face of increasing drought challenges.

Dr. Marino's team found that biostimulant treatments show promise in providing a tool for growers in their water management efforts, by increasing the plant system's resiliency and reducing crop productivity losses due to drought stress.

The research group made weekly assessments of midday stem water potential, fresh weight, dry matter content, and weighed nut yield at harvest to determine occurrence and response to summer drought stress. Applications of Acadian Organic delivered significant improvements in stem water potential and increased tree water status in fully and deficit irrigated trees throughout the season, showing increased kernel weight, both fresh and dry.

Results from the study, still ongoing, demonstrate the strong potential of seaweed-based biostimulants in countering environmental stress, and as an aid in avoiding crop production losses. Acadian Plant Health continues to work alongside its partners to offer solutions for growers in drought-affected areas and study multiple crops where its seaweed-based biostimulants have positive effects. The company is focused on building its portfolio of complete solutions for crop abiotic stress management worldwide.

Acadian Plant Health

For more information on Acadian Plant Health's innovative crop care solutions, visit **AcadianPlantHealth-NA.com**

"Water, or the lack of it, will continue to have a major impact on the agricultural industry for years to come. Managing abiotic stress with scientifically proven products has never been more important to growers. Biostimulants are well-known to be effective on preventing stress in crops and in helping provide growers a better return on investment. That's why Acadian Plant Health continues to make significant investments into fundamental and applied research, like that carried out by Dr. Marino and her team, to advance the science of our products."

Holly Little, *PhD, Director of Research and Development, Acadian Plant Health*

"As environmental and regulatory water restrictions challenge global agriculture, adopting multidisciplinary and holistic water management will be key to sustaining future orchard systems. These preliminary results suggest Acadian Plant Health's *Ascophyllum nodosum* extract has a positive effect on almond tree water status under experimental conditions, and may reduce tree stress. Additional research will help determine the product's impact on orchard productivity, as well as tree physiology and productivity."

Giulia Marino, *PhD, Department of Plant Sciences, UC Davis*

Thus, planting before the first rain to ensure rapid canopy development can help. Legumes generally are less effective at suppressing weeds when there is heavy weed pressure in a field. However, a mix with small grains (even volunteers) and legumes may be effective as the small grains can reduce early season weed pressure as the legume is taking off. Finally, cover crops (particularly brassica family like mustards) can become weeds in the field if they set seed. Some growers, especially organic growers, have stayed away from brassicas for this reason. Cover crops should be terminated before they set viable seed to avoid creating more weed pressure in the future. If timely cover crop termination is not an option for whatever reason (weather, equipment access, timing, cover crops are in a mix and actively growing), a high mow can be effective at cutting off flowers or seed heads from brassicas before they become viable. Termination can be delayed to a later date without risk of introducing new weeds to the field.

Though cover crop management, like all farm operations, may be variable from year to year, and expected challenges may arise, winter cover crops are generally effective at suppressing winter weeds and bring other additional benefits to the field. Please contact Sarah Light, selight@ucanr.edu, for more information.

Thank you to the CDFA Healthy Soils Program for funding this research and to our grower collaborators, without whom the work would not be possible. ■

Picture 6. Unirrigated black mustard - closed canopy; **Picture 7.** Unirrigated yellow pea - mostly weeds

IMPROVE DISEASE CONTROL WITH MULTIPLE MODES OF ACTION

Marrone® Bio Innovations

Fungal diseases are perhaps the most problematic and increasingly difficult diseases to manage on farms today. As resistance becomes a concern, growers are continually searching for new tools to help manage powdery mildew, downy mildew, *Botrytis*, *Fusarium* and more.

A UNIQUE BACILLUS WITH MULTIPLE MODES OF ACTION

In late 2021, Marrone Bio Innovations received regulatory approval in California for an expanded label of Stargus® Biofungicide, a unique *Bacillus* strain with multiple modes of action including induced systemic response (ISR) and systemic acquired response (SAR).

"The natural chemistry that is produced during the fermentation of Stargus helps prevent pathogen infections," states Melissa O'Neal, PhD, Marrone Bio's Senior Product Development Manager for the Western U.S. "We have also observed that, once applied, Stargus produces living spores, thereby creating a protective shield and preventing pathogens from accessing the plant."

Stargus Biofungicide (FRAC Code BM 02) is recommended at 1-4 quarts per acre and is exempt from maximum residue level requirements (MRLs), giving growers flexibility with how they schedule labor and applications. The unique *Bacillus* has a zero-day pre-harvest interval (PHI) and a four-hour worker re-entry interval (REI). Used alone, Stargus requires minimal personal protective equipment making it a safe product for pesticide applicators.

ROTATING MODES OF ACTION FOR INCREASED CONTROL

Integrated pest management programs often encourage the rotation of products for improved control. It's important for growers to be aware of the importance of using not only a variety of products but also various modes of action. With Stargus' FRAC Code BM 02, growers have a new and unique tool to help manage disease and reduce the likelihood of fungicide resistance.

STARGUS® BIOFUNGICIDE

ACTIVE MOLECULES

Natural chemistry produced during the fermentation process prevents pathogen infections

INDUCED SYSTEMIC RESISTANCE/ SYSTEMIC ACQUIRED RESISTANCE

Stargus boosts the innate ability of the plant to defend itself, preventing pathogens from taking a foothold on the crop

PROTECTIVE SHIELD

Living spores develop and colonize the parts of the plants that are treated and form a shield preventing pathogen access to the plant

Downy mildew can be devastating to many crops, like leafy greens and grapes.

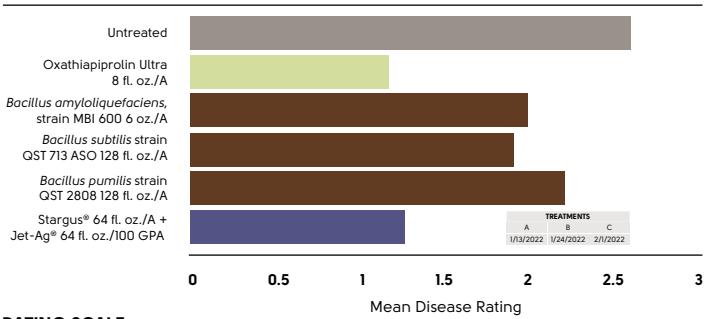
"We have seen impressive control of some of the most problematic diseases, such as downy mildew in leafy greens, when Stargus is used with Jet-Ag 5%," added O'Neal.

Jet-Ag 5%, a broad spectrum peroxyacetic acid (PAA), prevents, suppresses, eliminates, and controls algae, fungi, and bacterial diseases in agriculture and horticultural industries. It has been shown to boost fungicide performance when used in a tank-mix or as part of a rotation.

"As pesticide resistance becomes a growing concern, especially for diseases like powdery mildew, we are strongly advising growers to always rotate not just the product but the modes of action they are using. In most cases, the more modes of action one uses, the better control one will have, and we have seen this when Stargus is used with Jet-Ag 5%."

MBI FUNGICIDES AGAINST LETTUCE DOWNY MILDEW

Dr. Poudel-Ward, U of AZ • Variety: Magosa



RATING SCALE

0	No Mildew Present	3	Mildew on Bottom Leaves and All Wrapper Leaves
1	Mildew on Bottom Leaves of Plant	4	Mildew on Bottom Leaves, Wrapper Leaves, Cap Leaf
2	Mildew on Bottom Leaves and Lower Wrapper Leaves	5	Mildew on Entire Plant

All treatments applied three times.

Stargus Biofungicide is approved for a wide range of foliar and soil-borne diseases on a variety of California crops: leafy greens, brassica, cucurbit and fruiting vegetables, citrus, pome and stone fruits, berries, tree nuts, cereal grains, and more. Please see label at www.MarroneBio.com/Products/Stargus for full list and instructions for use.

**Always read and follow label instructions.*

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University of California Cooperative Extension

Response of California rice varieties to stem rot and aggregate sheath spot, two common tiller diseases

Luis Espino, Rice Farming Systems Advisor, UCCE, Butte and Glenn Counties
Whitney Brim-DeForest, Rice Farming Systems Advisor, UCCE, Sutter, Yuba, Sacramento, and Placer Counties

Stem rot and aggregate sheath spot are common fungal diseases of rice in California. One can find symptoms of both diseases in most fields (figures 1 and 2). For example, in 2019 we conducted a survey of 162 rice basins in eight rice producing counties and found that 65 and 39% of samples showed stem rot or aggregate sheath spot symptoms, respectively.

Trials conducted in the past few years have shown that when incidence of these diseases is severe, yield reductions can be as high as 12 to 14%. Stem rot seems to be the disease that causes more problems. Under high stem rot pressure, plants senesce quickly after draining for harvest, resulting in panicles with a large proportion of empty grains. When aggregate sheath spot is severe, leaf sheaths burn and leaves turn yellow, starting at the water level and moving up the tiller as the season progresses. In extreme cases the panicle can be affected; however, this rarely happens under our conditions.

Figure 1. Tiller with stem rot symptoms. Lesions start at the water level and penetrate the tiller as they get more severe.

Several factors influence the incidence (now many plants are infected) and severity (how bad the infection is) of these diseases. The inoculum for both pathogens survive in the straw, so straw burning or good straw decomposition can reduce the amount of inoculum in the soil. Excess nitrogen promotes stem rot, while potassium deficiency can favor both stem rot and aggregate sheath spot.

Fungicides can play a role in managing these diseases. Azoxystrobin can significantly reduce the incidence and severity of the diseases when applied at full rate at the mid boot to early heading stage. Applications at propanil timing (35 to 40 days after seeding) are not effective.

A common question growers have is how different varieties respond to the diseases. The information we had available was that all varieties were similarly affected by both diseases. Because of the release of several new varieties in the past few years, we thought it was time to revisit varietal

Figure 2. Leaf sheath covered with aggregate sheath spot lesions. Notice how the leaves associated with the affected leaf sheaths turn yellow.

Table 1. Varieties used in stem rot and aggregate sheath spot variety trials. Days to 50% heading is the average from trials conducted at the Rice Experiment Station (RES) during 2017, 2018, and 2019.

