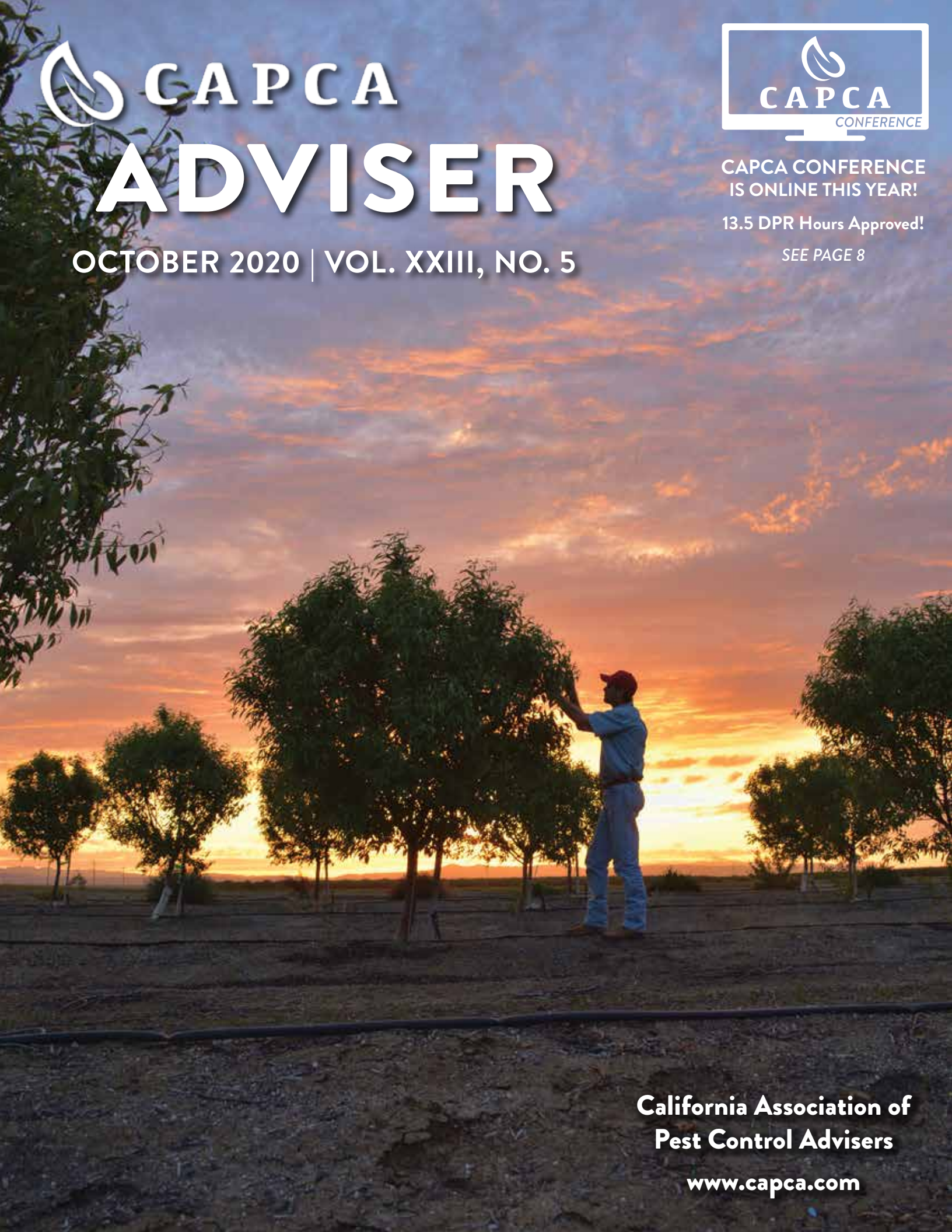

CAPCA ADVISER

OCTOBER 2020 | VOL. XXIII, NO. 5

CAPCA CONFERENCE

CAPCA CONFERENCE IS ONLINE THIS YEAR!

13.5 DPR Hours Approved!

SEE PAGE 8

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AT THE CENTER OF PLANT HEALTH

Table of Contents

CAPCA PHOTO CONTEST

See page 16

DEPARTMENTS

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From the Editor

Changing Times

These past few weeks I have found myself encountering calendar events and deadlines, inputted before the pandemic for the CAPCA Annual Conference in Anaheim, which are now obsolete. This event has been planned and re-planned so many times and culminated in the virtual Conference launching October 12th. This Conference season has taken a very different shape for me and CAPCA staff as we prepare elements and invite registered attendees to consume the on-demand CE program from October 12 – 31st, instead of three packed days of events, meals and interactions. We are grateful for the 21 sponsors and 60 exhibitors that have taken a chance on an untested virtual event, supported the CE program development, and will provide interactive virtual space for attendees.

This year will not be soon forgotten as it marks a clear shift in not only our world, but in the things we value, the people that we hold dear, and the ways that we prioritize our time. Beyond shifting to a virtual Conference, in the past six months I have seen a resilient CAPCA staff find new pathways to support our membership in an emerging virtual space, bringing professional education to PCAs in the comfort of their home/office. While we hope to be in person again soon, I want you to continue to feel the support of the CAPCA team as we change with the times to continue serving CAPCA members from a social distance.

Ruthann Anderson, Editor
ruthann@capca.com

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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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Agriculture, Agri-Culture, Ag as Culture

Rick Harrison, CAPCA Chair

If you look up the word agriculture online there are countless definitions for this very comprehensive word. Most definitions say the word agriculture derives from Latin ager (field) and colo (cultivate), signifying when combined, the Latin agricultura: field or land tillage. In the broadest sense it could mean the science and art of cultivating plants and livestock and could include fiber, horticulture, forestry and animal husbandry. But what about the actual culture of agri-culture? What is culture in the PCA's experience?

Before I was a PCA, my goals for a career in agriculture were only fully realized as a result of an astute team of instructors and experts in the Cal Poly Pomona agriculture department. They, like most Ag College professors whom I have heard praised over the years, were invested in the students, offered an immense amount of encouragement and direction to the students, and made agriculture in all its aspects very interesting. And, they told me I would have a job in Agriculture the minute I graduated, and that's why I chose a degree in Ag Bio. They kept their promise. This was my first experience with the culture of Agriculture.

I didn't know it at the time but after 20 years of working within the culture of agriculture, I feel blessed to have a family of likeminded fellow PCAs who are more like family than fellow industry professionals or rivals! I have found that our sharing of ideas, knowledge, approaches, recommendations, and camaraderie is what has gained us respect within our culture. Therefore, CAPCA's Annual Conference, Spring Summit, and local CE Outreach is so vital. While continually supporting the PCA through providing required CE hours, we are also providing that vital agri-culture we have come to rely upon. The networking, sharing of ideas, learning about new products from vendors, or learning more about a product you already know of is the input and feedback necessary to sustain our agri-culture at conference. These are key elements in CAPCA's investment in our future as PCAs and a continuation of our agri-culture.

Unfortunately, as you already know, we will not be gathering for our Annual Conference as a result of Covid-19 restrictions here in California. So, I hope our Virtual Conference provides you with interesting and inspiring CE just as we have always provided. While we may not be able to walk the exhibit hall floor to catch up on the newest products and technology, our exhibitors have created interesting online spaces to connect, learn, and maybe even have the opportunity for a giveaway or two. CAPCA, PCAs, and agriculture are resilient and the dedication to continuing the professionalism we all experience at Conference is just one of many examples of this.

Remember to encourage and praise your fellow PCAs for their dedication and participation in our Agri-Culture. ■

Advertorial

POTASSIUM NITRATE:

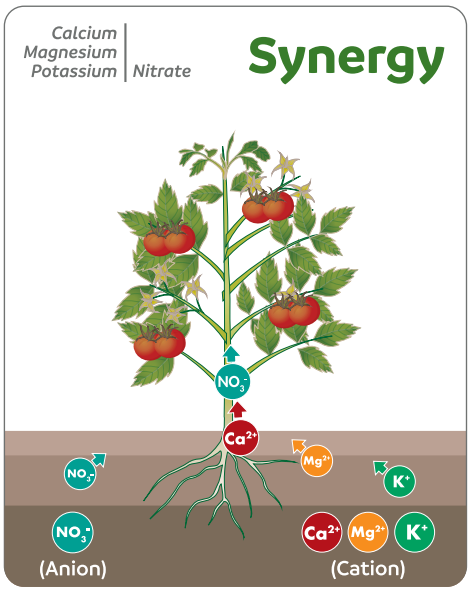
KEY ALLY FOR SUSTAINABLE AGRICULTURE BUSINESS

Content provided by SQM North America

The farmers' need for producing more food and using less land in controlled environments is transforming agriculture and making inhouse cultivation a fast-growing activity. In this increasingly challenging situation, incorporating the right fertilizer in the right amount becomes even more important. Whether it is wheat, almond or tomato, potassium nitrate is without a doubt the preferred potassium and nitrogen source for growth and balanced nutrition under any conditions.

Numerous studies show that nitrate in potassium nitrate enables the plant to minimize chloride uptake whenever it is present in the soil solution or the irrigation water. Similarly, the potassium in KNO_3 counteracts the harmful effects of sodium. Therefore, potassium nitrate is highly recommended for salt-sensitive crops or when irrigation is being done with poor quality water.

Nitrate is non-volatile and enhances the uptake of potassium (K^+) together with other essential cations like calcium (Ca^{++}) and magnesium (Mg^{++}).



The use of potassium nitrate is indispensable to increase the nitrate (NO_3^-)/ammonium (NH_4^+) ratio, which positively affects plant performance during all growth stages.

Less water, better yields.

Being responsible for opening and closing the stomata, potassium minimizes plant transpiration and reduces its water requirements. Adequate potassium nutrition in the plant enhances its water sourcing efficiency. Additionally, KNO_3 prevents salinity build-up and eliminates the need for additional irrigation to remove salts from the soil.

Research shows that potassium nitrate (KNO_3) results in a higher value product and more return on investment for the grower.

Trials also show that nitrate-fed plants utilize water more efficiently than ammonium-fed plants. This difference becomes even more significant when potassium concentration in the soil solution is low.

The nitrate in KNO_3 increases the pH of the root surface. Uptake of nitrate by the roots causes a release of hydroxyl anions (OH-), creating a slightly alkaline environment in the root zone, which improves acidic soil properties. Additionally, nitrate in potassium nitrate enhances the formation of organic acids (carboxylates), which facilitates the release of phosphate and micronutrients from soil particles to the soil solution.

KNO_3 is compatible with other fertilizers and allows multiple application methods. Unlike ammonium, the nitrate in potassium nitrate is non-volatile, so there is no need to work it into the soil when it is applied by top dressing or side dressing.

Crop resistance.

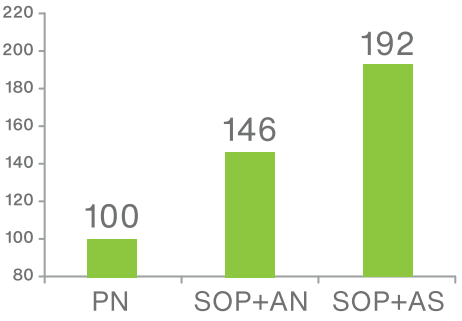
More than 2,400 studies have confirmed that the right levels of nitrogen and potassium improve crop resistance. Adequate additions of a good quality potassium source, such as KNO_3, result in the reduction of bacterial infections up to 70%; fungal infections 63%; insects and mites 60%; viruses 41%; and nematodes 33%.

Potassium in potassium nitrate has a positive impact on parameters such as fruit size and appearance, nutritional value, flavor and aroma, shelf life and the processing quality for industry. An adequate supply of potassium helps to obtain both high yields and quality, resulting in a higher value product and more return on investment.

With KNO_3 up to 92% lower contribution to soil salinity than K_2SO_4 + N source

EC = electrical conductivity

Relative EC (%) at Equal N and K Nutrient Input



AN= ammonium nitrate
AS= ammonium sulphate

sqmnutrition.com

2020 ONLINE CONFERENCE

Register online at: www.capca.com/conference

Registration: $200 per attendee.
Content will be available on-demand to all registered attendees, October 12th–31st, 2020.

Continuing Education for CAPCA's 2020 Online Conference

This year all Continuing Education will be offered on-demand to registered attendees through CAPCA's online CE platform, CAPCACE.com from October 12th through October 31st. All CE sessions will be broken into segments so attendees can watch on-demand the sessions they are most interested in and acquire only the hours they need.

Courses will be offered in one- and two-hour blocks with the same sessions that you are familiar with:

- Label Updates
- General Sessions
- Breakouts
- CDFA FREP Nitrogen Management Update

13.5 DPR Hours approved (7.0 Laws, 6.5 Other)
17.5 CCA Hours have been approved.
13 AZ Hours have been approved.
ISA Hours pending.

Thank you to all speakers, label update presenters, sponsors and exhibiting companies who have rallied to provide their support to help bring this online event to fruition! Your effort to support the professionalism of PCAs and access to quality education during the pandemic does not go unnoticed!

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2020 CAPCA ONLINE CONFERENCE PROGRAM OUTLINE

Join us for these educational and informative presentations!

General Session

Nematodes and Management of Trunk Diseases:

- **Prescribing New Technology for Nematodes** – Jeff Baxter, Bayer Crop Science & Chuck Bates, Netafim
- **Management of Trunk Diseases in Permanent Crops** – Issa Quandah, FMC

Industrial Hemp and Cannabis Update:

- **Industrial Hemp: What You Should Know as a PCA** – Rick Gurrola, Shasta County Agricultural Commissioner's Office
- **Cannabis Regulatory Update** – Juan Hidalgo, Santa Cruz County Agricultural Commissioner

Weed Control:

- **Discussing the Transition of Pest Management** – Bryan Thompson, Pest Options
- **Alternatives to Glyphosate: Efficacy and Trade-offs in the Landscape** – Karey Windbiel-Rojas, UCANR

BeeWhere, Bees and Endangered Species:

- **BeeWhere Update** – Ruben Arroyo, Riverside Agricultural Commissioner
- **Update on Native Pollinators** – Josette Lewis, Almond Board of California
- **National Pesticide Registration, Local Pesticide Use and Endangered Species: A Complex Set of Challenges** – Bernalyn McGaughey, FIFRA Endangered Species Task Force

State and Local Regulatory Update:

- **CACASA Update** – Joshua Huntsinger, Placer County Agricultural Commissioner
- **DPR Update** – Val Dolcini, Director Department of Pesticide Regulation

PCA 101:

- **When in Doubt, Scout** – John Palumbo, University of Arizona
- **Pesticide Drift Liability Issues for PCAs: Mitigation and Best Practices** – David M Leath, Petrie Leath Larrivee & O'Rourke, LLP

Breakout Sessions

Biostimulants – Patrick Brown, UC Davis

Salinities Issues in Avocado and Citrus – Peggy Mauk, UC Riverside

Urban Invasive Species –

- **Invasive Shot-hole Borer Detection and Management** – Ed Williams, Ventura County Agricultural Commissoner
- **Southern California Urban Invasives** – Igor Lacan, UCANR

CDFA FREP Nitrogen Management Update

- **CDFA Healthy Soils Program** – *Geetika Joshi, CDFA*
- **Nitrogen Cycle in Orchards and Efficient Nitrogen Management** – *Saiful Muhammad, QualiTech*
- **Soil Fertility Management for Organic Cool Season Vegetable Production** – *Richard Smith, UCANR*
- **Integrating Research to Address Environmental Quality Using Almond as a Case Study** – *Sat Darshan S. Khalsa, UC Davis*