Variety	Grain type	Maturity	Days to 50% heading at RES
CM-101	Specialty (Glutinous)	Very early	73
S-102	Short	Very early	72
M-105	Medium	Very early	72
M-206	Medium	Early	74
M-209	Medium	Early	81
M-211	Medium	Early	82
L-208	Long	Early	74
A-202	Long	Early	77

Table 2. Stem rot and aggregate sheath spot disease severity scale.

Scale	Stem rot	Aggregate sheath spot
0	No disease	No disease
1	Disease lesions on outer leaf sheath	Disease affecting second leaf below flag leaf or lower
2	Disease lesions have penetrated into inner leaf sheaths	Disease affecting leaf below flag leaf
3	Disease lesions on culm	Disease affecting flag leaf
4	Culm is rotted though	Disease affecting panicle

response. Therefore, we conducted a variety trial in 2021 with eight common rice varieties in fields with a history of stem rot or aggregate sheath spot. Azoxystrobin treated and untreated plots were included.

The varieties included in the trials are shown in table 1. At early heading, that is, when the first panicles were visible over the canopy, azoxystrobin was applied to the treated plots at the highest label rate. To determine the incidence and severity of the diseases, tiller samples were taken at drain time and rated on a scale from 0 to 4, as shown in table 2.

Average stem rot incidence and severity in untreated plots for all varieties was 96% and 2.3, respectively. There were some significant differences among varieties, with varieties M-209, M-211, and A-202 showing the lowest levels of stem rot, and varieties S-102, CM-101, and M-105 the highest (figure 3). All varieties benefited from the application of the

fungicide. On average, application of azoxystrobin reduced stem rot severity from 2.3 to 1.6, a 30% reduction. This reduction resulted on an average yield increase in treated plots of 357 lbs/a, or 4% higher than untreated plots.

Comparing stem rot severity levels with days to reach 50% heading for each variety, a trend emerged showing that varieties with shorter times to heading develop higher stem rot severity than varieties with longer times to heading (figure 4). This result was unexpected; we thought that varieties that develop faster would show less stem rot because the pathogen would not have as much time to develop. Perhaps plant size and tiller diameter play a role in how the plant reacts to stem rot infection.

In the aggregate sheath spot trial, disease levels were low (figure 5). Average incidence and severity in untreated plots were 79% and 1.2, respectively. There were some differences between varieties, but they were not as marked as with stem rot. Varieties A-202, L-208, M-206, and M-211 had the lowest disease levels; CM-101, S-102, M-105, and M-209 the highest. The effect of the fungicide on aggregate sheath spot incidence and severity was striking, reducing them by 53 and 67%, respectively. However, for all varieties except CM-101, there was no benefit of the fungicide on yield, most likely because disease levels were not high enough to cause a yield reduction. In the case of CM-101, there was a 4% yield increase due to the treatment. CM-101 may be more susceptible to the disease than the other varieties tested.

How can this information be incorporated into a disease management program? For stem rot, growers using varieties with the potential to develop higher stem rot disease like S-102, CM-101 or M-105, can take proactive steps to reduce the risk of disease or plan on using a fungicide when fields have a history of stem rot. In the case of aggregate sheath spot the results are not so clear cut, but our trial shows that CM-101 would benefit from a fungicide application even at low disease levels. We will repeat the trials again in 2022 to confirm our observations. ■

Figure 3. Stem rot severity score in untreated plots.

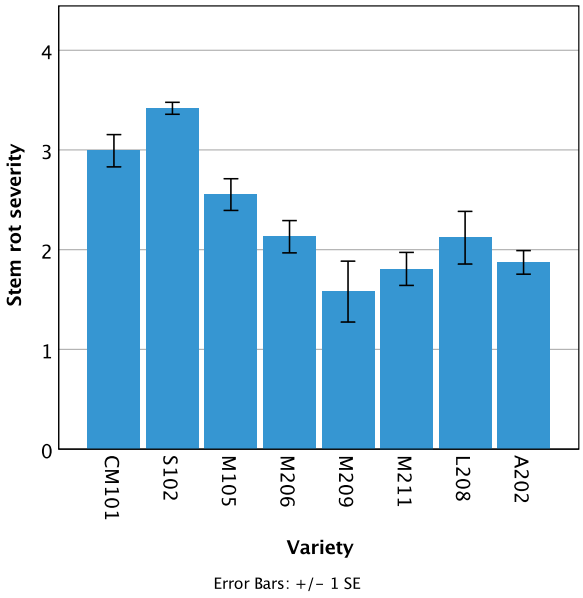


Figure 4. Stem rot severity score in untreated plots and days to 50% heading.

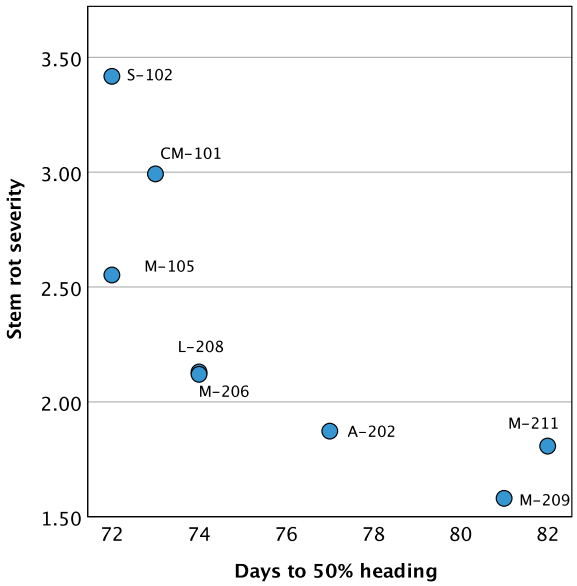
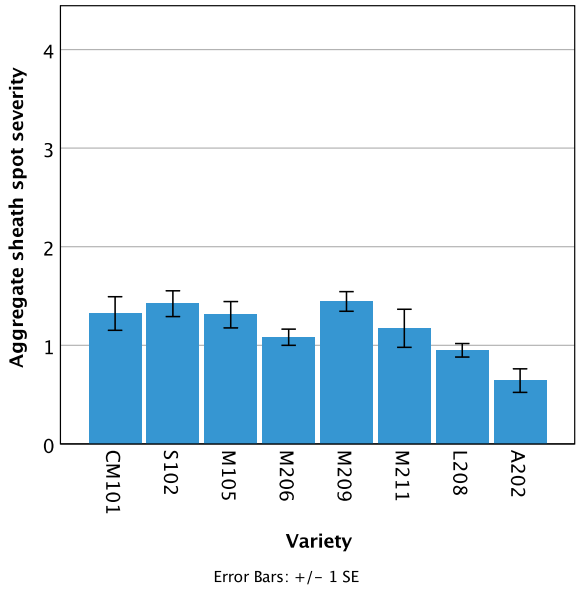


Figure 5. Aggregate sheath spot severity score in untreated plots



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As the number one walnut producting state in the country maximizing harvest on every California acre is critical. **Buzz Ultra DF**® has helped growers prevent disease such as Botryosphaeria panicle and shoot blight in walnuts. **Buzz Ultra DF** (Dry Flowable) has one of the highest percentage of active ingredient – 75% tebuconazole - on the market. **Buzz Ultra DF** goes into solution quickly and its systemic activity helps prevent and control disease. Barry Morrell, PCA and VP of Colusa County Farm Supply states; *"Buzz Ultra is a great addition to our tool box when it comes to treating Botryosphaeria in walnuts. Growers really like the value they get in the product with the higher active ingredient content and the ease of use for their applications with the dry formulation. Not to mention its much easier to store than a liquid!"*

Belchim also provides California growers with an OMRI listed 80% micronized sulfur product **Cosavet DF Edge**®. **Cosavet DF Edge** is dust free, provides superior contact and vapor action, as well as exceptional dispersion and suspension. It provides broad spectrum activity on Powdery Mildew on a variety of California crops such as grapes.

UNICORN DF® is an advanced, broad spectrum premix fungicide containing tebuconazole (4.5%), a Triazole group systemic fungicide that is absorbed and trans-located, and sulfur (70%), a non systemic fungicide that works through contact and vapor action. **UNICORN DF** can be used as part of a preventative or a curative fungicide program.

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Water is continually a topic of discussion throughout the state. Snow and rainfall amounts, in addition to restrictions and regulations from the California Department of Water Resources, can impact irrigation timing and quantities needed by most crops. Often water that is available to plants does not always get to its intended target, the rootzone. Therefore, the chemicals being carried in that water will not get there either. In addition, the lack of proper water movement into the soil can impact the ability for plants to thrive. **Integrate**® **80**+ Soil Surfactant, with active ingredient 83% Tri Block Co Polymer, ensures maximum uptake of water on hydrophobic soils. It provides uniform penetration and lateral movement of water encouraging improved rooting and nutrient uptake leading to greater plant health and uniformity.

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University of California Cooperative Extension

Improving diamondback moth pest management in California

Ian Grettenberger, Oleg Daugovish, Daniel Hasegawa, Paul Rugman-Jones, Diego Nieto, Ricky Lara

Introduction

California leads the nation in the production of broccoli, cauliflower, and cabbage for fresh and processing markets. However, a small, drab brown moth, with similarly unremarkable green caterpillar larvae, hinders this production of brassica crops (Fig. 1, Fig. 2). This challenging pest is the diamondback moth (DBM), *Plutella xylostella* (Lepidoptera: Plutellidae). Worldwide, DBM is a severe pest of an array of cruciferous vegetables, costing growers an estimated $4-5 billion to manage (Zalucki et al. 2012). With contradictory claims of old- and new world origins, DBM was first detected in North America in 1854 (Illinois, USA) (Fitch 1855), although it is now a widespread seasonal pest throughout the continent. The larvae of this destructive pest feed exclusively on plants in the brassica family (Brassicaceae), which includes many crops and some noxious weed species (e.g., mustards). While DBM is a naturalized species with 150+ years of documented occurrence in the U.S., an economical solution for its management is still lacking. Furthermore, its threat to cole crop production has recently worsened, particularly in California.

DBM Situation in California

California has been facing increasing crop damage issues with DBM. In particular, California's Central Coast and desert production regions provide very favorable environments. The warm climate and abundance of cole crop hosts enable DBM to complete its development in as little as 3 weeks, facilitating multiple generations and building populations over a single cropping cycle. The Central and South Coast has areas with year-round populations of DBM, which cause damage ranging from low levels to complete crop loss. DBM pressure has worsened over the past decade, increasing management costs and threatening the competitiveness of cole crop production. In some areas (e.g., Ventura and Santa Barbara Counties), management has not been cost-effective due to widespread insecticide resistance, limited rotational opportunities, and year-around availability of preferred DBM hosts.

Current IPM Challenges

Current management for DBM relies heavily on insecticides. Thus far, cost-effective alternative management strategies to support an integrated management approach have not been developed and adopted. These may include area-wide mating disruption, mass trapping/attract-and-kill, trap crops,

Figure 1. Diamondback larvae, pupae, and adult. Note the newly hatched, first instar larvae near the larger, late-instar larva. The pupa is inside the cocoon it has spun. Near the pupa are DBM eggs. Photos: I. Grettenberger

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Figure 2. Brassica crops like this cauliflower are often at risk of damage by diamondback moth.

or use of varieties with improved tolerance to DBM damage. Unfortunately, insecticide resistance threatens the viability of current management approaches reliant on insecticides. DBM has one of the strongest track records among pests for insecticide resistance. Worldwide, it has developed resistance to more than 90+ active insecticide ingredients, covering all major classes, and including those used heavily in California [John Palumbo, pers communication]. While insecticide resistance (demonstrated through laboratory bioassays) and control failures have occurred for some compounds in the Salinas Valley, resistance issues have been more pronounced in Ventura County, where DBM was resistant to several key insecticidal modes of action. As materials become less effective, tools are lost from the proverbial toolbox, management costs can become prohibitively high, and more pressure is placed on the materials that remain effective.

Biological control

Heavy insecticide use in brassica crops has not been conducive to sustained control by natural enemies. As a consequence, incorporating such natural enemies into long-term DBM control remains a recurring challenge in conventional systems. Nevertheless, globally, more than 100 species of parasitic Hymenoptera have been recorded attacking the eggs, larvae, and pupae of DBM life stages. Parasitoid communities and success of biological control vary across geographic regions (Delvare 2004). Several members of the families Ichneumonidae (e.g., *Diadegma* spp., *Diadromus* spp.) and Braconidae (e.g., *Cotesia plutellae, Microplitis plutellae*) are regarded as key natural enemies, due to their biology, ecology, and relatively high levels of DBM parasitism in the field (Delvare 2004). In North America, *Diadegma insulare* (Fig. 3) is widely distributed and considered one of the most important native parasitoids attacking DBM larvae (Oatman and Platner 1969; Fox 1990; Shelton 2004). However, in California, there remain opportunities to diversify the complex of natural enemies and improve integration of biological control practices into management programs, including via importation and release of new parasitoid species.

Figure 3. *Diadegma insulare*, one of the most common and effective native parasitoids that attacks DBM in North America. This female (obvious due to ovipositor) is searching for DBM larvae to parasitize. Photo: I. Grettenberger

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New research on DBM

A Specialty Crop Block Grant Proposal to conduct research on DBM was recently awarded to several of the authors and has come at a critical time. The project is a collaboration between researchers with University of California, USDA – Agricultural Research Service (USDA-ARS), and California Department of Food and Agriculture (CDFA) and backed by support from industry cooperators and stakeholders. Additional work on DBM management is also being conducted by University of California and USDA-ARS researchers. Altogether, this research seeks to strengthen California's integrated DBM pest management program by providing growers with an array of long-term monitoring and management solutions.

Monitoring DBM populations via pheromone traps

Monitoring is one of the key components of an IPM program. One of the first objectives of the project is to monitor DBM populations across the Salinas Valley. Pheromone baited traps that attract adult male DBM will be used to assess regional population trends and supplement in-field scouting for larvae. This project, led by USDA-ARS in Salinas, will report DBM population data on a weekly basis throughout the year. Continuing this work (previously led by UC Cooperative Extension in Monterey County) will help compare current population trends to prior years, which is valuable for identifying population shifts over seasons.

Similar DBM adult trapping was initiated in Ventura County in 2022 (Figure 4). Here, traps were placed in non-crop area near fields with host crops. Similar to the Salinas trap network, the goal is to track area-wide population trends for this key production area. The goal is also to provide information that could be used to time plantings and avoid high-risk pest areas when planting open-field nursery or production cole crops.

Assessing insecticide resistance

Insecticide resistance in DBM has been well documented globally, and resistance is also occurring in California populations. However, quantifying and identifying the scope of resistance will help improve resistance management strategies and get industry on a more sustainable path. Work led by UC, but with a support network including research and industry collaborators, will use laboratory bioassays to quantify insecticide resistance for populations of DBM across California. Field populations of DBM larvae will be obtained from different growing regions and exposed to insecticides at varying insecticide concentrations using a leaf dip bioassay. These experiments will help determine the levels of resistance among DBM populations for each insecticide. For populations no longer susceptible to a specific insecticide, this information will help quantify the extent of resistance.

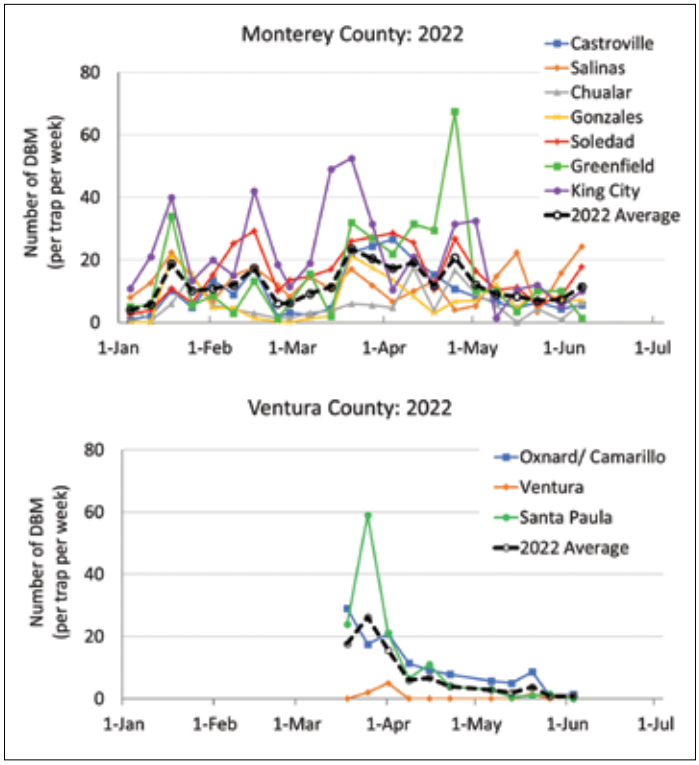

Figure 4. Diamondback moth captures in Monterey County (Salinas Valley) and Ventura County in 2022. Counts represent the number of DBM per sticky card, per week and are presented as an average across multiple traps for each location. Averages across locations (all traps) for a county are presented as a dashed black line. Monterey County traps are run by. D. Hasegawa and Ventura County traps by O. Daugovish.

Developing biological control

Classical biological control efforts are led by CDFA, UC, USDA-ARS, and industry. We are focused on finding specialized (host-specific) parasitoids that: (1) co-evolved with DBM in its native range; (2) can establish in California; and, (3) can enhance DBM parasitism in the field. UC Riverside is using molecular tools to genetically "profile" DBM populations in California, which will hone in on their likely geographic origin. The results will guide foreign exploration activities in Europe and Africa by the USDA-ARS European Biological Control Lab to find co-evolved, climate-compatible natural enemies that may be suitable for DBM control in coastal and inland regions of California. Following the identification of such natural enemies and prior to any introduction into the U.S., each potential control agent will undergo rigorous host-specificity testing in a quarantine facility as required by USDA-APHIS. One of the candidate agents is expected to be *Diadegma semiclausum*, a co-evolved DBM parasitoid from Europe that has been introduced successfully in multiple countries (Delvare 2004).

In Ventura County, UC researchers have been testing entomopathogenic nematodes in a controlled setting. Nematodes were observed entering and killing DBM larvae and pupae after they were applied as a spray. These nematodes may have difficulty surviving in production fields, but may be useful in transplant production, especially when sprinklers are used and under protective structures.

Conclusion

DBM remains a primary economic pest in California brassica fields. Through the various collaborative research efforts of this team, along with other researchers across the US and world, we aim to advance integrated pest management of this pest. DBM is a difficult pest to manage, but additional information and a greater breadth of management tools will maintain viable management programs for the benefit of California farmers. ■

References:

Delvare, G. 2004. The taxonomic status and role of Hymenoptera in biological control of DBM, *Plutella xylostella* (L.) (Lepidoptera: Plutellidae), pp. 17-49. *In* Improving Biocontrol of *Plutella xylostella* (eds. A.A. Kirk and D. Bordat). CIRAD, Montpellier, France.

Fitch, A. 1855. Infesting garden vegetables, pp. 170-175. *In* First report on the noxious, beneficial, and other insects of the state of New York. C. Van Benthuysen, Albany, NY.

Fox, L.R., D.K. Letourneau, J. Eisenbach, and S. V. Nouhuys. 1990. Parasitism rates and sex ratios of a parasitoid wasp: effect of herbivore and plant quality. Oecologia 83: 414-419.

Oatman, E.R., and G.R. Platner. 1969. An ecological study of insect populations on cabbage in Southern California. Hilgarida 40: 1-40.

Shelton, A. M. 2004. A brief review of diamondback moth biological control in North America, pp. 93-101. *In* Improving biological control of *Plutella xylostell*a (eds. A. A. Kirk and D. Bordat). CIRAD, Montpellier, France.

Zalucki, M.P., Shabbir, A., Silva, R., Adamson, D., Shu-Sheng, L., and Furlong, M.J. 2012. Estimating the economic cost of one of the world's major insect pests, *Plutella xylostella* (Lepidoptera: Plutellidae): just how long is a piece of string? J Econ Entomol 105: 1115–1129.