Label Updates

The following companies will be providing label updates:

AgBiome
Agrian Inc.
Amvac
BASF
Bayer Crop Science
BioSafe Sysytems
Brandt
Certis
Corteva
FMC
Gowan USA
Helena Agri-Enterprises LLC
Kemin Crop Technologies
Miller Chemical and Fertilizer, LLC
Nichino America Inc
Ocean Organics Corp.
Pacific Biocontrol Corp
QualiTech
Redox
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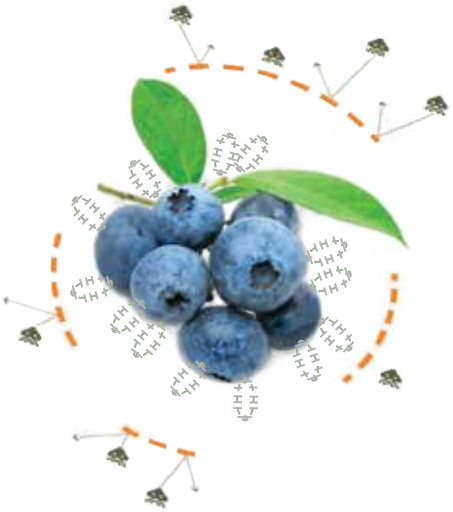

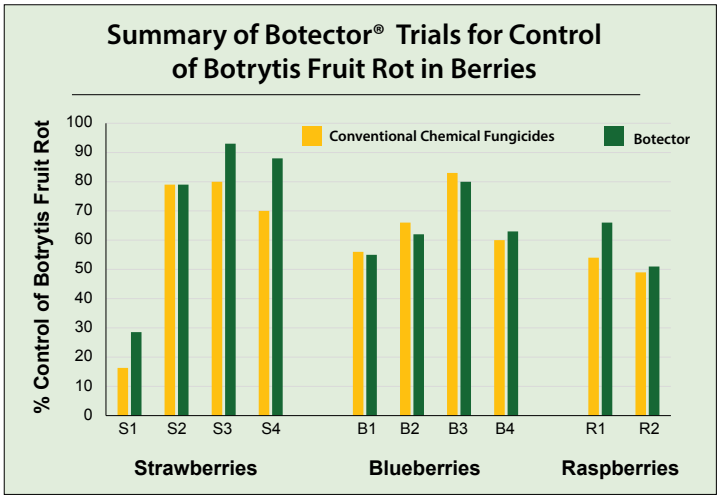

Botector® prevents botrytis in grapes, berries and tomatoes, anthracnose, phomopsis and rhizopus rots in berries, blossom blight and brown rot in stone fruit and almonds, and post-harvest rots in pome fruit.

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BioFlora (Global Organics)
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Central Life Sciences
Certis USA LLC
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DTN
Duarte Nursery Inc.
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Grow West
Huma Gro
ICL Specialty Fertilizers
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Nutrien Ag Solutions
Nutrient Technologies
Ocean Organics Corp.
Patagonia Bio
Polymer Ag, LLC
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QualiTech, Inc.
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Rotam
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CAPCA 2020 CONFERENCE

OCTOBER 12-31

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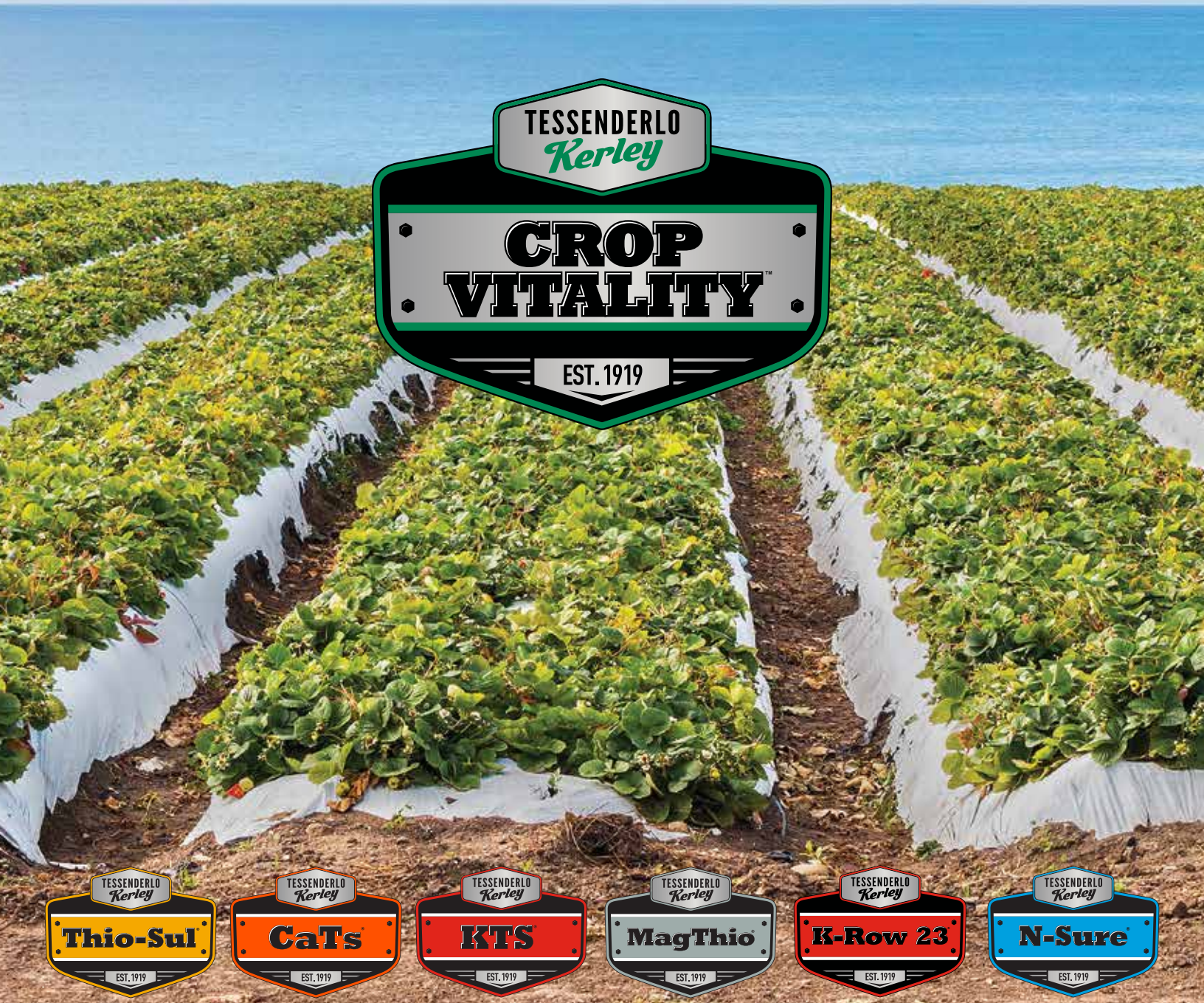
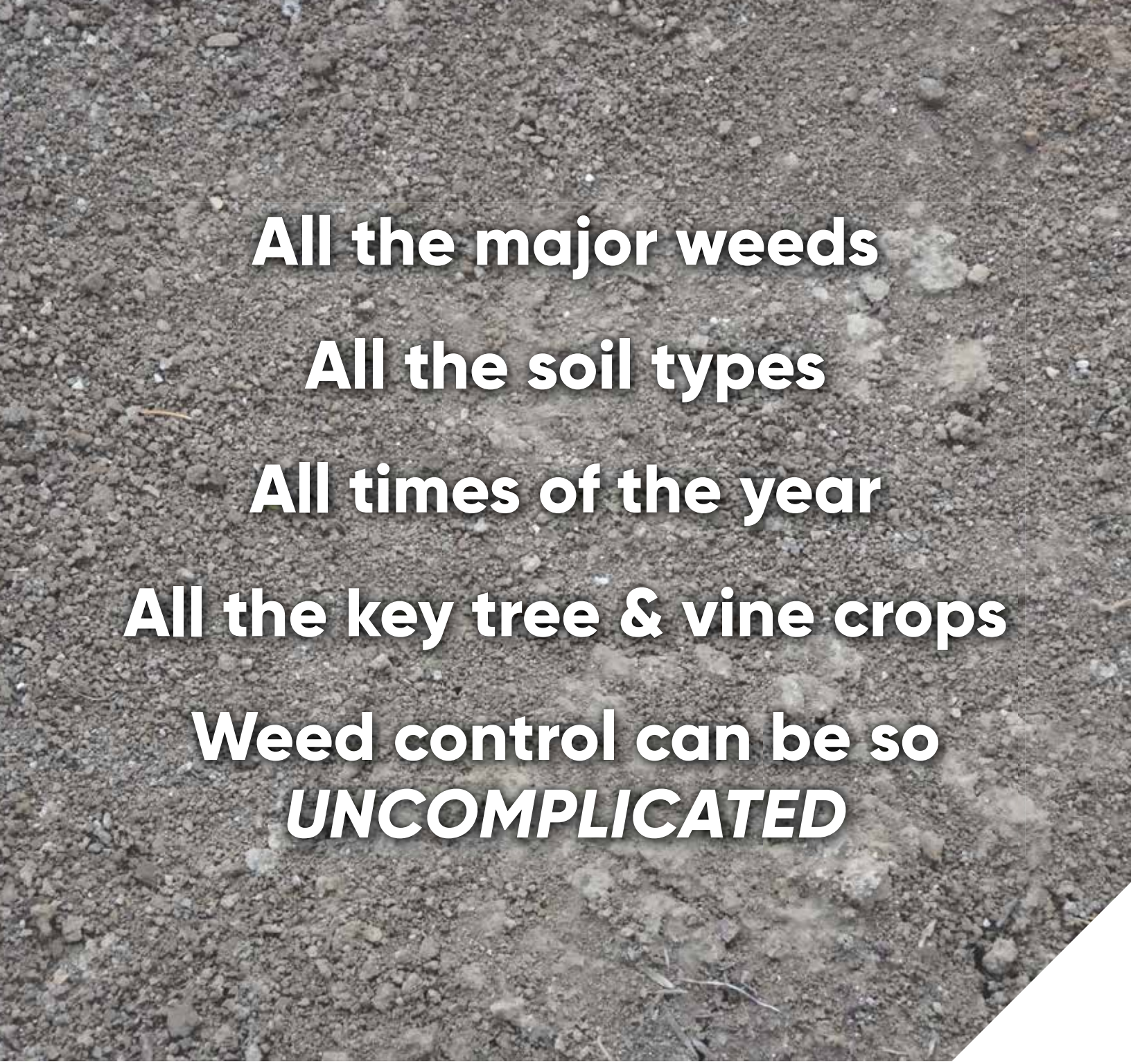


SPONSORS

Thank you to our 2020 Conference Sponsors for supporting the development of our new online conference.



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Submissions due October 26th

2020 CAPCA Photo Contest

https://capca.com/photo-contest/

ELIGIBILITY:

- The 2020 CAPCA Photo Contest is open to any amateur photographer (one who does not regularly receive income from photography) who is a current 2020 CAPCA Member.
- Entrants must be eighteen (18) years or older to participate.
- Photo subject matter must be related to California Agriculture/Horticulture Industry operations.

IMPORTANT DATES:

Submission Deadline – extended to October 26, 2020.

Winner Announcements will be made at the close of the CAPCA Online Conference, October 31, 2020.

Winning Photos Posting – Winning photos will be published in the December 2020 CAPCA Adviser magazine, on the CAPCA website and through CAPCA Social Media platforms.

JUDGING:

Judging will be held by committee/panel review. Winners will be contacted by e-mail.

CATEGORIES:

There are five (5) categories in the contest. Each entrant is eligible to win only one (1) prize.

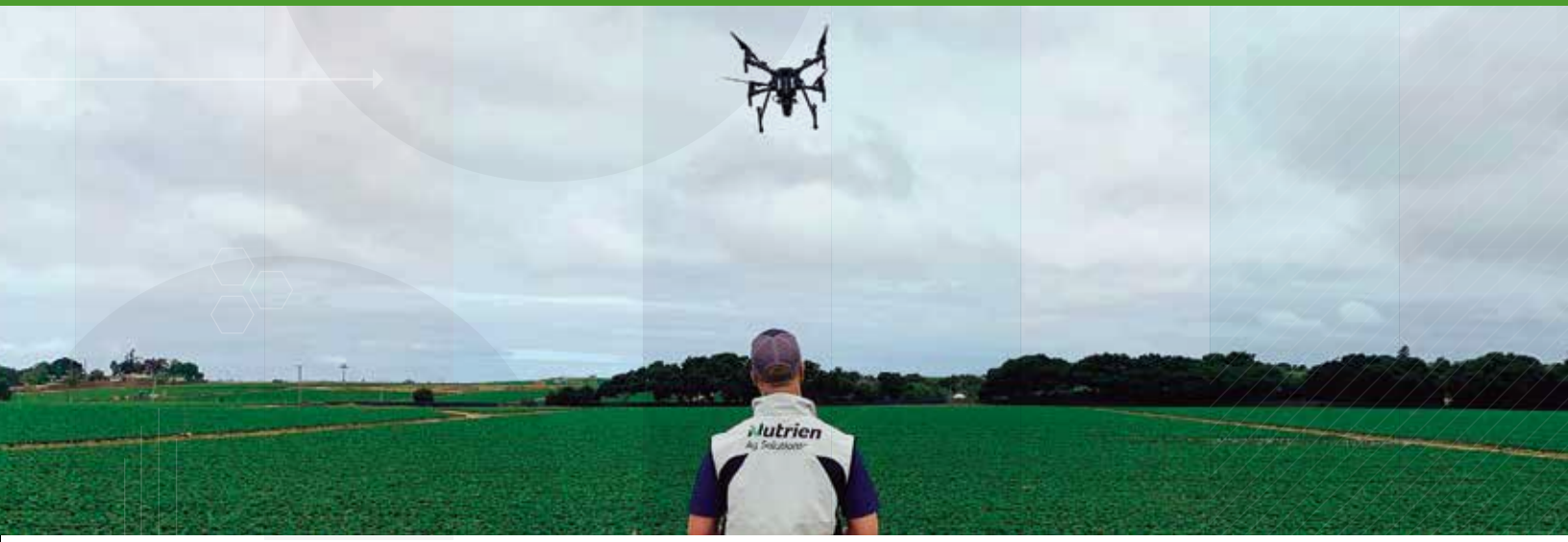
One (1) winning photo from each of the following five (5) categories will be selected.

1. Crop/Commodity Production
2. People/Faces in Agriculture
3. Integrated Pest Management (IPM)
4. COVID-19/Quarantine Impacts to California Agriculture/Horticulture Industry Operations
5. Good Bugs/Bad Bugs

PRIZES:

From the five (5) photos selected the winners will be chosen for one of the following prizes.

- One Grand Prize winner $1,000
- One First Place winner $500
- Three Honorable Mentions $250 each



Eye in the Sky: Drones Help Growers See What They Can't

By Nutrien Ag Solutions, with Dylon McClure

It's not often satellite technology takes a back seat to something as simple as a drone, but Dylon McClure managed to make it happen.

McClure is a Drone and Analytics Specialist at Nutrien Ag Solutions™, the world's largest supplier of crop inputs, services and solutions. Frustrated with the cost and inefficiency of using satellite imagery to analyze strawberry fields, he took to drones.