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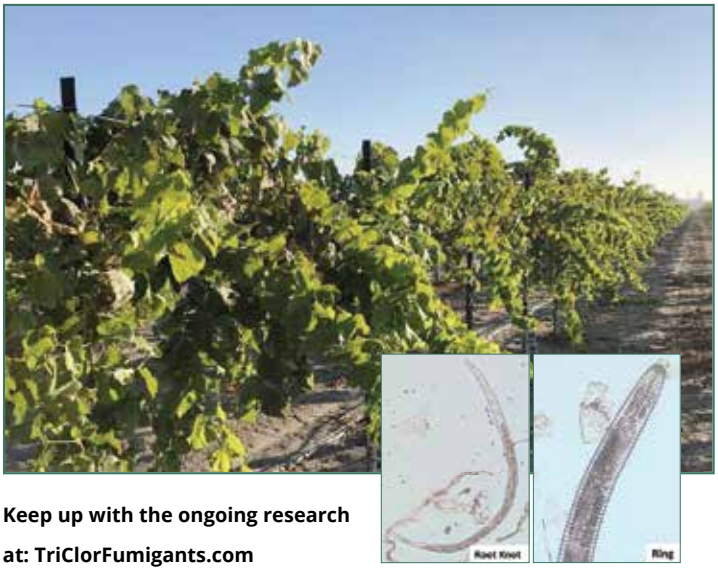

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Photo: Justin Dellinger

How growers can coexist with Southern California mountain lions

By Sonia Rios, Subtropical Horticulture Farm Advisor, Riverside and San Diego Counties

The relationship between humans and animals has always been one with elements of conflict, and as the number of people on the planet continues to increase, the relationship is becoming more strained and unbalanced. Turning California into a global agricultural powerhouse has created growing challenges to natural ecosystems and wildlife that once thrived in fertile places like Southern California. Due to the increase in wildfires, drought and rapid loss of habitat by development, many coyotes, bobcats, deer, rats, mice, rattlesnakes and mountain lions have found themselves forced to cohabit with humans. Mountain lions have ventured into neighborhoods and agriculture properties to find food and water, and in certain instances, human-wildlife conflicts develop.

Biology

Mountain lions (*Puma concolor*), also known as pumas and cougars, are large, powerful predators that have an important role in the ecosystem and are the most widely distributed carnivore in the Western Hemisphere (Allen 2015). The mountain lion has a small head and small rounded ears. It has a very long tail that is about 2/3rds the length of its body. Fur color is generally tan, but can range from gray to brown with a whitish underside. The ears and tail are tipped with black. Cubs have camouflage spots that fade as they mature. Adult males can reach eight feet in length from nose to tail; and weigh 130-150 lbs. Adult females can reach up to seven feet in length and weigh 65-90 lbs. Unlike a dog, mountain lions don't leave a nail mark and their pads are shaped like an "M". Adult mountain lions are solitary and territorial animals. Males can have territories up to 100 square miles and females' territories can range up to 60 square miles (Smallwood 1994). They are most active between dusk and dawn, and generally avoid contact with humans. With long hind legs, mountain lions can jump 18 feet high and 40 feet forward. Mountain lions have excellent night vision but a poor sense of smell.

Potential Human-Wildlife Conflict

Mountain lion attacks on humans are uncommon. Statistically speaking, a person is one thousand times more likely to be struck by lightning than attacked by a mountain lion. Since 1986, there have been 19 verified attacks — three of them fatal (Taylor 2022). For an updated list of attacks in California, visit: https://wildlife.ca.gov/Conservation/Mammals/Mountain-Lion/Attacks.

Under the California Department of Fish and Wildlife (CDFW's) Public Safety Wildlife Guidelines, an animal is deemed to be a public safety threat if there is "a likelihood

of human injury based on the totality of the circumstances." Factors that are considered include the lion's behavior and its proximity to schools, playgrounds and other public gathering places. The determination of whether an animal is a public safety threat is made by the CDFW or local law enforcement personnel on the scene. If a wild animal is declared a public safety threat, protecting human health and safety is a priority.

In California, mountain lions prey primarily upon mule deer, but they can also prey on smaller animals like raccoons, rabbits, and if allowed, they will prey on unprotected pets and livestock. Approximately 20% of the total livestock predation losses in western states annually can be attributed to mountain lion predation (Smallwood 1994); however, these incidents can be prevented by making simple changes to housing and husbandry methods. Grower production practices and hand harvest can be delayed if there is a mountain lion sighting, as many workers will fear working in an area where they have been seen; however, with proper training and education, fear can be reduced dramatically, as mountain lions are typically solitary and elusive (California Department of Fish and Wildlife 2022).

In addition to potentially coming across a mountain lion, growers have to be aware of food safety procedures. If any wildlife residues, such as fecal material, come into contact with the marketable commodity, it can result in a hefty penalty for growers and producers, and can be dangerous to the consumer.

Management

In California, the harvesting of mountain lions is not allowed. The passage of the California Wildlife Protection Act of 1990 (Proposition 117) by California voters established that mountain lions are a "specially protected mammal" in California.

Chemical and Mechanical Methods

In California, it is unlawful to possess, transport, import or sell any mountain lion or part or product thereof (including taxidermy mounts). California does not allow the harvest of mountain lions and lethal methods are not used to manage mountain lion populations. Residents who encounter property damage from mountain lions can contact the Department of Fish and Wildlife (CDFW) for a depredation permit. There are no repellents, toxicants, or fumigants registered in California for mountain lion management.

Exclusion Methods

Exclusion is a preventative tactic that involves essentially, denying the unwanted animal access to a facility or area in the first place. Farmers should install heavy woven-wire or electric fences to protect livestock and domestic animals of high value. It also helps to install outdoor lighting to make it difficult for mountain lions to approach unseen, preferably sensor-activated lights.

Cultural Methods

Cultural controls are practices that reduce establishment, reproduction, dispersal, and survival - for mountain lions, deer-proofing and bringing pet food inside to avoid attracting raccoons, opossums to avoid attracting a lion's main food source. Guard dogs can be another deterrent for mountain lions, especially when they are placed in with livestock. Remove dense vegetation from around the home, work area and orchards to reduce hiding spaces. Managing weeds in the orchards needs to be a priority.

Living in Lion Country- If You Encounter a Mountain Lion

They typically pose little threat to humans and generally avoid any human interaction. They often coexist with people, unseen and unheard. More research is needed on how to avoid mountain lion attacks (Fitshugh 1986), but people who live in mountain lion habitat can take precautions to reduce their risk of encountering a mountain lion. According to the California Department of Fish & Wildlife (2022):

- **Do Not Hike Alone, especially between dusk and dawn, when lions normally do their hunting:** Go in groups, with adults supervising children. As a precaution, the use of isolated stairs and walkways at dawn, dusk, or in the evening is discouraged.
- **Keep Children Close to You:** Observations of captured wild mountain lions reveal that the animals seem especially drawn to children. Keep children within your sight at all times.
- **Do Not Approach a Lion:** Most mountain lions will try to avoid a confrontation. Give them a way to escape.
- **Do Not Run from a Lion:** Running may stimulate a mountain lion's instinct to chase. Instead, stand and face the animal. Make eye contact. If you have small children with you, pick them up if possible so they don't panic and run. Although it may be awkward, pick them up without bending over or turning away from the mountain lion.
- **Do Not Crouch Down or Bend Over:** In Nepal, a researcher studying tigers and leopards watched the big cats kill cattle and domestic water buffalo while ignoring humans standing nearby. He surmised that a human standing up is just not the right shape for a cat's prey. On the other hand, a person squatting or bending over looks a lot like a four-legged prey animal. If you're in mountain lion country, avoid squatting, crouching or bending over, even when picking up children.
- **Do All You Can to Appear Larger:** Raise your arms. Open your jacket if you are wearing one. Again, pick up small children. Throw stones, branches, or whatever you can reach without crouching or turning your back. Wave your arms slowly and speak firmly in a loud voice. The idea is to convince the mountain lion that you are not prey and that

you may be a danger to it.

- **Fight Back If Attacked:** A hiker in Southern California used a rock to fend off a mountain lion that was attacking his son. Others have fought back successfully with sticks, caps, jackets, garden tools and their bare hands. Since a mountain lion usually tries to bite the head or neck, try to remain standing and face the attacking animal.
- **Leave the Area if Lion is Spotted:** Do not approach a lion, especially if it is feeding or with its young. Most lions will avoid confrontation. Give them a way to escape. If a mountain lion is spotted while a grower or farm laborers are working in the field, it is best to carefully leave the area and return another day. It is also a good idea for farm workers to carry air horns to deter and scare off a mountain lion, giving workers a chance to leave the area safely.
- **Immediately Report All Encounters or Attacks:** If you are involved in a face-to-face encounter with, or an attack by, a mountain lion, call 9-1-1. The threat to public safety will be assessed and any appropriate action will be taken. Also report any sightings of dead or injured mountain lions to the California Department of Fish and Wildlife.

Whether you live in a city, rural, or remote areas of California, wild animals are our neighbors. As our human population grows and expands into wildlife habitat, human-wildlife interactions have increased (California Department of Fish and Wildlife, 2022). However, in some areas of California, mountain lion populations are facing stressors such as vehicle collisions, secondary poisoning from rodenticides, and loss of habitat. Certain populations of California's mountain lions are isolated in small pockets of fragmented habitat. Barriers, such as freeways and urban development, prevent young mountain lions from migrating in or out to establish their own home ranges and find mates. The resulting inbreeding and declines in genetic diversity have left some mountain lion populations vulnerable to extinction (Mountain Lions in California, 2022). In fact, some could disappear in just 15 years if inbreeding continues. With a better understanding of their nature, people can safely coexist with mountain lions and help these animals remain an important part of California's natural heritage. ■

Work Cited

Allen, M. L., L. M. Elbroch, D. S. Casady, and H. U. Wittmer. 2015. Feeding and spatial ecology of mountain lions in the Mendocino National Forest, California. *California Fish and Game*, 101(1), 51-65.

California Department of Fish and Wildlife. *Mountain Lions in California*. < https://wildlife.ca.gov/Conservation/Mammals/Mountain-Lion> Accessed 1 June 2022.

California Department of Fish and Wildlife website. < https://wildlife.ca.gov/Keep-Me-Wild/Lion> Accessed 29 June 2022.

California Department of Fish & Game. Living with California Mountain Lions pamphlet < https://sagehen.ucnrs.org/Documents/visitors/wildlife/lion.pdf > Accessed 23 May 2022.

Fitzhugh, E.L. and W. P. Gorenzel.1986. Biological status of Mountain lions in California. In *Proceedings of the Vertebrate Pest Conference*, 12 (12).

Moriarty, J. G., S. P. Riley, L. E. Serieys, J. A. Sikich,C. M. Schoonmaker, and R. H. Poppenga. 2012. Exposure of wildlife to anticoagulant rodenticides at Santa Monica Mountains National Recreation Area: from mountain lions to rodents. In *Proceedings of the Vertebrate Pest Conference*, 25 (25).

Riley, S. P., C. Bromley, R. H. Poppenga, F. A. Uzal, L. Whited, and R. M. Sauvajot, R. 2007. Anticoagulant exposure and notoedric mange in bobcats and mountain lions in urban southern California. *The Journal of Wildlife Management*, 71(6), 1874-1884.

Smallwood, K. S. 1994. Trends in California mountain lion populations. *The Southwestern Naturalist*, 67-72.

Taylor, N. 2022. How often do California mountain lions attack? Here's what to know if cougars are near. *Sacramento Bee* <https://www.sacbee.com/news/california/article261568352.html#storylink=cpyoccurred>. Accessed 6 June 2022.

Unknown. *Mountain Lions in California*. < https://wildlife.ca.gov/Conservation/Mammals/Mountain-Lion#562331251-how-do-i-live-and-recreate-safely-in-areas-with-mountain-lions > Accessed 23 May 2022.

Unknown. *Your Safety in Mountain Lion Habitat*. < https://www.nps.gov/pore/planyourvisit/yoursafety_mountainlions.htm > Accessed 23 May 2022.

THE FIGHT AGAINST MITES – STIFLE® WP ENABLES GROWERS TO PROTECT THEIR FIELDS

Mites can do some real crop damage if given a chance. Mite pressures can be unpredictable in the California landscape, but growers can handle whatever complications occur and protect their crops with a dependable pest management plan.

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How Does It Work?

By implementing Stifle WP into a pest management plan, growers receive effective protection against most common mite species such as various spider mites, Banks grass mites and European Red mites. Stifle WP targets all mite life stages – from eggs to maturity. It sterilizes adult females and their eggs, kills eggs on foliage and controls nymphs by inhibiting molting. Etoxazole, the active ingredient in Stifle WP, is a mite growth regulator that works by inhibiting chitin synthesis. Stifle WP is the only miticide in the insecticide resistance classification subgroup.

Stifle WP can be used on the following crops and crop groups: avocados, corn (field, popcorn and seed), cotton, cucurbits, grapes, mint, peppers and eggplants, pome fruits, strawberries, stone fruits, tree nuts and all other labeled crops.

How Should It Be Applied?

Growers can apply Stifle WP only once per season when mite populations are building up. However, two applications per season are allowed on corn. Horticultural oil or non-ionic adjuvant in the tank mix may increase efficacy due to better coverage and enhanced translaminar movement of the active compound.

Don't let mites impact your crop and yield. Talk to your local AMVAC rep to implement Stifle WP into your pest management plan. Visit **www.AMVAC.com** for more information.

Stifle® WP
MITICIDE

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Why ants are a pest in vineyards

Cindy R. Kron, North Coast IPM Advisor, University of California Statewide IPM Program and Cooperative Extension

Mealybugs are small, soft-bodied insects that are economic pests on a variety of crops in California (grapes, citrus, pistachio, avocado, pears, almonds, etc.). Predators and parasitoids naturally reduce mealybug populations below economic levels. When certain ant species interact with the predators and parasitoids of mealybugs and soft scales, ants can prevent naturally occurring biocontrol from being successful. Here is what you can do to prevent ants from disrupting biocontrol so that mealybugs and soft scales don't become pests in your vineyards.

Common pest species include vine mealybug, grape mealybug, obscure mealybug, longtailed mealybug, Gill's mealybug, and citrus mealybug. Each of these species have their own set of host crops in which some host crops are overlapping between different species. Adult females range between 2 to 5 mm in length, are wingless with a whitish waxy coating on their bodies and mostly sedentary. The first immature stage, referred to as "crawlers," are the most active life stage for dispersal, which can be achieved by hitchhiking on farm equipment, clothing of field crews, and birds, disseminated through nursery material, along with being blown by the wind, or simply crawling to new locations.

Mealybugs and soft scales on grapevines

Mealybugs and soft scales produce honeydew, a sugary liquid that is excreted by the insect when it feeds, that falls onto leaves and fruit. Black sooty mold uses the fallen honeydew as a food source to grow on the grapes resulting in off-characteristics in the wine produced with wine grapes and unmarketable fruit for table grapes. High-density populations can also result in reduced vine growth, bunch rots, and defoliation of the grapevine.

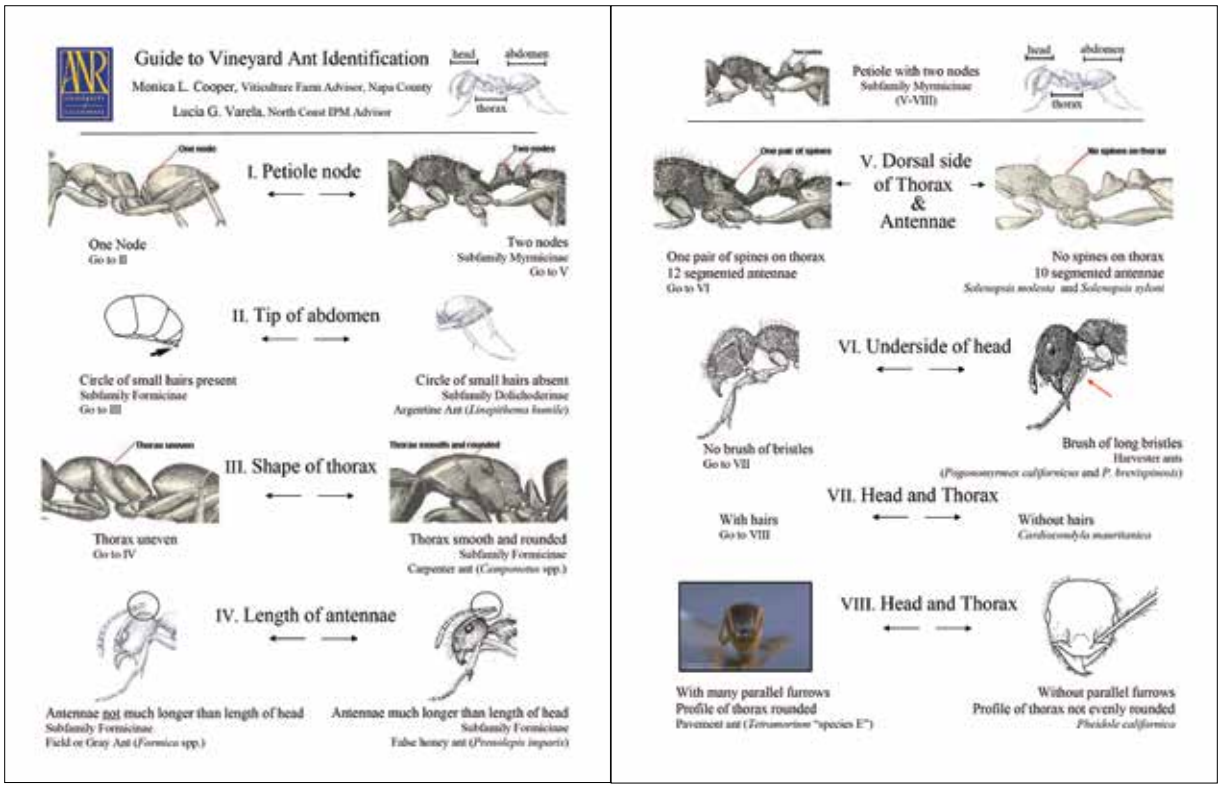
In addition to being a direct pest of crops, the above species of mealybugs along with certain soft scale insects can acquire and transmit grapevine leafroll-associated viruses that cause Pierce's disease in grapevines. Pierce's disease can delay fruit ripening, reduce yields up to 40%, and reduce sugar accumulation in the berries that negatively affects wine quality, increases vineyard costs, and shortens the lifespan of the vineyard.

Biocontrol of mealybug and soft scales in vineyards

Mealybugs and soft scales have a range of predators such as mealybug destroyers and other lady beetles, brown and green lacewings, spiders, minute pirate bugs, predaceous midge larvae, and syrphid fly larvae in addition to parasitoids that help to naturally reduce pest populations below economic levels. Although ants rarely cause direct damage to grapevines, and are often considered to be beneficial as predators, scavengers, and seed dispersers, the presence of certain ant species in the same cropping system as mealybugs and soft scales can prevent naturally occurring biocontrol from being successful.

In the San Joaquin and Coachella valleys, a common ant is the native gray ant (left), which are also referred to as field ants. On the North Coast, Argentine ants are important. Both gray ants and Argentine ants feed primarily on sugars. Credit: Jack Kelly Clark, UC IPM.

Use the *Guide to Vineyard Ant Identification* to identify ants. Identification of ant type is essential to determine what kind of bait (sugar based or protein based) will result in successful management.



Ants disrupt biocontrol

Some species of ants have a mutualistic relationship with mealybugs and soft scale insects resulting in interactions that are advantageous to both species. Mealybugs and soft scales excrete honeydew as a waste product, but honeydew is rich in sugar that ants use as food source. Ants "farm" or "tend" mealybugs by collecting the honeydew produced as a source of nutritional carbohydrates and in return, they protect mealybugs from predators and parasitoids. Ants can be very successful in their protection of honeydew producing insects effectively shutting down naturally occurring and/or released biological control agents.

Control of ants

Tillage of the soil can help disrupt ant colonies and reduce ant populations, but this tactic is not always a feasible or preferred option in an orchard or vineyard setting.

Ants are *eusocial*, meaning that a single ant cannot survive alone but groups of ants cooperate, fulfilling different roles

Many natural enemies play a part in the biological control of mealybugs that naturally reduces pest populations below economic levels. Although ants are not known to cause direct harm to grapevines, the presence of certain ant species in the same cropping system as mealybugs and soft scales can prevent naturally occurring biocontrol from being successful. Credit: Jack Kelly Clark, UC IPM.