Cameras on Steroids

SlantRange, a company specializing in developing aerial crop sensors, set McClure up with what he describes as "a camera on steroids," capturing imagery at extremely high resolution and light outside the visible spectrum.

The drone identifies individual strawberry plants and also shows the health of each plant. The key, says McClure, is in analyzing each plant's light signature. "I could tell the grower how many plants had died off, and exactly how many more he needed to go and buy," he says.

Spotting Two-Spotted Mites

In one instance, the mapping technology spotted a high degree of plant stress in a concentrated region of the strawberry field McClure was studying. The stress, it turned out, was due to two-spotted spider mites that had been hiding under the leaves.

Even though the plants weren't showing visible signs of stress, the drone's sensor detected the mites' impact on the plants' chlorophyll indexes. As the mites remove sap from the chlorophyll under the leaves, the sensor can detect the slight alteration of chlorophyll pigments, targeting where the mites are.

Ultimately, the technology is already there. McClure and his combination of drones, sensors and analytics software help growers more effectively and efficiently manage their crops every day.

Time is Money

McClure and his team can show drone analysis results to growers minutes after a drone flight is complete. Additionally, the data collected by drones goes beyond showing existing problems; it determines which portions of a field are likely to develop issues in the coming weeks or months.

Ultimately, what it all means for growers is the technology to more effectively and efficiently manage crops is already here. The combination of drones, cameras and analytics software helps growers maximize their yield on every field.

For more information, visit
www.precisionagrilab.com.

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8630_07/2020

History ignored is history repeated

George Soares, Kahn, Soares & Conway, LLC

The 2020 COVID pandemic will eventually make its way into history books, just as the 1918-20 Spanish Flu pandemic did 100 years ago. It's another matter as to how many will read and benefit from these books in the future.

It's evident now that had more of us brought history forward to 2020, we would have been better educated on the front end about masks, crowded living, precautionary isolation and more. Instead, we are paying the price of relearning history because we allowed the Spanish Flu to become the "forgotten pandemic."

Our historical shortcomings with pandemics is analogous to the inherent, ongoing meandering of state government from one imagined original idea to another. While this sort of happening occurs in our daily lives often with unknown consequences at the time, it's another matter when public officials (elected and appointed) venture into the unknown without thoughtful and historic analysis. Too often such action fixes what is not broken and puts us on the merry-go-round of repeating history.

California production agriculture and related businesses have historically relied on science and education as fundamental ingredients in producing food and fiber and have become the best in the world at making it happen. The science associated with researching and developing essential crop protection tools, and the demanding educational requirements to become licensed pest control advisers are two prime examples.

Increasingly, however, these underpinnings are becoming a distant memory, if a memory at all. It's being replaced by noise that argues everything but science and education but is loud enough to get political support for banning crop protection tools needed for the quality life we all enjoy. This is not hypothetical. Earlier this year, state government banned one product important to growers of several commodities with a promise of alternatives but instead, government formed a committee and provided dollars for research. Not exactly balanced; certainly not common sense, and absolutely threatening to the people who make their living growing and harvesting these crops.

As if once is not enough, there are clear signs that government is on the pathway to do it again with a class of chemicals commonly referred to as neonics in order to further protect pollinators. The problem here is not the purpose—industry more than most including government understands the importance of bees and their role in the production of numerous crops—it is the proposed overreach that will allow continued use of neonics but at levels ineffective at controlling pests; in effect a taking of the products without any effective alternatives in sight.

To CAPCA's credit, it found a much more practical way to protect bees and it didn't come with regulating chemicals out of existence. Working with county agricultural commissioners, CAPCA developed the BeeWhere program which played a key role in updating reporting tools to current century technology, thereby equipping stakeholders with communication avenues that connect beekeepers, commissioners, pest control advisers, farmers and applicators with hive locations. Both bees and crops are protected which is the obvious goal rather than picking winners and losers.

CAPCA has also worked with the state and stakeholders to develop best management practices for bees, managed pollinator protection plans and bee protection areas but it never seems to be enough and never will be until government recalls all that has preceded this

moment in time.

I recently talked to a very experienced pest control adviser about this dilemma of excessive regulation and asked whether he had the tools needed to protect crops grown by his farmer clients. He responded "Yes, in some cases, but the list of options is dwindling and I'm running out of ideas for some crops." He added: "I don't understand! We are licensed by the state, we work closely with county agricultural commissioners, the products we need are approved by the Federal EPA and used throughout the country but disappearing in California. Government is undercutting laws we have lived by and now I have no idea where we are headed."

Quite a transition from a time when producing food and fiber was a favored occupation in California. Unfortunately, that history is not known by many today except possibly as it relates to COVID where the public has a new but probably temporary appreciation for agriculture.

Assuming government continues its ongoing search for "extra layers of protection" under the guise of public health concerns, it will be up to industry to rescue itself and thereby write a new chapter in its own history book. CAPCA is well positioned to be a leader in this effort and has already taken steps to bring reality back into play with state government officials through the advocacy of its nearly 3,000 PCA members. They are the ones located throughout urban and rural areas of California, armed with subject matter expertise, who interact with farmers and homeowners alike, are in frequent contact with county agricultural commissioners, balance needed to protect crops while selectively using crop protection tools.

With these credentials, PCAs can and are making constructive "noise" by insisting that government remember and adhere to a well reasoned statutory framework adopted decades ago and allow California agriculture to function as intended. ■




PCA Profile: Desert Valleys Chapter President, Preston Hutchinson

By CAPCA Staff

Preston Hutchinson graduated from New Mexico State University in Las Cruces, New Mexico with a Bachelor's degree in Ag Business & Economics and a minor in Marketing & Business Administration. He obtained his PCA license in 2017 and also holds a QAL. Some of the major crops he consults in throughout Imperial County are romaine, head lettuce, spinach, kale, arugula, sugarbeets, alfalfa, and bermudagrass.

Currently, Preston works for Helena Agri-Enterprises, LLC, out of Brawley, California. "I started out as a summer intern in 2014 and worked my way up to a salesman by the fall of 2017 and have not looked back yet," he says. "We wear a lot of different hats, not only are we salesmen, we are also well educated in soil, water, fertilizer, and chemicals. With this job I pull tissue and soil samples, sell fertilizer to growers and also write recommendations on all types of crops." Looking back, he says he knew he wanted to be a PCA toward the end of his summer internship: "I knew this would be a great fit for me because of the niche job that it is. Being a PCA put me front and center in the world of food and agriculture as well as put me in the great outdoors where I love to be."

He also credits his time working for a research and development company out of Washington State as integral to where he is in his career now: "It was a point in my career that provided great insight into what it takes to get a chemical to the marketplace. The brief time I spent working there helped shape my career to what it is today. Seeing how products work in all sorts of environments helped guide me to become a better PCA in the field."

His roots in agriculture include summers hauling hay for his grandparents' custom road siding business and a summer internship in Yakima, Washington working on research for cherries, apples, hops, and pears.

Preston is a dedicated to the future of ag and is very engaged in the work he gets to do. One of the areas he specializes in is using the Albrecht Model being taught by Dr. Neal Kinsey: "It is a specific soil test to determine nutrient needs and then recommending the appropriate types and amounts of fertilizers and soil amendments to fill those needs. The balance of soil nutrients is something that is unique and can be used all across the world. I use it specifically here in Imperial County to balance our soils and have had great success implementing this program for my growers."

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[1]*Source: BRANDT Field Trials 2016-2018*

Asked how he describes his job to those outside the industry, Preston says: "I would describe being a PCA as being a soil and plant health doctor who helps maintain and promote sustainable agriculture. I write prescriptions (Recommendations) for farmers and growers to help advise them on the necessary steps it takes to maintain balanced soil as well as following a safe integrated pest management program." One of the highlights of his career has been the opportunity to speak at the Aviation Continuing Education Seminar presenting on Helena Adjuvants that help with spray water quality and spray efficacy.

Sharing why he became a CAPCA member, Preston says: "I wanted to be part of an organization that I knew would fight for my job each and every day. I believe CAPCA gives us the tools for education, stewardship, and legislative information to be a well-informed PCA." Preston is active in his local Desert Valleys Chapter, having served in 2019 as Treasurer and now as President. "I volunteered for this role because I believe in giving back to an organization that is willing to help fight for my job and give me the necessary tools to help me succeed." His role in CAPCA leadership enables him to represent the PCA license, and to promote the best Integrated Pest Management and stewardship practices.

Outside of work and involvement with CAPCA, Preston enjoys traveling with his fiancé, Cassidy, and going on weekend trips as often as possible. They love the outdoors and attempt to go on a new hike at least once a month. His other hobbies include running, biking, and swimming. "I began racing and training for triathlons back in 2017 and it has been a huge part of my life ever since." ■

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A study in Washington in a newly planted high-density Cosmic Crisp apple orchard showed similar results. One year later, the untreated trees averaged nine branches per tree. The ROOTERRA-treated trees averaged 14.3 branches per tree(2.).

Wine grapes in Soledad, CA showed a 39.5% increase in the number of bunches and a 20% increase in the number of shoots one year after treating transplants with ROOTERRA. (3.).

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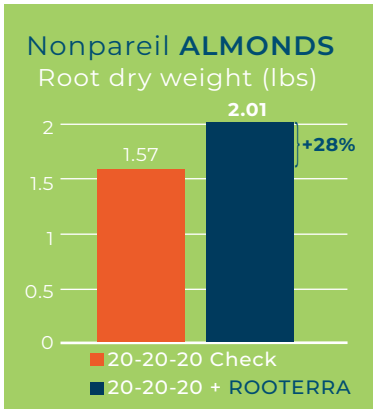

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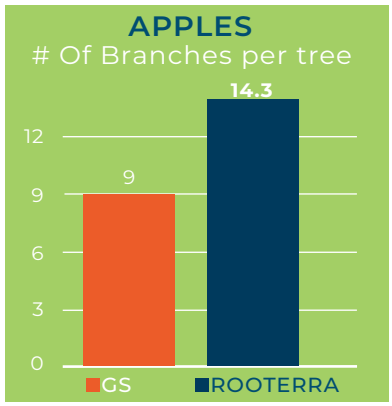

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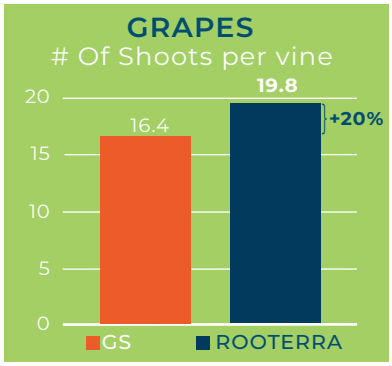

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2020 Scholarship winner announced

Each year, CAPCA, the Stanley W. Strew (SWS) Education Fund, awards a scholarship to an exceptional student who is pursuing a career in the pest management industry. The Stanley W. Strew Educational Fund, Inc., Mission Statement says: *"We promote and communicate the development and implementation of educational and scholarship programs to ensure the future prosperity of our nation's food, fiber and ornamental enterprises."* The Fund is dedicated to establishing educational opportunities and career growth avenues for the students of today and the leaders of tomorrow.

The Stanley W. Strew Educational Fund administers these programs. Applications were distributed to interested students, universities and were posted on CAPCA's website. The CAPCA Scholarship recipient receives $3,000. This year we congratulate our 2020 Stanley W. Strew Scholarship recipient, **Brett Thomason**.

Brett Thomason
2020 CAPCA Scholarship
Brett is a senior attending Cal Poly, San Luis Obispo this fall. His major is Agricultural and Environmental Plant Science with a concentration in Plant Protection Science. Brett plans to graduate in the spring of 2021 and become a Pest Control Adviser and Certified Crop Adviser. After completing his degree and licensing, Brett plans to become an agricultural product salesman, working to make recommendations for pest control products and fertilizer, and designing integrated pest management programs for growers. His experience over multiple summers as a sales intern with Helena Agri-Enterprises, learning from experienced PCAs, has solidified his enthusiasm to build a career in agriculture. One of his references commended Brett on his academic accomplishments, including making the Winter 2020 Dean's list all while pursing work experiences outside the classroom that would a build a strong foundation for his career. Another reference acknowledged his strong work ethic, reliability, and the respect he's earned with customers.

We received the following letter from Brett this summer:

Thank you for choosing me to receive the 2020 Stanley W. Strew Scholarship. This scholarship will be a big help in paying for my senior year of college tuition here at Cal Poly San Luis Obispo. I will be graduating from Cal Poly in June of 2021 and plan to take my PCA and CCA exams shortly after.

Currently, I am working full time for Helena Agri-Enterprises in Santa Maria, CA. I work under salesmen doing tasks such as pulling soil samples, tissue samples, and scouting fields, as well as pulling and delivering customer orders. I am learning a lot about different crops compared to when I was working Brawley, CA during the summer. Here, I get to work with cane berries, strawberries and a variety of vegetables. This fall I will be taking the classes Weed Biology and Management, Plant Pathology, and Biological Control Pest Management. I have been learning a lot in both work and school and this scholarship encouraged me to continue on my path to obtain my degree and licensing as well as greatly reduce my college tuition. This opportunity means a lot to me and I want to thank you for your time and consideration.

Sincerely,

Brett Thomason

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Your CAPCA Member Benefits:

2021 Member Communications

Crystelle Turlo, Individual Membership & Chapter Projects Director

There is no doubt that 2020 has brought changes to the way companies do business. We have had to pivot the way we learn, the way we work, and we are relying more on digital communications than even last year. As we navigate these unchartered waters, CAPCA continues to adapt to meet the needs of our members.

One of our goals for 2021 is to ensure that our members continue to receive communications in ways that are up-to-date and relevant to their license and easy to access. While we did need to make some changes to the way we have communicated in the past, we have also made certain to add more avenues for members to receive information that makes sense.

For long-time members, one of the biggest changes you may notice is when you renew your membership in 2021. Renewing members will no longer receive a Thank you Letter and sticker in the mail after purchasing their membership. Instead, an email acknowledging membership will be sent, and an updated continuing education certificate will be attached. This way our members will know exactly how many hours they have as soon as their membership is processed. Due to this new procedure, we will no longer send unofficial CE certs in February as we have done in years past. We encourage PCAs to utilize the CAPCA website to request to have an CE cert emailed to them within 1-3 days. This allows members to stay up to date on their hours effectively.

We are also developing our social media pages as another approach to communicating to our members. We hope that this will allow for more interaction with members and provide another source of information to those who may not receive it by other channels.

Additionally, we have been working hard to develop CAPCA.com so that it is easy to navigate for our members. As we move into 2021, we will continue to design a "Members-only" area that we envision will provide members with important resources and up-to-date news items.

We continue to utilize email to reach our members about continuing education opportunities, changes in legislature and many other topics that are relevant to our members. Because this method is used for the most important information, we ask that you consider opting in to email communications.

CAPCA does use discretion in regard to how many emails are sent within a week and try to condense our messages to ensure our members are not inundated with numerous emails.

On Wednesdays, our Active members will continue to receive Agri-Pulse, an industry-focused news source that is emailed weekly. Included in this communication is member-relevant information from CAPCA that typically includes updates, notices, and reminders.

The Adviser, CAPCA's bi-monthly magazine will continue to be published and provide the same great content that our members have come to expect.

CAPCA recognizes that our membership is diverse in how they receive their news and communication. Because of this, we have worked hard to provide a variety of ways that will allow for more interaction with our members and provide information to those who may not receive it by other channels. ■

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Proposed regulations, food companies target neonics

Brad Hooker, Agri-Pulse Associate Editor

When California growers worry about fruits, nuts, vegetables and cotton being destroyed by pests, they frequently look to neonicotinoid pesticides for crucial crop protection. Yet, regulators and some food companies continue to push for limits or outright bans on these important crop protection tools.

Earlier this summer, the Department of Pesticide Regulation released a list of proposed mitigation measures to limit the use of four controversial and widely used neonicotinoid pesticides in California.

Ironically, DPR presented the draft regulation just days after news that citrus greening has been making inroads in commercial groves. Researchers detected the first sample in a commercial grove of an Asian citrus psyllid (ACP) that tested positive for the bacteria that causes the disease, known as Huanglongbing (HLB). Neonics have played a critical role in keeping the pest at bay, which means dramatic restrictions on use would have deep impacts for citrus.

While it is still early in the regulatory process and changes are likely to come for the draft regulation, the proposal renews skepticism over the administration's agenda in limiting valuable crop protection tools. Farmers have not yet had a full season to begin to understand the impacts from a recent state ban on another critical insecticide, chlorpyrifos.

Overall, about 60% of California's fruit, nut and vegetable production currently depends on the neonics, along with more than half of the state's agricultural exports. Chlorpyrifos would have been considered an alternative "for multiple crop/pest combinations" covered in the report.

An economic analysis performed by CDFA found that the proposed regulation would cut the number of acres treated with neonics by nearly 70%. The available alternatives to the products would increase costs for citrus growers by more than 50%, adding up to as much as $3 million for the industry each year. HLB would then "spread at a faster rate in the state, jeopardizing the entire industry," according to the study. It would also leave growers vulnerable to future invasive species yet to arrive in California.

Cotton would experience a similar fate, according to the report, with only about 40% or less of its acres able to be treated with neonics. The amount applied would be reduced just as much.

California leads the nation in processed tomatoes. Yet under this regulation, treatment costs would rise as much as 130%, adding up to an additional $7.8 million each year.

The response from a CDFA economic analysis as well as trade groups has been that these cutbacks could be devastating for citrus, winegrape and cotton growers.

"If you add on the neonicotinoids, it's really a death sentence to the California industry," said Casey Creamer, president and CEO of California Citrus Mutual (CCM), in an interview. The industry would slowly erode over time, as happened in Florida, he explained.

DPR released its risk evaluation for the neonics in 2018 and Citrus Mutual has been working closely with the department's staff on the potential regulations. Creamer remains optimistic the proposal will evolve over time to address the many issues being raised. CCM's biggest concern, he said, is that the mitigation measures, particularly for imidacloprid, do not correlate with the 2018 risk evaluation.

"The reaction in the mitigation is to drop the (application) rate down significantly to below efficacy for citrus," he said. "It basically prohibits the use."

Creamer also took issue with an emergency provision in the regulation that would allow for exemptions during ACP outbreaks.

"We're trying to prevent an emergency, not wait till we get one and then be able to use imidacloprid," he said.

With restrictions of just one application per season and at such low rates, many stakeholders raised concerns during workshops that the mitigations would build resistance in pests to the neonics as well as to alternatives.

"For all intents and purposes, they cut the rate in half to protect pollinators," said Ruben Arroyo, the agricultural commissioner for Riverside County, where the ACP detection took place.

The DPR proposal raised a number of questions for Arroyo over enforcement.

"If you've got a grower that can only use it once in a one-and-done type of thing, how would we know if he used it again?" he said.

Arroyo explained that the reporting system for monitoring pesticide use does not have the capability for tracking the many scenarios DPR seeks to enforce. The regulation still allows for some

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Throughout our centennial celebration, we're inviting friends of Wilbur-Ellis to join us in a Giving Program that will help people in need worldwide.

Between July 2020 and our 100th anniversary in June 2021, every month, we'll ask a question for adults and another question for kids on how to make the world thrive. For every response you send, the company will make a $4 donation to the Red Cross (up to a maximum of just over $4,330 a month). The company-funded Red Cross donations will support communities in the U.S., Canada and Asia-Pacific, the areas where our employees live and work.

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crops to have multiple applications of a neonic instead of just one. A new software system would be needed for the monthly reports. It would have to trigger alerts, for example, when an applicator might use two different neonics on the same field in one season.

This would require DPR to implement a new funding mechanism, pulling resources from other DPR duties. Another route the department could pursue is to make the four neonic ingredients restricted materials. But that would require a separate regulatory path and present other problems.

"I've never been in this situation where we've had a chemical that is in the middle of a reevaluation and mitigation and then switch gears into making it restricted," said Arroyo.

During workshops this summer, DPR staff mentioned that the agency is also pursuing a human health assessment for the neonics. Arroyo said an impact on human health would be enough cause to consider regulating the products as restricted material, with the known risks to pollinators adding further momentum. Yet U.S. EPA has already performed a risk assessment that found the neonics to be safe for human health. CalEPA would have to present new scientific information to counter the federal government's findings—the path it pursued in banning chlorpyrifos last year.

At that point, banning the neonics or mitigating them out of practice would create other risks.

"The alternative isn't nothing," said Ruthann Anderson, CEO and president of the California Association of Pest Control Advisers. "You're looking at a whole different slew of potential environmental and human impacts."

As with chlorpyrifos, industry stakeholders, along with environmental advocates and DPR, are reluctant to endorse alternatives that could present unintended consequences, perhaps by requiring more applications or a broad combination of pesticides to achieve the same result.

John Aguirre, president of the California Association of Winegrape Growers, said the neonics have actually been the new and safe replacement for older pesticides like carbamates and organophosphates.

"This was a new class of chemistry that represented a substantial improvement in terms of risk," he said. "It's not clear to me how the current evidence is lacking the current studies and analysis to date in terms of human health risk."

Aguirre was concerned over the regulation's impacts for controlling vine mealy bug, which is a vector for leaf curl virus. The CDFA report notes the mitigations could also present unforeseen setbacks in combatting the glassy winged sharpshooter in citrus groves near vineyards, since the pest can then spread the devastating Pierce's disease to wine grapes.

Aguirre pointed out that grapes make a very poor forage crop for pollinators, which the regulations seek to protect.

Anderson hopes DPR will make more informed decisions for protecting pollinators based on data already at hand. This is the first year for the state's BeeWhere platform to be fully operational. The online pesticide notification tool aims to prevent accidental colony exposures during applications. This year beekeepers registered more than 1.5 million honeybee colonies with the program.

"BeeWhere is basically tied into the pesticide use reporting," she explained. "If there were bee kills or if there were reported issues, then all of that could be investigated and tied together through the two systems."

This would allow DPR to track colony losses back to a specific pesticide application or to other potential causes, such as pesticides a beekeeper applied to control deadly varroa mites. This would give DPR a more realistic reporting of the actual issues, rather than depend on results performed in a confined lab space, she said.

Since the ban on chlorpyrifos, a number of farmers and other stakeholders have taken issue with how the administration is limiting the tools as well as the opportunity for applicators and pest control advisors to choose the best practice. The administration has said that both the ban and the proposed neonic regulations are part of what DPR Director Val Dolcini describes as sustainable integrated pest management (IPM).

"More broadly, what we're trying to do as a department is to shift the paradigm, in many ways, from our reliance on synthetic chemical pesticides to one that focuses more on safe, sustainable pest management techniques and tools and practices and protocols," he said during one of the workshops.

Before joining the administration in 2019, Dolcini was CEO of the Pollinator Partnership, a group that has worked with the agriculture industry on bee protection practices, including a high-profile partnership with the Almond Board of California earlier this year.

But even as the agriculture industry ramps up efforts to track and protect pollinators, one of the nation's largest snack companies announced that it wants to see its suppliers eliminate use of many crop protection chemicals in almond production.

KIND Healthy Snacks said it expects its almond suppliers to reserve 3-5% of their farmland for dedicated pollinator habitat to support bees, butterflies and other pollinators. In addition, KIND said it has worked with its suppliers to eliminate any use of neonicotinoids and chlorpyrifos.

In addition, the KIND Foundation will also make a $150,000-investment in the Williams Lab at the UC Davis to help answer critical questions about bee health and track the efficacy of these farm-level improvements.

California currently produces the vast majority of the world's almonds, with nearly 1.53 million acres in 2019, according to CDFA. However, KIND said in a release that only a small fraction of that acreage — estimated at less than 20,000 acres — is verified as bee-friendly. ■

Update on neonicotinoids draft proposed regulations

By CAPCA Staff

As PCAs, this is a key time for your voices to be heard about the value of a robust IPM toolbox to address seasonal and emerging pests and diseases. In July 2018, DPR issued a pollinator risk determination for neonicotinoids. The Department of Pesticide Regulation (DPR) concluded that additional mitigation measures were needed to protect pollinators from the use of the nitroguanidine-substituted neonicotinoids imidacloprid, thiamethoxam, clothianidin, and dinotefuran in agricultural crops. DPR intends to implement mitigation measures through regulations.

DPR held two webinars in early August to share information and gather feedback from the public on proposed pollinator protection mitigation measures for the use of nitroguanidine-substituted neonicotinoids in agricultural crops. You can find the draft proposed regulations: https://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/proposed_regulation_text.pdf

In addition to the webinar feedback stakeholders are encouraged to provide additional feedback on the proposed mitigation measures. Comments can be submitted by e-mail to neonics@cdpr.ca.gov or you can leave verbal feedback by leaving a voicemail message at 916-445-0003. The voicemail recording is limited to three minutes. ***Feedback will be accepted until October 11, 2020, at 5:00 pm PDT.***

CAPCA Response

Through BeeWhere, CAPCA has prioritized pollinator protection and greater communication between stakeholders to safeguard pollinators. Over the past year, CAPCA has participated with commodity groups in a Neonic Workgroup to better coordinate responses and share updated information.

The August webinars, along with reports and studies released since have unfortunately brought more questions than answers on the scientific reasoning behind the proposed draft regulations and real impacts to growers with restricted applications or potential loss of neonicotinoids. *What are the IPM toolbox alternatives if applications are restricted or prohibited? What are the potential unintended consequences of moving counter to IPM methodology in only allowing one type of active ingredient and one type of application method per season?*

PCA Response

Comment periods have become increasingly political, with the total number of comments on each side weighing far greater than the quality of comments or how scientifically focused remarks are. Coalition letters have been a focus of CAPCA Advocacy efforts for years, but we recognize that it is no longer enough for just CAPCA to voice their concerns on behalf of the PCA. The PCA must engage on behalf of the IPM toolbox. Over the coming weeks, CAPCA will be providing a streamlined comment process to help CAPCA Members engage. If your crop is impacted by threat of new restrictions by these proposed regulations including de facto cancelation for some commodities, or if you believe in a science-based approach to regulatory change, your voice matters. ■

Duck Duck Turtle: Antibiotic immunity transmission to algae

Patrick Simmsgeiger, President, DWI

During these uncertain times related to Covid-19, there are still things we can do to prepare our businesses and properties for the new-norm which is certainly around the corner. Although this piece may initially add to your list of concerns, hope springs eternal that knowledge can be acted upon, and good stewards can make difficult decisions to protect all stake holders.

I remember my mother refusing to get a turtle for me as a pet. She understood that turtles transmitted *salmonella*, but she probably had no idea baby turtles also transmitted *hepatitis-B*. She told me not to touch the ducks in the neighborhood lake. She probably heard they hosted *alpha-herpes* virus, which caused high mortality rates in ducks, geese and swans. This disease first appeared in Long Island in 1967, transmitted from European flocks. In the last 50 years, these health threats have spread worldwide and normalized in the public mind. There is emerging evidence that turtles, ducks and geese, adapted to the diseases they carry, spread antibiotic-resistant bacteria. As an aquatic expert, what keeps me awake some nights is the possibility these bacterial strains could transfer their resistance to water algae.

Ducks and turtles are as ubiquitous to water environments as shells on a beach. These water species excrete waste with bacterium, which settles into soil already laced with antibiotic run-off from human activity. This long-term buildup becomes a habitat for new generations of bacteria. In a scientific study of a Meat Duck Farm conducted in 2017, the data indicated that the deeper the excrement layers, and the longer these layers went without removal, the more numerous the antibiotic-resistant bacterial species, plus the greater number of antibiotics to which these species showed resistance. These bacteria also evolved resistance to Zinc, Copper and Cadmium. Copper is the primary element used to control algae and cyanobacteria in water. A Harmful Algal Bloom(HAB) is the result of runaway algae and cyanobacteria growth when heat and nutrient loading are abundant, and eco-diversity is low. HABs can be extremely toxic.

Could algae learn antibiotic and copper resistance from bacteria? Algae are in every environment on the Earth, having emerged as a simpler species about 1.7 billion years ago. Bacteria existed a couple billion years before that. Cyanobacteria preceded these by about 1 billion years, being the first life on this planet. Clearly these species learned or stole abilities from each other, then continued to evolve to the present day. It would be very unlikely that this adaptive behavior has suddenly come to a stop. More likely, these microorganisms are reacting to human activity, feeding on modern waste, adapting to our chemicals, while they continue to compete and learn from one another. Microorganisms comprise the vast majority of biomass, which has always been true and will probably always be true; humans are a recent experiment.

Many aquatic companies that treat algae promise to eradicate the problem. The fact is, algae colonies cannot be completely eliminated, only limited in size and reproduction by using proper tools and procedures. Not only are there immense varieties of algae and bacteria adapted to every environment, but each cell of a species has the capability to create a daughter with new characteristics. If human teenage girls are tough, they have nothing on microorganisms. According to a recent estimate, there are about one trillion species of microbes on Earth, and 99.99 % of them have yet to be classified. Clearly, microorganisms have no problem evolving through adaption, with the newer species adapted to consume the most abundant form of nutrients, while resisting threats that limited their mother cells.

Once we accept the possibility of an inter-species exchange of resistance, what is the possibility this new algae strain would move out of its home pond? The same bird groups that excrete large amounts of waste also move from lake to lake. Birds visit all the water features in their territory but have a favorite spot; turtles have a capacity to travel as well. The wind plays a large role in transporting bacteria and other microorganisms over long distances. Empirically, the entire Earth is covered by microorganisms well-suited to each set of conditions. 'Survival of the Fittest' is the rule, so there is every reason to believe that once a species can resist local defenses, it will find a way to spread to every nutrient source available.

Aquatic experts rely on a limited number of products to control algae, ultimately using copper as the active control ingredient, when more subtle treatments fail. Although antibiotic resistance is a problem all its own, it is algae's resistance to copper that presents global concerns. But what can be done; is this an inevitable response of Nature to human activity? The most obvious step is to reduce human runoff into streams and lakes, which is a solution beyond the scope of aquatic managers. Next is the cleaning of muck layers from lakes and ponds, which is effective and doable, but not cheap. This step is commonly delayed for years, even decades, for budget and permit reasons. The last solution is the control of bird and turtle populations, which is an easy action to consider, but socially and politically difficult to carry out.

Reducing bird and turtle populations first runs into regulatory issues. These restrictions have nothing to do with *The Endangered Species Act of 1973*, but rather stem from public opinion. A complicated permit process, adding costs & delays, plus Public Relation issues are the bane of property managers and municipalities. Restrictions on turtle, bird and fish removal are commonly the final straw that defeats even a permitted plan. There is a San Francisco property that requires humane fish euthanizing, beginning with a gentle capture, then freezing, and finally a chemical soft-wash. After many years they are still looking for a contractor. Most water features in the United States are decades beyond their life-span for muck removal. This delay in cleaning exacerbates and encourages the biologic risks, while also limiting water health overall.