Ants collect mealybug honeydew as a source of nutritional carbohydrates and in return they protect mealybugs from predators and parasitoids. Credit: Jack Kelly Clark, UC IPM.

for the wellbeing of the whole colony. The number of worker ants seen above ground are only a small fraction of the ants that make up a colony. Applying a fast-acting pesticide can kill the worker ants above ground but this application will not effectively reach the underground population including the queen ant that produces the offspring that make up the colony. Using a slow acting bait, an attractant combined with an insecticide, for control is a preferred method so worker ants can consume a large amount of bait and live long enough to bring the bait back to the colony to share with fellow workers, larvae, and the queen. Most species of ants have only one queen. A bait that reaches and kills the queen can remove the source of future worker ants and cause the colony to collapse. In species of ants with more than one queen, such as the Argentine ant, bait would need to reach and kill each queen for the colony to collapse, which contributes to the difficulty in controlling this species.

Different species of ants are attracted to different sources of food composed predominantly of proteins, fats, or sugars. In addition, some ants will feed on an alternate type of food when their preferred food source is unavailable. Identifying the species of ant present in a vineyard or orchard that needs to be controlled will help determine their preferred food source. Some baits are sugar based and others are protein based. Accurate species identification is a very important step in choosing a bait that will be most attractive to the foraging ants and therefore the most effective. Online ant keys specific to vineyards, citrus, and household species are available online through the University of California to aid in identification of ant species. ■

References

Cooper M, Varela L. Guide to Vineyard Ant Identification. UC ANR. https://ucanr.edu/sites/SoCo/files/317875.pdf. [Accessed 26 May 2022]

Cooper M, Varela L. Guía para Identificación de Hormigas en el Viñedo. UC ANR. https://ucanr.edu/sites/SoCo/files/317876.pdf. [Accessed 26 May 2022]

Dreistadt S. 2012. Integrated Pest Management for Citrus—3rd Edition. Identification Key to Ant Species. UC ANR Publication 3303. http://ipm.ucanr.edu/PDF/PMG/antkey3303.pdf. [Accessed 26 May 2022]

UC IPM. 2005. Key to Identifying Common Household Ants. UC Statewide Integrated Pest Management Program. http://ipm.ucanr.edu/PDF/TOOLS/antkey.pdf. [Accessed 26 May 2022]

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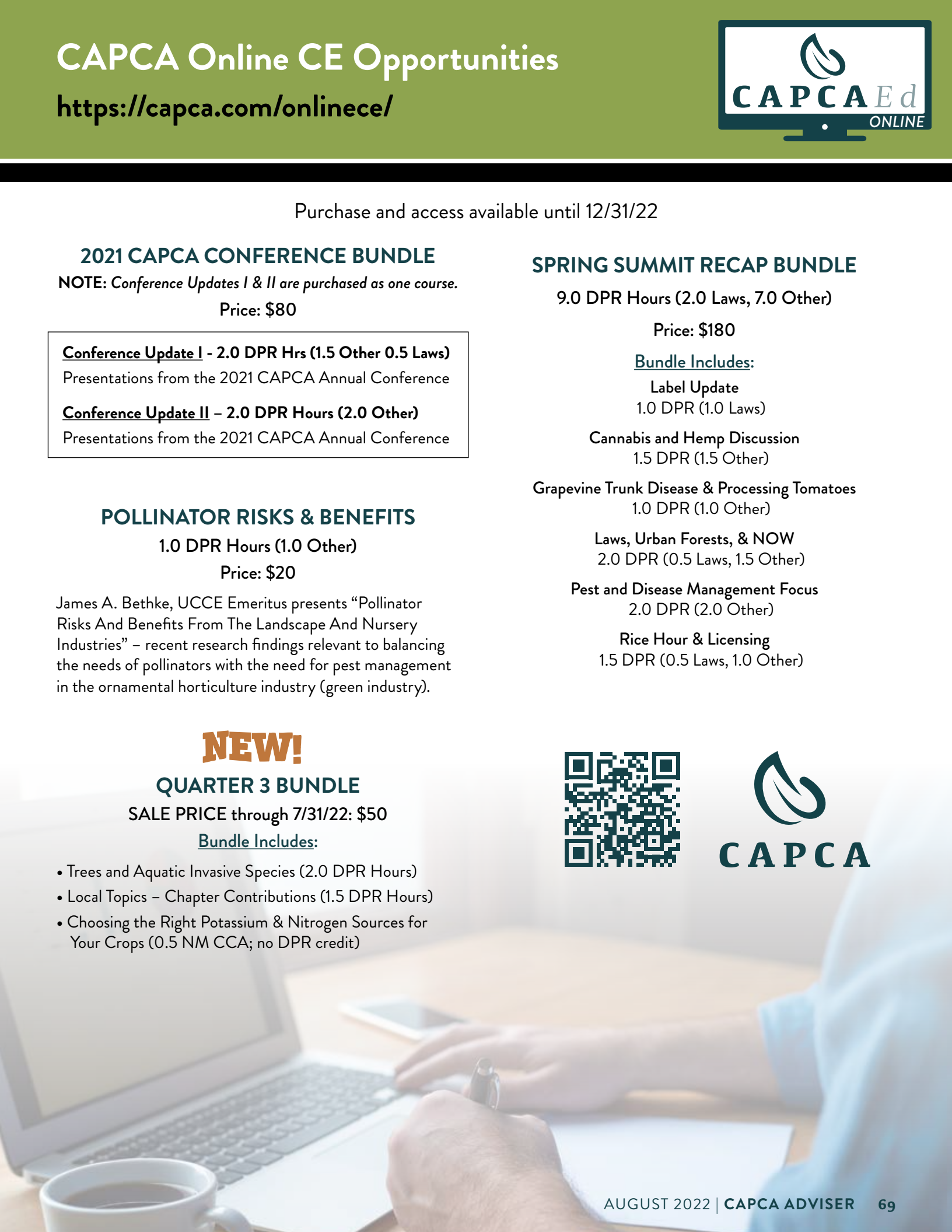

Potatoes and Potassium

Abe Isaak, Agronomist, AgroLiquid

Start early and hit hard up front, because once you get behind, it can be difficult to catch up. That's a lesson learned the hard way, through centuries of farming. Nowhere in ag is this more true than when feeding a potato crop. For example, too much nitrogen late in the growing season, and you end up with some nice-looking potato plants, but we don't get paid for what's on top of the soil. And underneath, yield is often hurt, and quality really drops off. Too little nitrogen and you get small potatoes with poor quality. That means no green on top of the soil and no green in your pocket.

Potassium (K) is critical to maximizing yields and the quality of a potato crop. So much of the end of the season is decided early in a plant's life when reproduction starts. Potassium is responsible for cell division. The more cell division the better the size and quality of the potato crop. Potassium also helps regulate plant stress - specifically heat stress - and it helps move nutrients up and down the plant. It is the second most used nutrient by potatoes after nitrogen.

Soil Test

A soil test must be the foundation of a crop nutrition management plan. Pay close attention to base saturation: if the test reveals the soil is low in K, 3% or less, you may want to add some dry K before planting. If your soil test shows the soil is in great shape, 5% or more, adequate potassium may be able to be applied in season to keep up with demand. However, pulling petiole tests once a week to monitor all nutrient levels is highly recommended.

Petiole Test

When pulling the petiole to be tested, begin at stage III of the potato plant, and take the petiole 4th down from the newest growth. Take a minimum of 30 petioles per sample, with 60 petioles per sample being the preference. If the right amount of K has been supplied to the crop, potassium levels should start to rise over the two weeks between samples. The first sample should come back with 9% K and rise to about 12-14% over the next 2 weeks. In the following graph a liquid potassium product with added sulfur was applied at

planting and in-season applications beginning 4-5 weeks after planting. A total of 18 gal/A was applied. Around day 65 after planting, the potato plant's demand for K increases and it continues to escalate for the next several weeks. The graph demonstrates the plant is using its reserves and is on steady decline, yet high levels are still maintained above 9% until the last 2 weeks when the plant started to desiccate. This process started a little early due to very high temps in central Washington of over 110 degrees.

Know What You Are Working With

It is very important to know soil levels of K before you plant, use the right product at the right rate and the right placement to maximize the benefits of your K fertilizer. With high input costs, higher fuel costs and labor continuing to rise, being able to cover more acres per planter tank load before you have to stop and reload is an important consideration as well. Choose a fertilizer that increases your efficiency. It also keeps your nutrient levels in the plant at desired levels so you can maximize your ROI. ■

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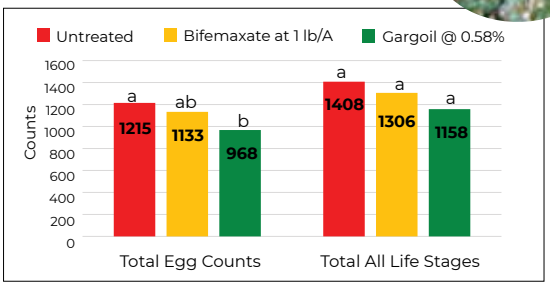

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UC ANR

Description: The Organic Materials Management and Agri-Food System Advisor will implement an innovative extension education and applied research program to address issues related to sustainable organic waste management. The Advisor will improve organic waste management and increase rural and urban agri-food system resiliency through the application and use of recovered organic materials while reducing the impact of climate change through better organic waste management.
Duties, Qualifications & Requirements: A minimum of a Master's degree in agricultural, plant, crop, soil, or environmental science, environmental engineering, or closely related field is required at the time of appointment.
Additional Requirements: Valid driver's license; Expectation to be available to work onsite on any day; Knowledge of organic materials management, recovery, processing, and utilization; Be able to develop and integrate all aspects of horticulture and crop science to promote sustainability, profitability, food safety, and environmental stewardship.
Apply: If interested in this position, please visit: https://recruit.ucanr.edu/ and choose "Applicants" (refer to position #22-02).

Irrigation and Soils Advisor – Stanislaus, San Joaquin & Merced Counties, CA

UC ANR

Description: The Irrigation and Soils Advisor will implement an innovative applied research and extension education program to improve irrigation competence and water use efficiency in orchard and vineyard cropping systems. This position will address high-priority issues around water and sustainable food systems to enhance California's agricultural economy and environment as well as the health and well-being.
Duties, Qualifications & Requirements: A minimum of a Master's degree in water science, soil science, pomology, agronomy, or closely related field is required at the time of appointment.
Additional Requirements: Valid driver license; Expectation to work onsite; Be able to develop and integrate all aspects of crop production to promote sustainability, profitability, food safety, and environmental stewardship; Desired Experience: Passion and desire to pursue a career in Cooperative Extension; Experience in building partnerships and with multidisciplinary teams; Demonstrated ability to effectively manage projects; Knowledge/experience in permanent crops (tree and vines).
Apply: If interested in this position, please visit: https://recruit.ucanr.edu/ and choose "Applicants" (refer to position #22-30).