Being alarmist in no way benefits a professional discussion, or any form of governance. Water management experts think in terms of years at a property, drawing on decades of experience. Yet recent events have demonstrated how quickly the status-quo can change, how our assumptions about safety can become obsolete. In 1967, Avian Infectious Bronchitis Virus was studied as a crossover vector for human bronchitis. Interestingly, this was the same year flocks were found dead in Long Island from a European infection. Today, we may be ignoring signs of a larger problem, where algae could incorporate antibiotic and copper resistance from bacteria, vectored through birds and turtles, which densely populate neighborhood water features. Even if we recognize the signs, our hands remain effectively tied by sentiment for these adorable creatures, many of which we encourage to live in our underserved lakes. ■

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Successful Outcomes in California's Current Political Environment Require Coordinated Advocacy and Political Programs

Joshua C. Walters, Esq., Walters Strategies & Media, Inc.

The political landscape in California is constantly evolving, with power dynamics shifting between interests and factions on a routine basis. While advocacy and lobbying efforts directed at policymakers have long been professionalized, the complexities of California's near constant political campaign cycle has led organizations to pursue the professionalization of their political operations in a parallel manner.

Indeed, the most successful organizations have advocacy and political teams that work in a coordinated effort to: (1) Achieve the goals of their organization with current policymakers; and (2) Work to set the playing field so that the organization has a greater likelihood of success with future policymakers.

This year, CAPCA joined the Alliance of California Farmers and Ranchers (ACFR) to incorporate this approach into their advocacy efforts. The CAPCA Board was contacted with the primary focus of this mission to impact the California legislature, the strategy is presented through the lens of two-year election cycles as outlined below. This investment in ACFR allowed CAPCA to diversify advocacy efforts and support the broader efforts of the industry stakeholders to shift the tone of the legislature towards ag and business friendly representatives.

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2019-2020 Election Cycle: Establishing Credibility & Coalition Building.
Our primary goals for this election cycle are to establish credibility for ACFR in the Sacramento political community and to conduct coalition building. These goals are complementary – as credibility increases, opportunities to partner with other political actors also increases.

2021-2022 Election Cycle: Redistricting & Seizing Resulting Opportunities.
Upon completion of the U.S. Census, the Constitution requires the states to complete a redistricting process to preserve the one-person one-vote requirement. California, through voter initiative, places this responsibility with an independent body known as the Citizens Redistricting Commission (CRC), comprised of citizen commissioners.

The CRC has recently completed the process of being formed and is working to stand up the Commission, including hiring key staff and consultants. In 2021, the CRC will conduct a series of hearings focusing on communities across the state in order to receive testimony that will ultimately be used to draw California's legislative and congressional districts. The CRC will conduct this task without preference for protecting incumbent legislators. The Commissioners are also prohibited from considering party preference and voter registration concentrations in their deliberations. Essentially, the CRC cannot draw "Democratic" or "Republican" districts. Instead, the Commission must use a non-political lens to focus exclusively on the nature of the communities themselves and how they are best aligned in a legislative district, in so-called "communities of interest."

This presents an opportunity, through a coordinated effort with our coalition partners, to mobilize grassroots advocates to make sure that all voices, including our community, are considered as the CRC deliberates how districts are drawn for the 2022-2030 election cycles.

The new legislative district lines will be finalized by the end of 2021, in anticipation of the 2022 election cycle. This could result in a series of opportunities in California's legislative races. Some districts may be drawn in a manner that places two incumbents in the same district, potentially creating open seats. Similarly, because partisan registration is prohibited from consideration in the line drawing process, districts may move from being safe Democrat/Republican to being competitive. For 2022, ACFR will be prepared to seize opportunities that present themselves and will also be ready to defend those friendly legislators that may find themselves negatively impacted by the redistricting process.

2023-2024 Election Cycle: The Big Term-Out.
Through voter initiative, Proposition 28 (2012), California revised our legislative term limit laws so that, starting in 2012, members of the legislature could serve no more than 12 years, but all of that time could be served in one legislative house. The previous term limit requirements were for no more than 14 years total, but with specific time requirements per legislative house; 8 years (2 terms) in the Senate and 6 years (3 terms) in the Assembly. The goal of Proposition 28 was to slightly lessen the total time available to serve, but to eliminate the churn of legislators between the houses, leading to more experienced legislators. Indeed, under the prior term limit laws, the most experienced an Assemblymember could be, by law, was 6 years and then they were forced out by term limits.

Under our revised term limit laws, the 2012 class of legislators will run up against their term limits during the 2023-2024 election cycle. The result is that there will be a large amount of change in both the Senate and the Assembly during this election cycle. Of the 120 members of the legislature, a total of 39 legislators will be termed out, creating 39 open seats for the 2023-2024 election cycle. This includes both current legislative leaders, the President pro Tempore of the Senate and the Speaker of the Assembly.

This change will present an opportunity to change the composition of the legislature, both to challenge competitive seats because of the lack of an incumbent as well as the opportunity to support more moderate candidates in primary elections for safe Democratic/Republican seats.

November 2020 Elections – $12 Billion "Split-Roll" Property Tax Increase Will Impact California's Agriculture Industry.
While these days it may feel like a lifetime ago, in January of 2020 Governor Newsom indicated that he was expecting California to have a budget surplus exceeding $20 billion for the 2020-21 fiscal year. Few things are ever clear in California politics, but the vastness of the projected budget deficit demonstrates to many the absence of the need for new tax revenue – quite the opposite.

Despite this, two of California's largest and most powerful unions, the California Teachers Association and SEIU California, spent 2019 and early 2020 drafting and qualifying a ballot initiative that seeks to undermine California's longstanding protections for property taxes known as Proposition 13 (1978).

This new ballot measure effort ultimately qualified for the November 2020 General Election and is officially titled Proposition 15 (2020), which the unions call the "Schools and Communities First" initiative.

ACFR is taking a leadership role to educate the ag community and the voters about the true impacts of Proposition 15 on our industry and way of life.

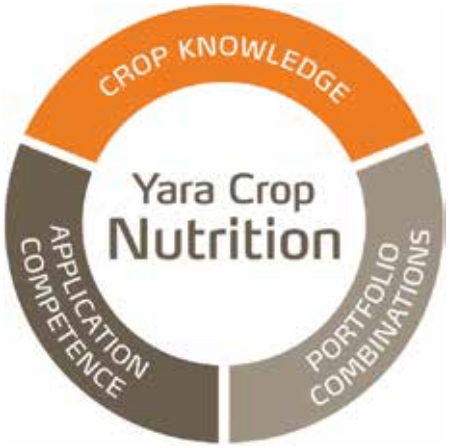
Background on Proposition 13 (1978).
In order to protect taxpayers from skyrocketing and unpredictable property tax bills, in 1978 voters passed Proposition 13 which assigns property tax values to 1% of the property's original purchase price, plus improvements, as opposed to current value. Providing additional protections, Proposition 13 (1978) also capped property tax increases to 2% per year or inflation, whichever is lower.

Together, the protections in Proposition 13 (1978) ensured that tax bills were predictable and that any potential increases were reasonable – two key factors that business owners crave, and government rarely delivers.

It is also important to note that Proposition 13 (1978) ensures that all real property is treated equally. Residential and commercial property owners all benefit from Proposition 13's requirement of reasonable and predictable property tax bills.

Building a Complete Nutrition Program

At Yara North America, we understand the value of a complete nutritional program is significant now more than ever. The existence of increasing regulations, decreases in crop protection tool registrations, and consumer interest in the sustainability of production practices can be positively navigated by implementing comprehensive crop nutrition programs.



Understanding field-specific nutrient profiles, crop demand curves, and nutrient application strategies to meet demand, are the first steps to a successful crop. A complete crop nutrition program starts with an assessment of chemical and physical properties of each field from soil and tissue samples. A review of cropping history will provide an estimation of expected yield targets and pest scouting blueprints. Crop demand curves play an essential role in determining application timings to meet critical demand periods during the crop cycle and a roadmap for nutrient source selection to meet logistical constraints at specific timings. When these elements are properly accounted for, crops are able to effectively mitigate biotic and abiotic stresses, growers are more profitable, and the industries that we serve are recognized around the globe as responsible producers and land stewards.

As a major provider of specialized crop nutrition advice and fertilizers worldwide, Yara is committed to providing the industry with the latest scientific information. This, together with the practical experience of our agronomists, gives Yara a comprehensive understanding of the nutritional needs of crops and the ability to assist crop advisors in developing complete fertility programs that provide maximum value to their customers. Yara's commitment to supporting retail partners and crop advisors is evidenced in the multiple layers of support from Sales Agronomists, to Regional Sales Managers, YaraVita Specialists, and Crop Managers. These roles are structured to support the industry by implementing demo trials, prescribing products to meet critically specific nutritional needs, and committing to comprehensive crop solution-based research.

We encourage all CAPCA members to participate in Yara's journey to responsibly feed the world and protect the planet by visiting us at the Yara Incubator Farm. Here, through collaborative efforts with customers, partners, and various technology providers, Yara has committed to years of field-scale research on permanent crops in California to advance our complete crop nutrition portfolio. Research efforts will allow us to more effectively assess complete crop nutrition programs and provide Crop Advisors absolute confidence in their crop nutrition recommendations. The Yara Incubator farm is a place to explore, evolve, refine, and share knowledge of crop solutions for growers, partners and the industry.

Whether your needs are training, collaboration, crop program support, innovation, or field-scale R&D, we're here to support you!

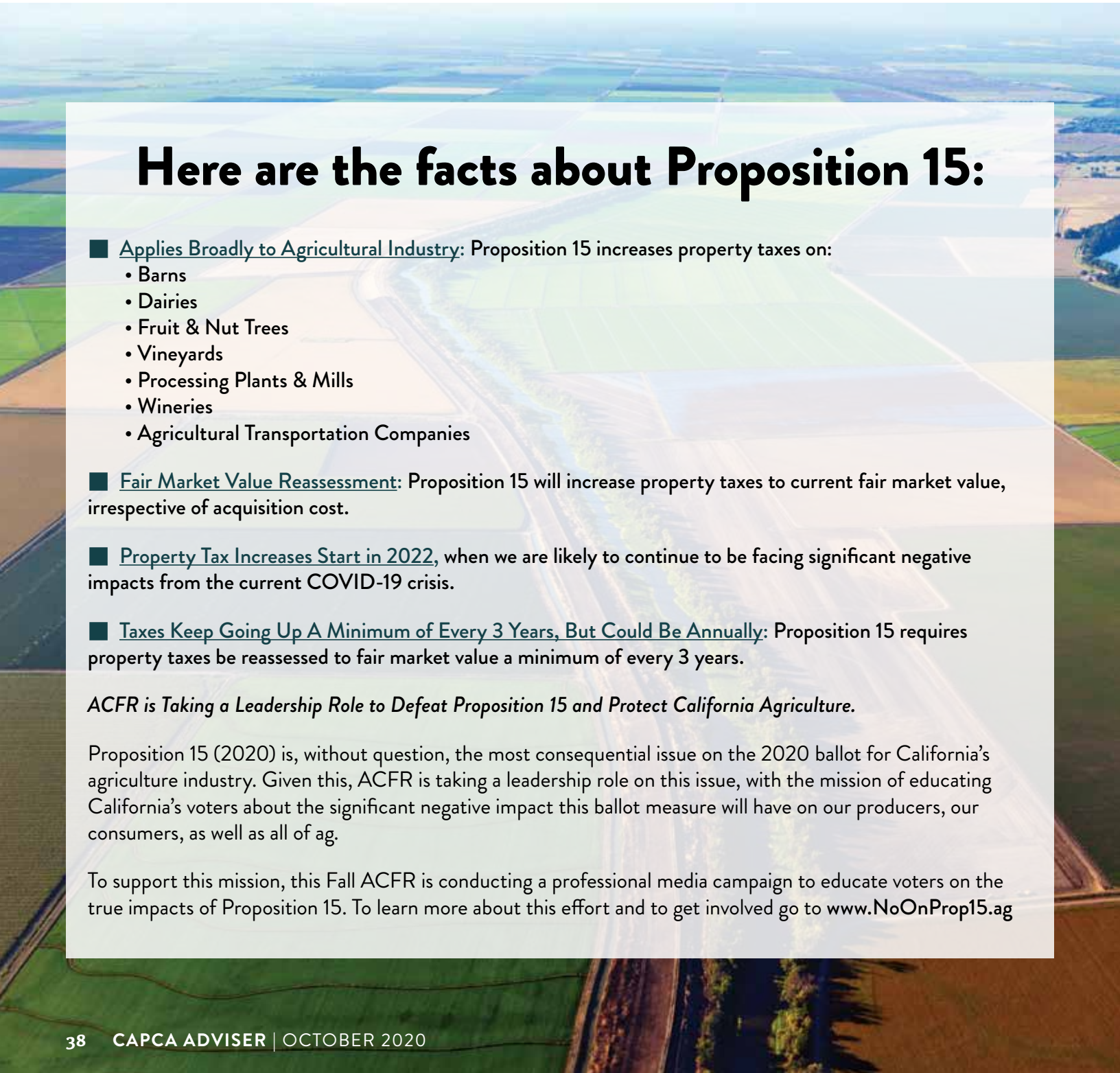
What is "Split Roll" for Property Taxes?
Each of California's 58 counties maintains a tax roll, the official list of the properties subject to taxation. The so-called "split roll" concept is where the tax roll is "split" by property type to create separate tax rolls that receive different taxation formulas. For those seeking to raise taxes, the strategy typically involves treating residential property preferably while splitting off non-residential property and subjecting that class of property to increased tax formulas.

Proposition 15 (2020) Seeks to Utilize a "Split Roll" Strategy to Significantly Raise Property Taxes on California Agricultural Property to Fair Market Value At Least Every Three Years.

Should it pass, Proposition 15 (2020) is poised to be one of the largest tax increases in California history, hitting taxpayers with an estimated $7.5 to $12 billion dollars in increased property taxes according to data from the non-partisan Legislative Analysis Office.

Proposition 15 will have a direct impact on California agriculture – raising property taxes broadly from fruit and nut trees to dairies to our food processors and mills and the transportation we use to get it to the grocery store – to name just a few.

Most troubling, the proponents of the measure deceptively claim that the increases somehow exclude "agricultural production." ■



Here are the facts about Proposition 15:

■ Applies Broadly to Agricultural Industry: **Proposition 15 increases property taxes on:**
- Barns
- Dairies
- Fruit & Nut Trees
- Vineyards
- Processing Plants & Mills
- Wineries
- Agricultural Transportation Companies

■ Fair Market Value Reassessment: **Proposition 15 will increase property taxes to current fair market value, irrespective of acquisition cost.**

■ Property Tax Increases Start in 2022, **when we are likely to continue to be facing significant negative impacts from the current COVID-19 crisis.**

■ Taxes Keep Going Up A Minimum of Every 3 Years, But Could Be Annually: **Proposition 15 requires property taxes be reassessed to fair market value a minimum of every 3 years.**

ACFR is Taking a Leadership Role to Defeat Proposition 15 and Protect California Agriculture.

Proposition 15 (2020) is, without question, the most consequential issue on the 2020 ballot for California's agriculture industry. Given this, ACFR is taking a leadership role on this issue, with the mission of educating California's voters about the significant negative impact this ballot measure will have on our producers, our consumers, as well as all of ag.