IPM Entomology Farm Advisor – Salinas, Monterey County, CA

UC ANR

Description: UC ANR is hiring an IPM Entomology Farm Advisor Applied Research and Extension. The IPM Entomology Farm Advisor will implement an innovative extension education and applied research program to address pest management issues facing agriculture. Research and extension will address high-priority issues related to ecologically and economically sound integrated pest management programs.
Duties, Qualifications & Requirements: A master's degree in, entomology, pest management, or a closely related field is required by the appointment date. The Advisor must have a broad understanding of IPM principles, including knowledge of crop production, cultural and biological controls, and pesticide use. It is highly desirable for the Advisor to have knowledge/experience in conducting field research in agriculture; planning and implementation of broad, large-scale research and extension programs. In addition, the passion and desire to pursue a career in Cooperative Extension.
Apply: If interested in this position, please visit: https://recruit.ucanr.edu/ and choose "Applicants" (refer to position #22-29).

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LOOK FOR THE MARK

Current partners of the CE Hours Reported trademark program include:

- Buttonwillow Warehouse
- CA Farm Bureau Federation

WEBINAR TITLE:	DATE:	TIME:	CE HOURS:
Respiratory Protection *(English)*	07/21/2022	9:30 - 10:30 am	1.0 (1.0 Laws & Regs)
Rodent Control *(English)*	09/01/2022	9:30 - 10:30 am	1.0 (0.5 Other, 0.5 Laws & Regs)
Field Fumigants *(English)*	10/13/2022	9:30 - 10:30 am	1.0 (0.5 Other, 0.5 Laws & Regs)
Pesticide Use & Bees *(English)*	11/10/2022	9:30 - 10:30 am	1.0 (1.0 Other)

For registration or additional information, contact Miranda Jachens, mjachens@cfbf.com or (916) 561-5594

- Oro Agri
- UC IPM Webinars

DO YOU HOST DPR CE MEETINGS?

As a sponsor of CE meetings, your company can also take advantage of this promotional tool to assist you in marketing your educational events. CAPCA is offering the use of this trademark *at no cost to those CE sponsors who are dedicated to advancing the professionalism and educational training of all DPR license holders*. Promotion of the meeting includes a basic listing in the Adviser magazine, under CE provider-CE available listings and on our website. (The listing is informational to our members, not ad space for the meeting sponsor.)

For additional information contact Joyce Basan:

joyce@capca.com / (916) 928-1625 ext. 2

Entomology Advisor Applied Research and Extension - Ventura and Los Angeles Counties, CA

UC ANR

Description: The Entomology Advisor will implement an innovative extension education and applied research program focusing on environmentally sustainable arthropod (insect and mite) pest management in agricultural and natural ecosystems in Ventura and Los Angeles Counties. For full description, visit https://ucanr.edu/About/Jobs/?jobnum=217

Duties, Qualifications & Requirements: The position will address arthropod identification and monitoring, pest biology and phenology, crop loss assessment, pesticide resistance monitoring/prevention, application technology, and evaluation of IPM methods with emphasis on biological and cultural controls. It will stimulate adoption of new practices to reduce economic damage from pests while promoting pollinators and beneficial arthropods and minimizing impacts on environment, farmworkers and consumers. A minimum of a Master's degree in entomology, pest management, plant science, agronomy, or related field is required.

Apply: Visit https://recruit.ucanr.edu/ and choose "Applicants" (refer to position #22-18). Closing date: August 5, 2022.

Vegetable Crops Advisor Applied Research and Extension – Woodland, CA

UC ANR

Description: The Vegetable Crops Advisor will implement an innovative and effective extension education and applied research program to address issues related to sustainability, resiliency, innovation, and profitability of vegetable production in the target counties. For full description, visit https://ucanr.edu/About/Jobs/?jobnum=2161

Duties, Qualifications & Requirements: The Advisor will integrate ANR's research and extension education efforts to vegetable growers, pest control advisors and related agricultural industry to improve the competitiveness, profitability, and resilience of vegetable production systems across the region and address issues related to water use efficiency, nutrient management, pest management, organic production, farm sustainability, and whole-farm management. A minimum of a Master's degree in horticulture, plant physiology, crop science, agronomy or related field is required.

Apply: Visit https://recruit.ucanr.edu/ and choose "Applicants" (refer to position #22-41). Closing Date: July 25, 2022.

Sustainable Orchard Systems Advisor Applied Research and Extension - Yuba City, CA

UC ANR

Description: The Sustainable Orchard Systems Advisor will implement an innovative extension education and applied research program to address issues related to sustainability, resiliency, innovation, and profitability of the area's fruit and nut tree crops in the target counties. The major crops of focus include walnuts, cling peaches, and kiwifruit. Visit https://ucanr.edu/About/Jobs/ for more information.

Duties, Qualifications & Requirements: The Advisor will integrate ANR's research and extension education efforts across communities to improve the competitiveness, profitability, and resilience of fruit and nut production systems across the region. This position offers the opportunity to address a myriad of issues related to enhancing management efficiency while reducing the environmental footprint of fertilization, irrigation, and pest management. A minimum of a Master's degree in pomology, production horticulture, plant science, or related field is required at the time of appointment.

Apply: Visit https://recruit.ucanr.edu/ and choose "Applicants" (refer to position #22-37). Closing Date - August 22, 2022.

Territory Sales Manager – California

Marrone Bio Innovations

Description: The Territory Sales Manager (TSM) conducts full cycle sales activities, with key distributors, large growers and market influencer. The TSM spends the majority of their time dedicated to working directly with distributor PCAs, growers and key market influencers including the grower PCAs and CCAs.

Duties, Qualifications & Requirements: B.S degree in Life Sciences or an agricultural-related field; Valid driver's license. Experience: A minimum of 3 years of sales experience with pesticide products or other relevant experience; Bio-pesticide experience is preferred, but not required; PCA or CCA required or acquired within a year of hiring; Candidate must reside in their assigned territory.

Apply: Please apply on our website at https://marronebio.com/about/careers/

Retail Manager – Walnut Grove, CA

Grow West

Description: The Retail Manager is responsible for managing, leading, and directing the Walnut Grove team members. Including, but not limited to, retail strategy and implementation; personnel development; operational oversight; and financial results. Responsible for managing the customer experience across the location service area.
Duties, Qualifications & Requirements: Tasked to manage the overall customer experience and provide customer support for the Grow West Walnut Grove team; Play an active role in the monthly forecasting process and Manager meetings; Responsible for business and personnel strategic planning and execution; Responsible for short-term and five-year business planning for the branch; Support team member recruitment, retainment, and development of employees; Communicate strategy & associated goals to sales, operations, & staff; Identify potential new customers, while creating and executing sales plans.
Apply: Email resume to HR@growwest.com or visit www.growwest.com and click on Careers to learn more about the position.

Sales Representative, Crop Protection - (Remote) California Region

MGK

Description: The Crop Protection Sales Representative will manage and aggressively sell the implementation of MGK's Botanical Crop portfolio sales and marketing strategy at the territory level, working directly with Large Growers, PCAs, Distributors, Retailers, and Strategic Market Influencers with a primary focus in the Organic/Sustainable Crop Protection market.
Duties, Qualifications & Requirements: Create demand for MGK Crop products; Consult/provide customers with technical knowledge and support for Botanical Crop products on key crop/pest complexes; Achieve sales goals and objectives with minimal supervision; Weekly call reports and sales call planning at least two weeks out. Excellent time management and planning skills are required. Bachelor's degree in business or agriculture; 5-10 years of previous outside sales experience required in crop protection. Demonstrated skills at consultative selling, building, and maintaining customer relationships for the long-term.
Apply: Apply online Today! https://www.mgk.com/careers/

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Territory Sales Manager - W. Washington & Oregon

Marrone Bio Innovations

Description: Must be located West of the Cascades. The Territory Sales Manager (TSM) conducts full cycle sales activities, with key distributors, large growers and market influencer. Working closely with the Regional Account Manager, the person is responsible for developing and implementing an agreed upon Territory Business Plan which will meet business goals in the sales and marketing areas.
Duties, Qualifications & Requirements: B.S degree in Life Sciences or an agricultural-related field; Valid driver's license. Experience: A minimum of 3 to 5 years of sales experience with pesticide products or other relevant experience; Crop Protection product experience is preferred, but not required; Candidate must reside in their assigned territory.
Apply: Please apply on our website at https://marronebio.com/about/careers/.

Marketing Communications Lead – Davis, CA

Marrone Bio Innovations

Description: This position offers the opportunity to build off of existing marketing communications skills with a focus on managing business-to-business marketing projects including: educational webinars, technical sales tools, traditional and digital advertising (including social media), tradeshows and more.
Duties, Qualifications & Requirements: Minimum bachelor's degree, preferably in marketing, creative design or closely related field; Valid Driver's License. Experience: Minimum 5 years of professional marketing communications experience, preferably with at least 2 years of experience in the agricultural field. 1. Educational & Technical Tools - 30%. 2. Social Media - 20%. 3. Advertising (Traditional and Digital) - 20%. 4. Tradeshows - 20%. 5. Other - 10%.
Apply: Please apply on our website at https://marronebio.com/about/careers/.

Attorney – Remote

Marrone Bio Innovations

Description: Exciting opportunity to join Marrone Bio Innovation's international legal department. We are seeking an in-house counsel who is eager to tackle a wide range of legal areas, including capital markets, mergers and acquisitions, intellectual property, contracts, and compliance. This is an excellent opportunity for a young attorney to quickly gain substantive experience in a cross-border environment.
Duties, Qualifications & Responsibilities: J.D. law degree; licensed (or about to become licensed in 2022) to practice law in the United States; Valid driver's license; Valid passport. Experience: Recent graduates will be considered; 1–3 years of legal experience a plus; Spanish language proficiency not required, but a plus.
Apply: Please apply on our website at https://marronebio.com/about/careers/ ■

CAPCA
CENTRAL VALLEY

Central Valley CAPCA Chapter

46th Annual Bug Stompers Golf Tournament

Friday, August 5, 2022
Manteca Park Golf Course
305 N Union Rd
Manteca, CA 95337

Check-in: 7:00 a.m.
Tee Time: 8:00 a.m.