To support this mission, this Fall ACFR is conducting a professional media campaign to educate voters on the true impacts of Proposition 15. To learn more about this effort and to get involved go to **www.NoOnProp15.ag**

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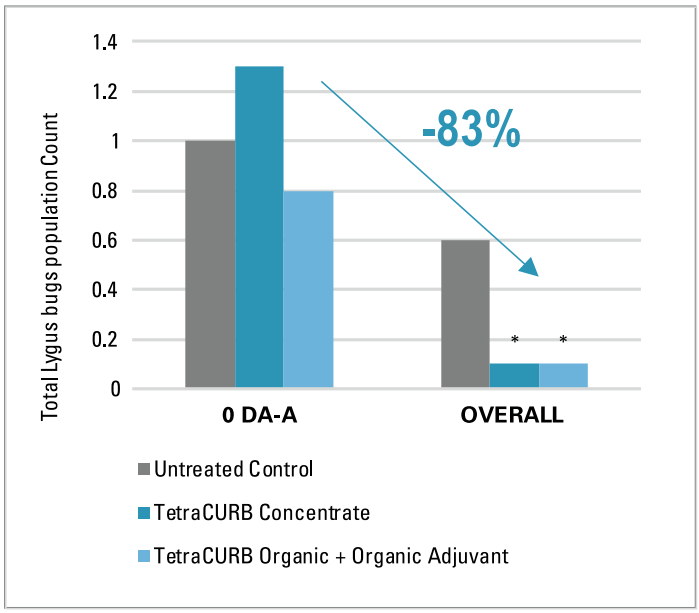

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- TARGET PESTS: Small soft-bodied insects such as aphids, lygus bugs, mealy bugs, mites, thrips and whiteflies. Adult and nymph stages
- Foliar spray application, minimal PPE
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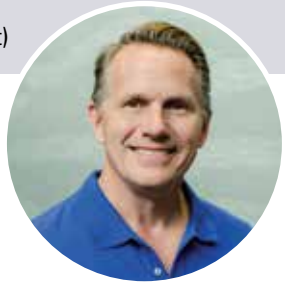
- TetraCURB Organic is safe on bees (data available upon request)



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CONTACT RICHARD JONES FOR MORE INFORMATION ABOUT THIS TRIAL AND HOW TO INCLUDE TETRACURB IN YOUR ROTATION PROGRAM!

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Invasive tree-of-heaven is a preferred host for two invasive insect pests that cause economic damage in California agricultural crops

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

It is not uncommon for commercial agriculture to share a common boundary with riparian, forested or urban areas in California. Some pest species thrive in these border areas and serve as a source of insect pest pressure on neighboring commercial crops. Invasive species that find preferred hosts in these border areas can be especially problematic in that their new environment lacks the predators from their native habitat that would normally suppress and keep their population manageable. This uncontrolled population growth can result in significant economic damage to nearby commercial crops.

The tree-of-heaven (TOH), *Ailanthus altissima*, is an invasive tree that has been documented in 45 states including California. This deciduous tree can be found in agricultural, urban, riparian and disturbed forested areas (Fig. 1A, 1B). This tree serves as a preferred host of two invasive species: the brown marmorated stink bug (BMSB), *Halyomorpha halys*, and the spotted lanternfly (SLF), *Lycorma delicatula*.

In California, BMSB is established in 16 counties and detected in 23 additional counties. BMSB has over 170 host species (fruit, nuts, vegetables, and ornamentals) including the following agricultural crops: grape, pear, apple, stone fruit, citrus, blueberry, raspberry, blackberry, fig, almond, hazelnut, sunflower, sweet corn, soybean, okra, bell pepper, green bean, tomato, and eggplant. To date, in California, BMSB has been observed causing damage in commercially grown almond, apple, peach, and pear orchards.

The SLF has been recorded in six East Coast states but has not yet been documented in California. This insect lays eggs on plant and nonplant items such as stones, pallets, outdoor furniture, railway cars, firewood, and vehicles, which contributes to their wide dispersal ability and their likelihood of unintentional introduction into California. The SLF has at least 40 host species (fruit, nuts, ornamentals, and woody trees) found in North America including the following agricultural crops: grape, stone fruits, apple, blueberry, fig, hops, walnut, and almond.

BMSB and SLF share some similarities. Both are native to China, introduced into the U.S. via Pennsylvania, cause economic damage in a range of commercial crops found in California, and aggregate in large numbers. The tree-of-heaven is a preferred host.

In addition to supporting the growth of economically damaging insect pests, the tree-of-heaven has its own impacts on the ecology of areas where they establish. The tree-of-heaven competes with native plants and trees by releasing allelopathic chemicals that prevent the establishment and inhibit the growth of native trees nearby (Fig. 1C). The tree has a rapid growth rate of 3 to 6 feet a year and is able to start bearing seeds within 2 to 3 years. Female trees can produce more than 300,000 seeds (Fig. 2A) that are easily dispersed by the wind allowing for new trees to establish some

Figure 1. Tree-of-heaven is a deciduous tree that can be found in agricultural, urban, riparian and disturbed forested areas. Photos: Cindy R. Kron, UC IPM.

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distance from the parent tree. Established trees can also spread by sending up root suckers up to 50 feet from the parent tree. In addition, small root fragments can also generate new shoots. An injured or cut tree-of-heaven responds by producing numerous root sprouts that allows the tree to spread prolifically and complicates efforts to remove the invasive tree. The tree-of-heaven is a high pollen producer aggravating those with allergies. Direct contact can cause skin irritation and, in rare cases, inflammation of the heart muscle has been documented from exposure to sap through broken skin. These features of tree-of-heaven fuels its ability to invade new environments and makes it very difficult to remove after it has become established.

Being that the tree-of-heaven is invasive and also supports two invasive insect pests that are known to cause economic damage in a range of commercial agriculture crops grown in California, it is important for the agriculture industry to become familiar with how to identify the tree-of-heaven. This knowledge can be used to increase the awareness of the proximity of these trees to host crops that you work with, manage or own. Calculated management decisions can then be made from this information.

The tree-of-heaven is similar in appearance and can easily be confused with a handful of native tree species: black walnut (*Juglans nigra*), winged/shining sumac (*Rhus copallina*), ash (*Fraxinus* spp.), staghorn sumac (*Rhus typhina*) and butternut walnut (*Juglans cinerea*). Young tree-of-heaven have greenish smooth bark (Fig. 3A) that turns a greyish-brown in older trees resembling the skin of a cantaloupe (Fig. 3B). Leaves have a central stem with 10 to 40 leaflets attached on each side by a short petiole (Fig. 4A). A V-shaped or heart-shaped scar is noticeable when a leaf is broken off of the main stem (Fig. 4B). The margins of the leaflets are smooth with one to two bumps called glandular teeth that protrude at the base of each leaflet near the petiole (Fig. 4C). A corresponding gland is located on the underside of the leaflet where the glandular teeth are located (Fig. 4D). A strong odor described as cat urine, rancid cashews or burnt peanut butter is given off when the leaves or stems are crushed. Twigs break easily exposing a brown spongy pith. Tree-of-heaven are dioecious with separate male and female trees. Female trees produce red, yellow and green "samaras" that each contain one seed covered by a winged and papery tissue used in wind dispersal (Fig. 2B).

Agricultural land and nearby areas should be inspected for existing tree-of-heaven stands. There are different strategies that can be followed upon identifying this tree in or near farmed land. The first strategy is to use the tree-of-heaven as a sentinel tree that is visually inspected periodically for the presence of BMSB and SLF life stages during the growing season. This would be an easy and ideal option if either invasive pest is not reported in your county or nearby counties. Early detection can help prevent establishment in your county and the economic damage that these invasive species

Figure 2. Female trees can produce more than 300,000 red, yellow and green "samaras" that each contain one seed covered by a winged and papery tissue used in wind dispersal.
Photos: Cindy R. Kron, UC IPM.

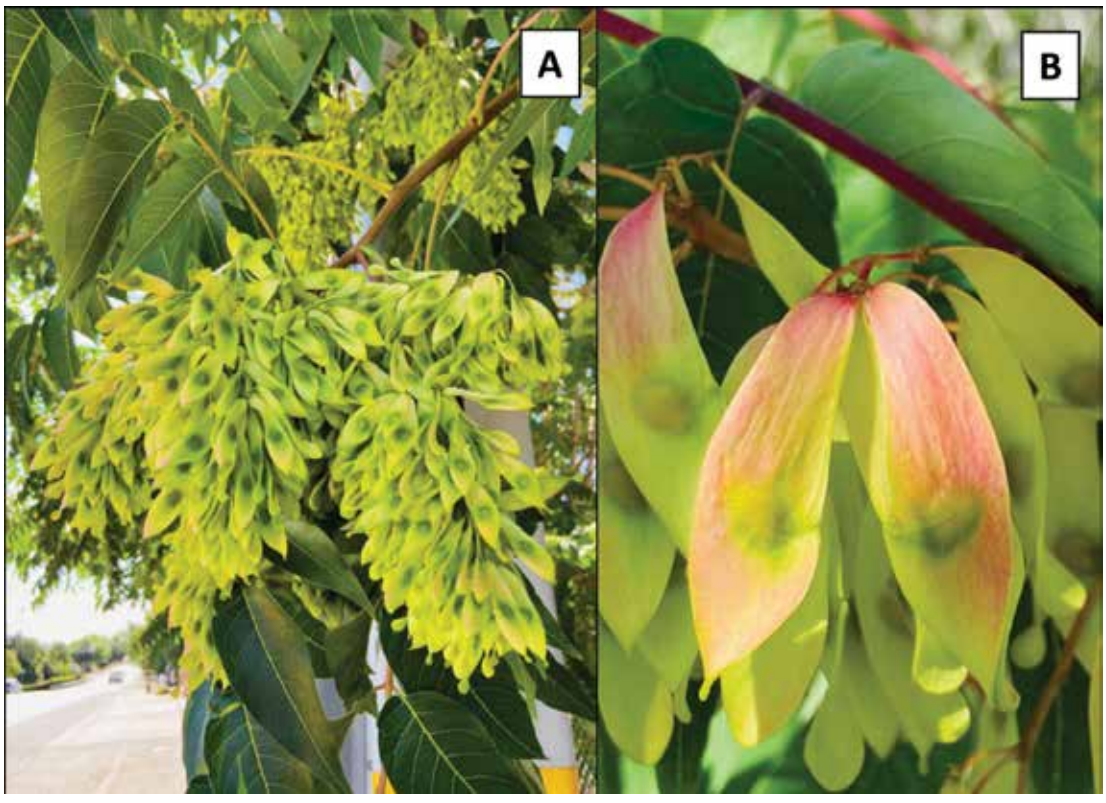


Figure 3. Young tree-of-heaven have greenish smooth bark (A) that turns a greyish-brown in older trees resembling the skin of a cantaloupe (B). Photos: Cindy R. Kron, UC IPM.

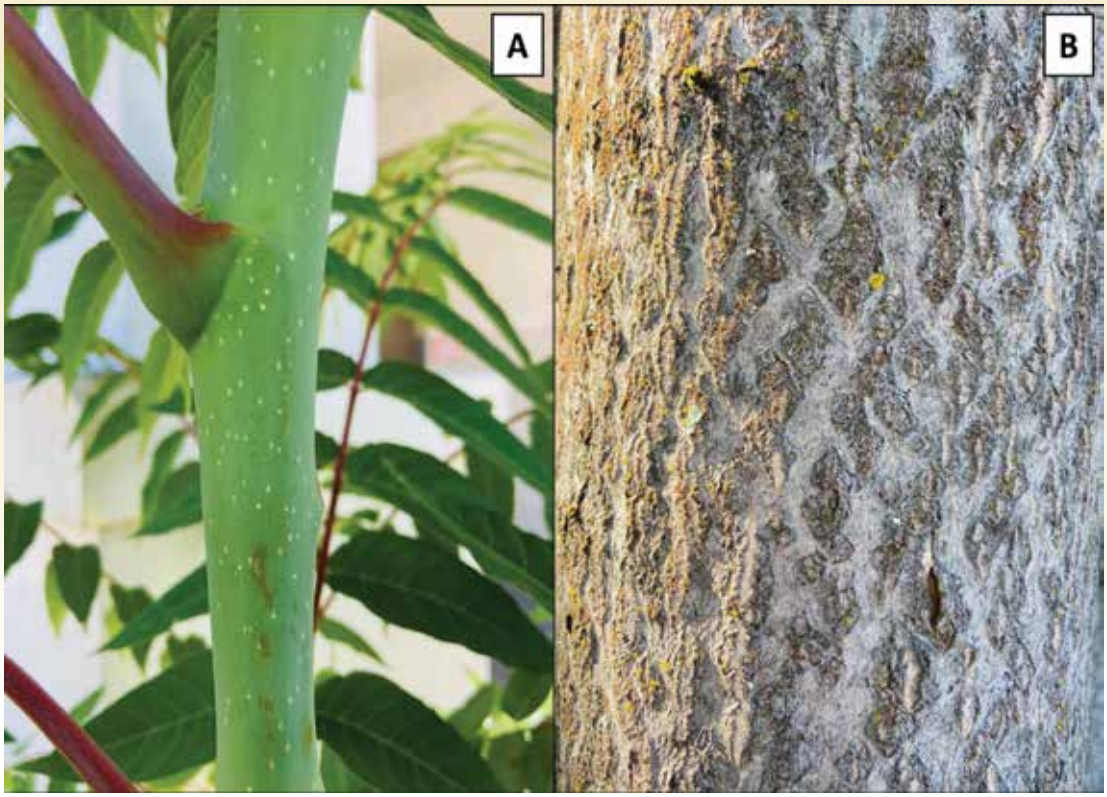
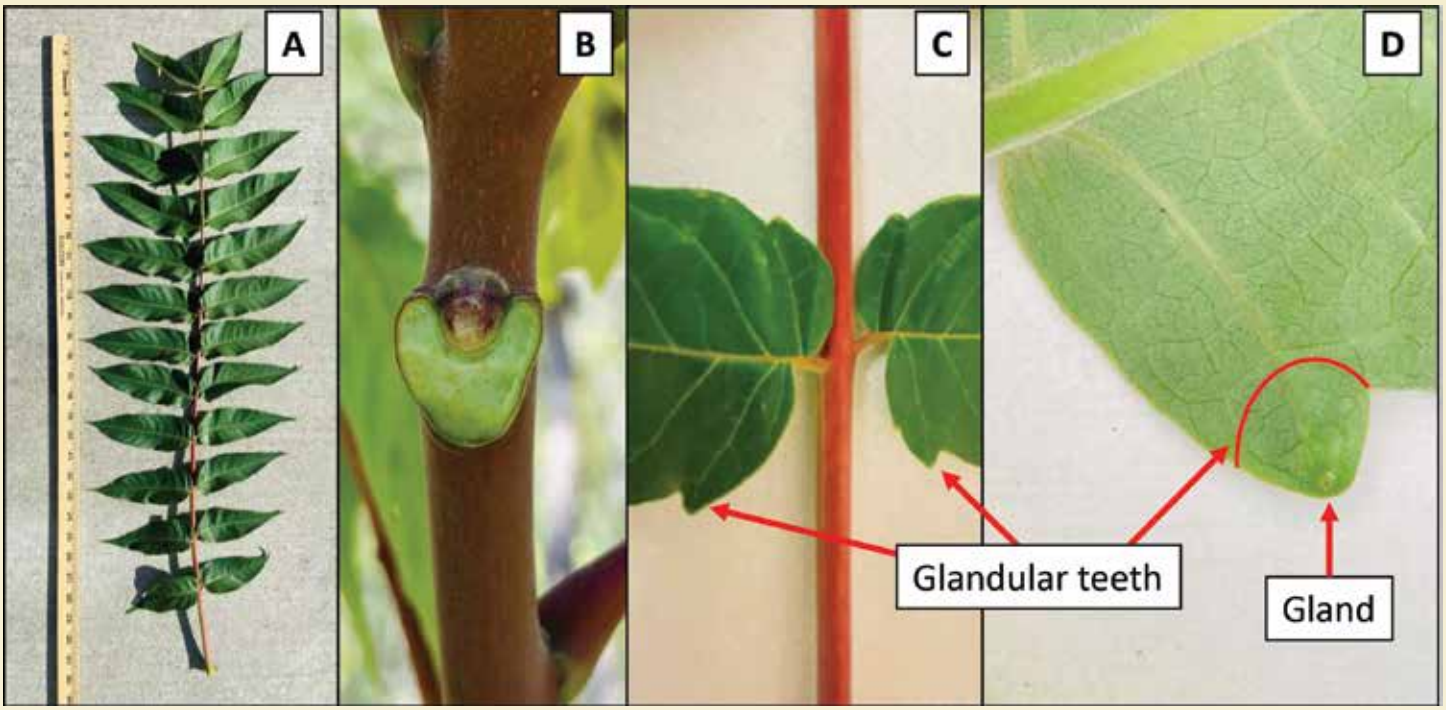


Figure 4. Leaves have a central stem with 10 to 40 leaflets attached on each side by a short petiole (A). Leaves broken off of the main stem leave a V- or heart-shaped scar (B). The margins of the leaflets are smooth with one to two glandular teeth that protrude at the base (C). A gland is located on the underside of the leaflet where the glandular teeth are located (D). Photos: Cindy R. Kron, UC IPM.



cause in commercial crops. Any sightings or insect samples should be submitted to your local county agricultural commissioner's office.

A second strategy could be used if detections of either invasive species have occurred in your county or local area. Traps for BMSB monitoring can be deployed using a double-sided sticky panel with a dual lure and placed near the tree-of-heaven. If SLF were to arrive in California, brown sticky bands wrapped around the trunks of tree-of-heaven can capture the immature stages as they engage in their typical behavior of walking up the tree. Trap finds can alert growers of an invasive species presence in an agricultural field and treatment decisions can then be made.

A third strategy would be to remove tree-of-heaven, but this comes with a warning: mowing or cutting, by themselves, are ineffective and can cause the tree to spread prolifically. Care needs to be taken when deciding to remove tree-of-heaven since a cut tree responds by sending up numerous root sprouts up to 50 feet from the parent tree. Timing of treatment and commitment to follow up with subsequent treatments the following year are crucial for success. If tree removal is the decision made, the root system should be targeted with a systemic herbicide 30 days before cutting the trees and the application needs to be made between July and mid-October when carbohydrates are being allocated to the root system. If an herbicide is applied outside of this range, the application would likely be ineffective due to targeting the above ground growth and not the root system. Gloves, long-sleeved shirts and pants should be worn during tree removal to prevent the contact of tree parts and sap with the skin. Follow-up monitoring is needed to determine the need and timing of additional treatment applications. ■

KASUMIN® Bactericide: A Welcome Solution for California Bacterial Disease

Almond and walnut growers and PCAs know all too well how difficult bacterial diseases are to control. From blight to bacterial blast, the effects can take a toll on an orchard if the disease gets out of hand. Lucky for California growers and PCAs, KASUMIN® Bactericide is emerging as a trusted ally for managing bacterial blast in almonds and blight in walnuts. Registered for use in more than 20 countries worldwide, KASUMIN is helping growers take charge of their orchards.

UNIQUE MODE OF ACTION

Kasugamycin, the active ingredient in KASUMIN, features a unique site of activity and mode of action, making the product an ideal match for resistance management strategies. The bactericide also features a high level of preventative activity, so it's effective on a wide array of plant pathogenic bacteria.

"Kasugamycin disrupts the function of the ribosomes, which shuts down the energy of the bacteria," says David Davies, Marketing Manager, Specialty Crops, UPL. "By targeting a different site of action from other bactericides, KASUMIN gives growers and PCAs a new tool to control bacterial diseases and protect tree health and yields."

LOCALLY SYSTEMIC IN GREEN TISSUE

The bactericide acts mainly as a preventative and is applied to coincide with early shoot emergence and bloom, which places a protective layer of the bactericide on emerging green tissue and blossoms. KASUMIN acts as a locally systemic bactericide. In addition to controlling plant diseases on contact, the active ingredient in KASUMIN is absorbed by the plant's green tissue and provides even broader control of targeted pathogens.

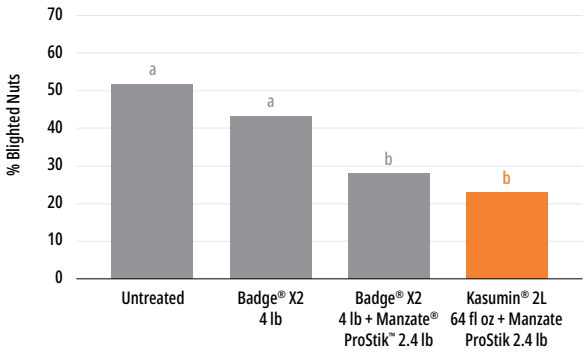
ROTATABLE & TANK-MIXABLE

KASUMIN is most effective when it is incorporated in a rotation program because the product shows no cross-resistance to other bactericides. For optimized disease control, KASUMIN can be tank-mixed with copper or MANZATE® PRO-STICK™ Fungicide (FRAC Class M3) from UPL. MANZATE has been used effectively for decades without a reported incidence of resistance, making it a standard in almost any disease management program.

TRUSTED IN WALNUT PRODUCTION

KASUMIN is already being successfully used in California walnut production for control of walnut blight, including copper-resistant strains, after receiving federal and state registrations in 2018. In more than five years of university and independent trials, KASUMIN, when mixed with MANZATE PRO-STICK from UPL, consistently performed better than the next leading walnut blight product.

KASUMIN EFFICACY ON WALNUT BLIGHT IN VINA WALNUTS



Dr. J.E. Adaskaveg, UCR, Fresno Co., CA – Walnut blight (Xanthomonas campestris)
5 weekly trt between 4/5 & 5/16 @ 100 gpa by tractor air-blast sprayer
Disease evaluation – June

NEXT UP: ALMOND PRODUCTION

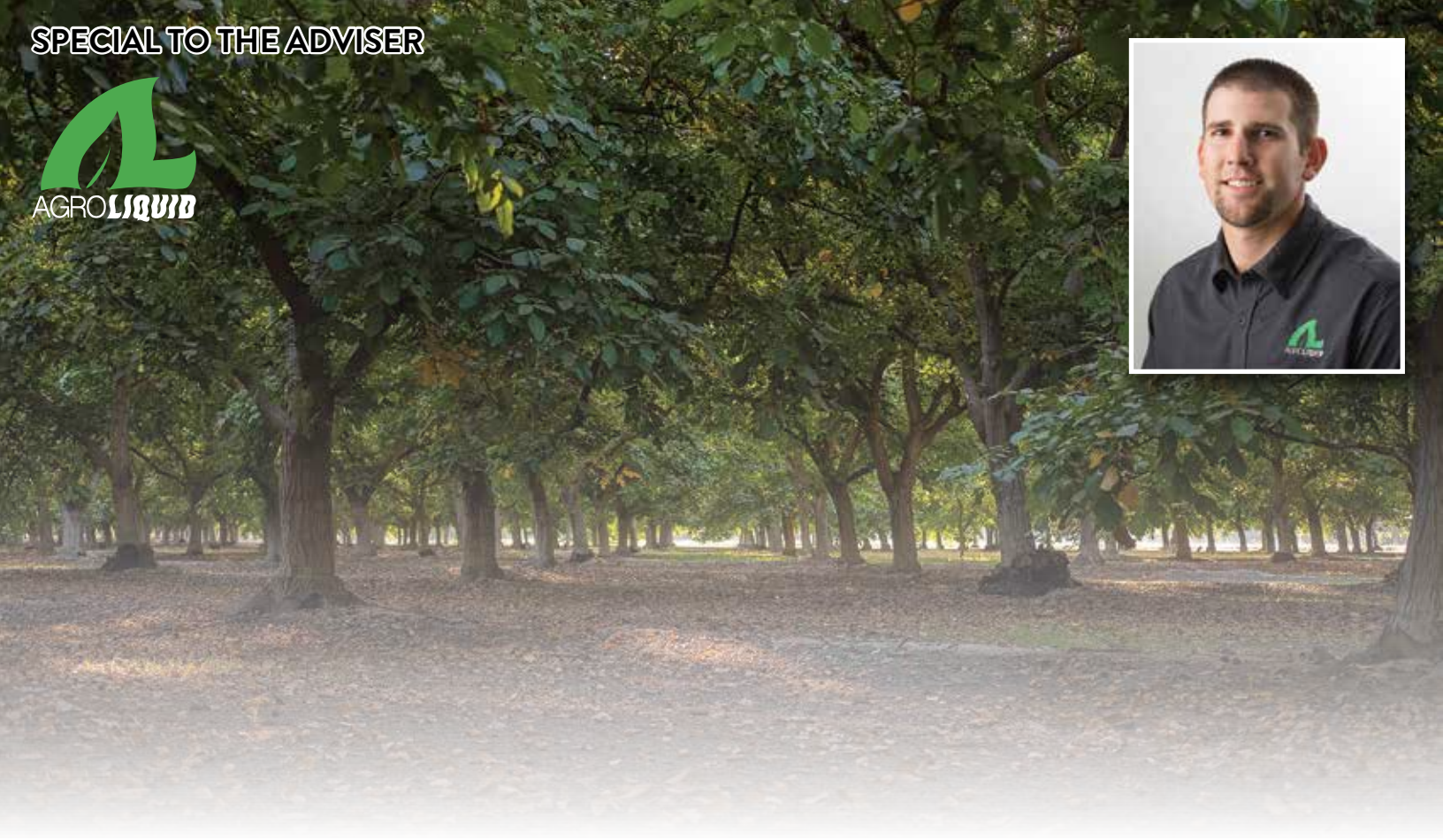
Earlier this year, the Environmental Protection Agency (EPA) and California Department of Pesticide Regulation (CDPR) granted and approved a Section 18 emergency exemption for use of KASUMIN on almonds for the control of bacterial blast. Approved for treatment on a maximum of 100,000 acres, the Section 18 exception offered reliable control for bacterial blast in 12 key almond-growing counties.

"There was considerable support for this use from the industry, including significant university backing as well as lobbying from the Almond Board of California and independent growers for the Section 18 exemption," says Davies. "We are very thankful for the opportunity to provide many California almond growers and PCAs with a highly effective tool for controlling bacterial blast in the 2020 season and look forward to what the upcoming season will bring."

UPL offers an integrated portfolio of agricultural products for specialty crops, including biological, crop protection and post-harvest solutions. For more information on KASUMIN and other UPL solutions, visit upl-ltd.com/us or contact your local sales representative.

UPL OpenAg™

SPECIAL TO THE ADVISER



Postharvest Fertility

By Dylan Rogers, Sales Account Manager

By this time of year, it is easy to fall into the mindset that the finish line for yet another growing season is near. Unfortunately, that is not the case. In fact, the most important part of the growing season is still upon us. Postharvest fertility can be the most crucial aspect of growing trees and vines. Having a solid postharvest game plan plays a critical role in ensuring better yields and quality for next season's crop.

After the stress of harvest, nitrogen, phosphorous, and potassium will begin to transition from leaves to spurs in almonds, and from leaves to roots and woody tissues in vines. In almonds, bud initiation and differentiation has already begun, so the fate of the 2021 crop is already underway. When dormancy breaks in early spring, trees and vines will be functioning solely on stored nutrients. Nutrient uptake from the soil is very minimal at this point due to cool soil temperatures as well as the lack of leaves. Adequate postharvest fertility to replenish nutrient reserves will ensure that your crop has the energy it needs to maximize production when dormancy breaks come spring.

Nitrogen (N)
Up to 20% of the total seasonal demand for nitrogen in almonds can be applied postharvest. This is similar for grapes. Postharvest nitrogen will help maintain leaf area and extend the time for photosynthesis to keep producing carbohydrates in the trees and vines. Postharvest N will also ensure that reserves are replenished and early shoot growth and leaf out will be strong in the spring. It is important to take in-season tissue samples into consideration when determining how much nitrogen to apply. Any soil-applied nitrogen in the nitrate form that is not taken up by the roots will be subject to leaching from rainfall and irrigations. Foliar-applied nitrogen is also a good choice for postharvest applications. It is common to use a fast acting nitrogen source in this situation, such as urea-based products.

Phosphorous (P)
The amount of phosphorous used by trees and vines is much less compared to the demand for nitrogen and potassium. However, this does not mean it is less important for optimal growth and yields. A postharvest application of phosphorous will promote healthy fall and spring root flushes, as well as ensure the trees and vines have a good energy source when dormancy breaks in the spring. Choosing a phosphorous fertilizer that is protected from tie up from cations in the soil is important and will ensure that it is free and available for the plant to uptake as needed.

Potassium (K)
Potassium demand in almonds and grapes is even higher than that of nitrogen. A postharvest application of potassium is essential in order to restore reserves, even more so if your yields were above

average this season. Potassium is an important aspect in plant water relations and cell reproduction. If potassium reserves are deficient when dormancy breaks in the spring, new fruiting spurs will develop at a slower pace or even die prematurely as compared to a tree that has optimal potassium reserves. Root uptake is minimal at this point, so a soil application of potassium will serve to replenish K reserves in the soil. A postharvest foliar application of potassium is a great way to ensure you get the potassium into the trees and vines to replenish those reserves. Choosing a K product that is free of chlorides and hydroxides, as well as effective at penetrating the leaf cuticle and easily translocated once in the leaf will provide the greatest return on your fertilizer investment.

Zinc (Zn)
Zinc is a very important micronutrient that plays a major role in synthesizing auxins. These auxins ensure a uniform bud break and a good fruit set in the spring. Almonds are commonly zinc deficient. This is due to a number of reasons, including certain rootstocks that are not adequate at taking up zinc from the soil. Zinc deficiencies are also common in areas with alkaline soils. Zinc is fairly immobile in the soil so postharvest foliar applications are most effective at correcting deficiencies and restoring reserves.

Boron (B)
Collecting hull samples to send off for boron analysis should be a staple in your postharvest game plan. Hull samples are the most effective indicator of boron levels in almonds. Boron is very critical for development of flowers, specifically pollen development and viability. If the hull analysis shows less than 80 parts per million boron, the trees are deficient and are most likely losing yield potential. Postharvest foliar applications of boron are an effective way to correct deficiencies and restore boron levels in the tree.

As this year's harvest concludes, let your mind shift gears and begin thinking about next year's crop. Its fate is already underway and having a solid postharvest fertility game plan will ensure your trees and vines go into dormancy with adequate nutrient reserves and your crop will be off to a great start come spring.