Registration deadline 08/01/2022

Registration and additional information at: https://capca.com/chapters/central-valley/ or contact Jennifer DeJong at (209) 968-6384

Get Involved With Your Local Chapter Today!

CAPCA Chapters are currently participating in a Chapter Ranking program to build a little friendly competition and reflect value for all the volunteer lead activities happening at your local chapter. CAPCA Chapters are doing a lot in their community and for their profession.

We encourage all CAPCA PCA members interested in serving on their Chapter Board or participating in local Chapter events/activities to contact their local leadership members: https://capca.com/chapters/

Get involved today!

Desert Valleys Chapter 2022 Continuing Education Meetings

Wednesday, August 10, 2022
12:00 p.m. - 4:30 p.m.
Imperial Irrigation District Office,
81600 Avenue 58, La Quinta, CA
Luncheon & Meetings start at 12:00 p.m.

Desert Valleys Chapter Annual Member Appreciation Lunch

Thursday, November 3, 2022
12:00 p.m. - 4:30 p.m.
Farm Credit West Conference Room,
485 Business Parkway, Imperial, CA
Luncheon & Meetings start at 12:00 p.m.

Luncheon provided at all meetings
CAPCA Members/IID Employees = No Charge
All Others = $25

(Meeting dates & times are subject to change)
Contact Desert Valleys Chapter for more information
https://capca.com/chapters/desert-valleys/

Desert Valleys Chapter Scholarship Awards

Each year, Desert Valleys Chapter awards two scholarships to deserving students who reside in the desert areas of Southern California and/or Western Arizona. The Desert Valleys Chapter includes members from Coachella, Imperial, Bard and Blythe Valleys of California, as well as the Yuma, Gila, Dome, Wellton-Mohawk and Parker Valleys of Arizona.

One $2,000 scholarship is specifically for a graduating senior high school student with an interest in agriculture, including agronomy, entomology, soils, or related fields with the objective of a career in pest management, agronomy, plant breeding or farming. Another $2,000 scholarship is specifically for a college student who has an interest in agriculture, including agronomy, entomology, soils, or related fields with the objective of a career in pest management, agronomy, plant breeding or farming.

A third scholarship opportunity is the Bob Chan Memorial Scholarship. This scholarship is awarded annually to a deserving college student from the Imperial Valley, specifically for someone who has an interest in agriculture, including agronomy, entomology, soils, or related fields with the objective of a career in pest management, agronomy, plant breeding or farming.

2022 Desert Valleys Scholarship Winners:

CAPCA college student in the amount of $2,000 is **Jesus Andrade**

CAPCA high school student in the amount of $2,000 is **Alexandra Veysey**

CAPCA Bob Chan Memorial in the amount of $1,000 is **Donald Benedict**

Congratulations to this year's recipients!

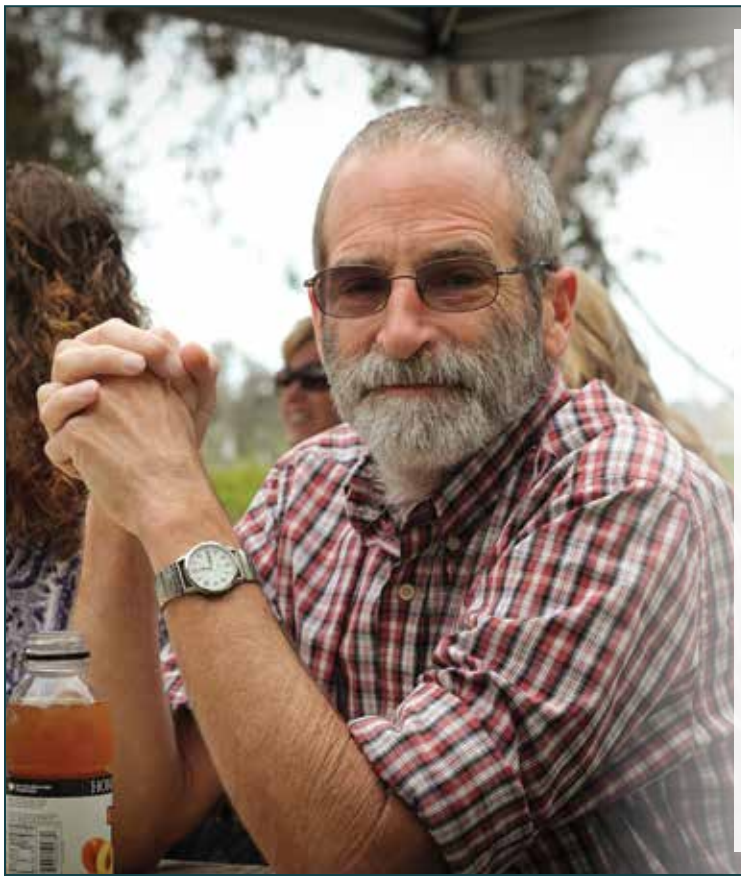
Fresno-Madera Chapter CE Meeting

Thursday, September 22, 2022
Wedgewood, 4584 W Jacquelyn Ave, Fresno, CA 93722
8:00 am - 3:00pm

Pre-Registration: $75 (closes Tuesday, September 13th)
Onsite Registration (space permitting): $85

Lunch included: Guaranteed for pre-registered attendees only

For registration or additional information visit https://capca.com/events/ or contact Adam Tavarez: AdamT@Amvac.com



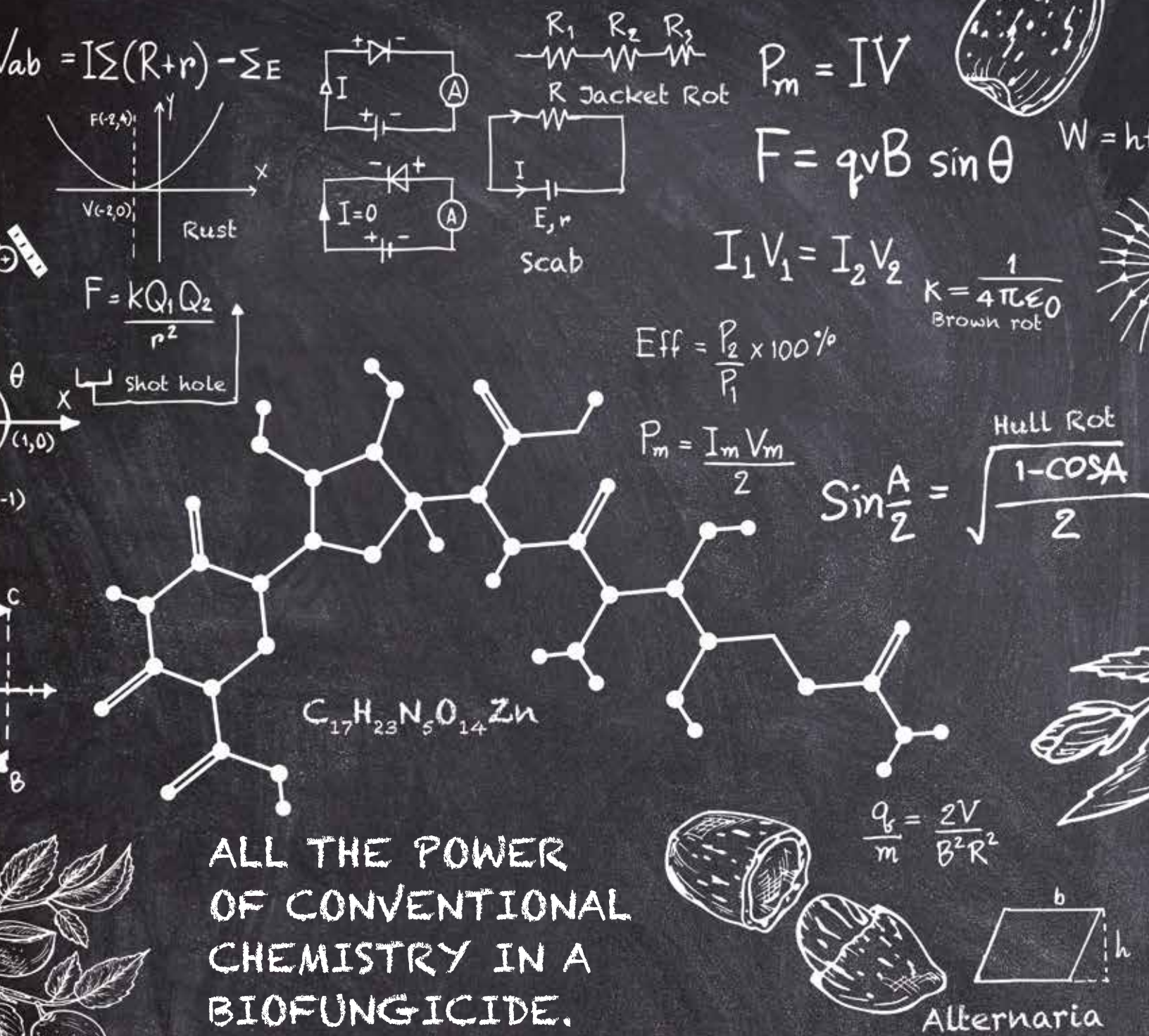
In Memorium

Andy Hudson, Ph.D.

It is with great sadness that we announce the loss of our beloved colleague and friend, Dr. Andy Hudson, who passed away recently. Andy was a highly valued member of the SAN Agrow (formerly Westbridge) team and a long-time CAPCA member. As Director of Quality Control and Senior Research Scientist since 2012, Andy's vision and leadership were an integral part of SAN Agrow's research and product development endeavors.

Andy left his mark on all of us who knew him. He taught us so much about everything - from plant development to photography to the current state of the Cleveland Browns football team. Andy had extraordinary passion and a quick wit. He could always be counted on to make dry, technical information interesting and easy to understand.

We are eternally grateful that Andy came into our lives and enriched our days with his immense knowledge, integrity, and kindness. His expertise and sense of humor will be greatly missed!



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