Trapping protocols for South American palm weevil in California

Ivan Milosavljević, Christina D. Hoddle, and Mark S. Hoddle, Department of Entomology, University of California, Riverside

South American palm weevil (SAPW), *Rhynchophorus palmarum* (L.) (Coleoptera: Curculionidae), is an invasive pest in California (CA) (**Fig. 1**). Native to parts of Mexico, Central and South America, and the Caribbean (Löhr 2013), this large black beetle, about 1.25 inches in length, was first detected in San Ysidro, in southern San Diego County CA, in 2011. Weevil populations likely established in or around San Ysidro in 2014 or earlier. Founding populations probably invaded San Diego County from Tijuana, Baja California, Mexico (~5 miles south of San Ysidro), where this beetle was first collected from infested Canary Islands date palms, *Phoenix canariensis*, in 2010. In addition to detections in San Ysidro, SAPW was trapped in Alamo, Texas in 2012 (USDA-APHIS 2012), and Yuma, Arizona in 2015 (USDA APHIS 2015). There are no reports of established populations of SAPW in Arizona and Texas or palm mortality caused by this weevil. Estimates suggest that SAPW has killed nearly ten thousand Canary Islands date palms in San Diego Co. (APC 2020).

Palm Mortality

Infestations of SAPW can kill palm trees in about 9 weeks once feeding damage becomes apparent. Feeding larvae cause irreversible damage to the apical meristem also known as palm heart (Giblin-Davis 2001). This relatively soft and fleshy growing material is found in the crown of the palm tree, and it is responsible for generating new fronds. Feeding in this region can lead to crown drop and palm death. Generally, a few months after initial infestation, palm trees decline and die from larval feeding damage. Damage symptoms include crown tilt and collapse, and significant loss of fronds that results in a halo of fronds attached to the top of the trunk (**Fig. 2**). The bases of dropped fronds are usually heavily tunneled indicating construction of pupal chambers within which pupating weevil larvae make cocoons from palm fibers. Occasionally, fibrous cocoons containing pupae or unemerged adults will drop to the ground beneath affected palms (**Fig. 3**).

The Economic Threat

SAPW presents significant threat to the ornamental and edible date palm industries in CA (Milosavljević et al. 2019). The urban landscape in CA is defined by palms, especially the ubiquitous Canary Islands date palm, and to a lesser extent, the edible date palm, *Phoenix dactylifera*, of which the latter is also known host for SAPW. The ornamental palm industry in CA is estimated at $70 million (US) per year. Canary Islands date palms have been valued at $500 (US) per 12 inch of trunk length and individual ornamental edible date palm costs around $5,000 (US). The risk SAPW presents to the edible date industry in Coachella Valley is substantial. The value of this crop is estimated at $100 million (US), growers produce approximately 47,000 tons of fruit grown on about 10,000 acres, and the industry employs around 6,000 people. In 2019 at Balboa Park in San Diego, the first confirmed report of SAPW killing *Brahea edulis*, the Guadalupe palm, native to Guadalupe Island in Mexico, was made.

Fig. 1. An adult male *Rhynchophorus palmarum*, the South American palm weevil.
Photo by Mike Lewis, Center of Invasive Species Research, University of California, Riverside

GROWING EFFICIENCY AND PROFITABILITY WITH IRRIGATION CHEMISTRY

Pests, diseases and limited access to irrigation water: Three challenges nearly every vineyard producer encounters. Over time, this trifecta can have a profound and expensive impact on an operation from reduced yield and grape quality to, in extreme cases, vineyard removal.

For Napa producer, Frank D'Ambrosio, this was the exact situation he faced. Season after season, D'Ambrosio Vineyards attempted to maintain a block of petit verdot limited by disease, phylloxera and nematodes, but to no avail. As part of a final effort to revive the underperforming section before removing it altogether, D'Ambrosio and Daniel Robledo, his viticulture consultant, initiated a trial on this block with an Irrigation Water Optimizer (IWO) from Precision Laboratories.

"The IWO is a water surfactant that helps the soil retain and expand water like a sphere around the root system. This also makes any nutrients applied through irrigation available to the plants much more easily," Robledo said.

Water and soil interactions depend on many different variables, such as soil type, particle size, porosity and organic matter. When those variables are insufficient, the availability of water is reduced and plant establishment, yield and crop quality can be hindered. This is where IWOs even the balance.

Daniel Robledo, PCA | Viticulturist

IWOs, a category of irrigation chemistry, help maximize plant health and the environment around the plant. Treating water with IWOs reduces surface tension, moving water into and throughout the root zone and decreasing runoff. By holding water in the root zone, IWOs not only optimize water usage, they also make soil-applied chemistries and nutrients more available to the plant. These efficiencies lead to better plant health, yield, crop quality and ROI.

ENHANCING THE VINEYARD AND THE BOTTOM LINE

Throughout the 2018 season, three applications of the IWO were made to the struggling petit verdot block. As the season progressed, D'Ambrosio and Robledo began to see significant improvement in the once unproductive block.

"When we started the trial, we had phylloxera and nematodes we were treating with a drip-applied insecticide," Robledo said. "The blocks that were treated with the IWO [in combination with the insecticide] now have zero phylloxera, and the nematode numbers dropped dramatically from 2018 to 2019. [It] is a powerful tool."

In addition to reduced pest populations, the trial yielded a 21% increase in wine grape weight, a 16% increase in production and a $6,300 per acre increase in ROI. Worth noting is that these enhancements in the vineyard and on the balance sheet were achieved even though irrigation of the block was reduced to three hours, twice a week.

"Five years ago, that vineyard had all kinds of problems," D'Ambrosio said. "Now, it's looking good."

"We're proud to provide a lineup of IWOs that help growers like D'Ambrosio Vineyards create a more ideal environment for the root systems of their plants for healthier, more productive crops and a more fruitful bottom line," said Dr. Rob Osburn, technical and commercial product manager. "At Precision Laboratories, we're always looking for new ways to improve producer profitability. IWOs are a great example of that commitment in action."

IRRIGATION WATER OPTIMIZERS

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Results. Expect it.

TO LEARN MORE ABOUT IRRIGATION WATER OPTIMIZERS, VISIT PRECISIONLAB.COM/IWO.

Fig. 2. Canary Islands date palms killed by SAPW in San Diego County. Photos by Mark Hoddle, Dept. of Entomology, UC, Riverside

Red Ring Nematode

The impact of SAPW on palms in CA may eventually be amplified by a palm-killing nematode, *Bursaphelenchus cocophilus*, commonly known as red ring nematode (RRN), the causative agent of red ring disease in palms. SAPW vectors RRN. Nematodes acquired by larvae render the weevils infectious, and movement of RRN from palm to palm is mainly by flying adults (Giblin-Davis 2001). Palms infected with RRN can die in 4 months after infection symptoms become noticeable. RRN has not been detected in SAPW captured in California and this nematode is not known from other locations in the USA either. However, RRN is known from parts of Mexico. As is the case with many invasive vector-pathogen systems in CA, the vector is detected first, then several years later, the pathogen is recorded (Milosavljević et al. 2017). A similar situation for SAPW-RRN may eventually develop in CA.

How Far can SAPW Fly?

The northern most urban areas in San Diego Co. infested with SAPW are a linear distance of approximately 80 miles from edible date production areas of the Coachella Valley. Adult SAPW are strong fliers and may be able to disperse naturally into date production areas from these infestation foci. In the lab, flight mill studies indicate that field-captured male and female weevils can fly on average 25 miles or more a day if they elect to do so (Hoddle et al. 2020). It is unknown if weevils undertake such long-distance flights in nature. However, flight mill studies indicate long distance flights are possible should weevils choose to do so, and this could occur in areas where there are no suitable hosts to attack. Field and lab studies indicate that SAPW flight activity is restricted primarily to daylight hours. Another way weevils can travel long distances is through accidental movement by humans when infested palms are moved into new areas (Milosavljević et al. 2019). Movement of live ornamental palms out of infested areas should be avoided to reduce the chances of unintended weevil introductions into new areas.

Which Traps to Use for Monitoring SAPW?

Incipient management programs for invasive SAPW continue to evolve in response to new infestations in CA. These programs rely upon trapping adult weevils in combination with insecticide applications which kill larvae and adults infesting palms, and removal and destruction of infested palms (Milosavljević et al. 2019). SAPW trapping utilizes either bucket traps hung from tree branches or staked to the ground or cone-shaped traps placed on the ground. All traps need to be loaded with commercially available SAPW aggregation pheromone and baited with fermenting bait (**Fig. 4**). Ethyl acetate can be used as a synergist to increase the combined attractiveness of the pheromone and bait. Details on building bucket traps, loading traps with aggregation pheromone, ethyl acetate synergist, and fermenting bait are available online (see Hoddle 2020). We recommend using cone traps over bucket traps for detecting and monitoring SAPW. In the field, cone traps were more effective than bucket traps for capturing and retaining SAPW (Milosavljević et al. 2020a). SAPW captures were five times greater in cone traps than in bucket traps that were suspended 1.5 m above the ground or placed on the ground. Cone traps captured almost 90% of SAPW that entered the trap (Milosavljević et al. 2020b). By contrast, of those weevils attracted to bucket traps, 89% entered, and of those entering traps, 82% escaped and only 18% that entered traps were retained and killed. Traps baited with the SAPW aggregation pheromone, ethyl acetate synergist, and dates with water or in combination with baker's yeast were superior to other tested baits (e.g., fermenting molasses solution) and traps loaded with pheromone only.

Suggestions for Effective Trap Deployment

Trap placement is important for detecting SAPW activity in an area of concern. Studies on red palm weevil in Europe have contributed to the following recommendations for trap placement for SAPW in California. Traps should not be hung from palm trees or placed

ADVERTORIAL

Left Jab, Right Jab, Block
Helping Almond Growers (Responsibly) Knock Out Pests

In 2018, the California almond industry launched four industry-wide goals – the Almond Orchard 2025 Goals – to help protect our right to farm, establish a journey towards continuous improvement and move towards the almond orchard of the future. One of those four goals is focused on increasing adoption of environmentally friendly pest management tools by 25%, using strategies beyond traditional methods to safely and effectively reduce pest levels.

That's where you come in: We need your help to manage pests more responsibly, and we want you to join our journey towards a better future.

What will this involve?

The Almond Board of California is helping the industry focus on an approach of proven cultural practices, alternatives to sprays (when possible), precision application and reduced spray drift. This approach will be applied to five key pest problems growers can combat and three initiatives growers can achieve using responsible integrated pest management (IPM) strategies. PCAs will play an integral role in advising growers on these measures and supporting their steps to grow their crop in better, safer and healthier ways.

Recommended Management Practices

Reduce Spray Drift

- calibrate equipment every year
- drive at a groundspeed of 3 mph or less in low-wind environment
- apply the lowest possible pressure necessary to provide uniform coverage
- use shields and drift guards
- consider inference spraying (requires the use of two spray rigs)

Promote Pollinator Health

Follow the Almond Board's Honey Bee Best Management Practices, available at Almonds.com/Pollination

General Efficacy

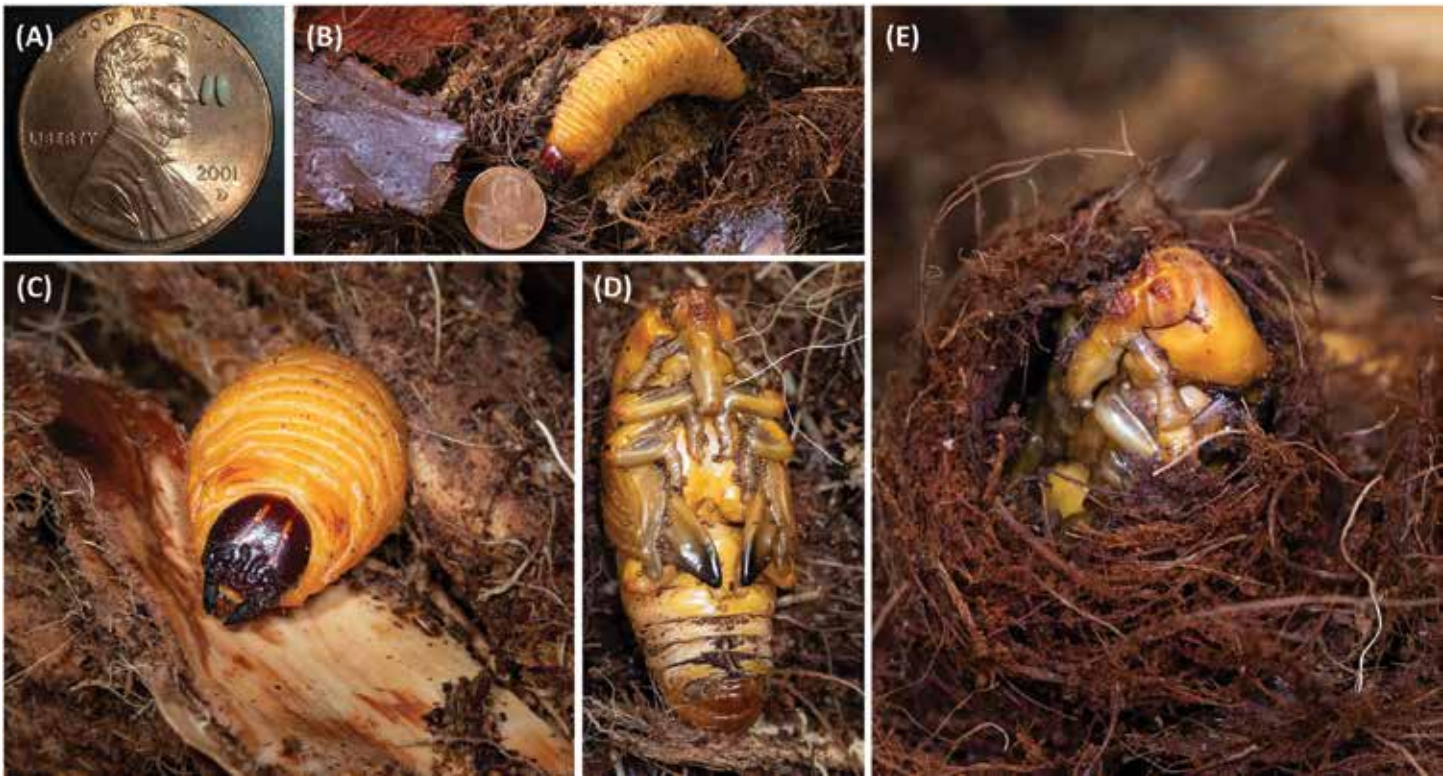
- use the lowest label rate
- avoid broad spectrum products and rotate applications when possible, to reduce resistance

Visit Almonds.com

to learn more about your vital role in helping the California almond industry achieve our 2025 Goal to increase environmentally responsible pest management.

california almonds
Almond Board of California

Fig. 3. Development stages of SAPW. (A) eggs, (B) feeding larva, (C) a larva extracted from an infested palm, and (D) pupa fully and (E) partially removed from cocoon. Photos by Mike Lewis, Center of Invasive Species Research, University of California, Riverside



near (i.e., within 500 yards) palms of interest. Traps are not 100% efficient in capturing weevils. If traps are placed too close to palms adults that are attracted to traps but are not retained in traps may start infestations in palms that are being monitored. If detecting low levels of palm weevil activity in the general vicinity is the goal of the monitoring program, traps should be deployed outside (perhaps > 0.5 mile away) of the immediate area of concern. If weevils are captured at this distance from the palms of concern it likely indicates that weevil activity is close by and steps should be promptly considered and implemented for protecting those palms. Trap efficacy is maximized if traps are placed in areas with partial or full shade. Full sun exposure, especially during the hottest parts of the day, rapidly diminishes trap potency. ■

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Fig. 4. (A) Picuan trap, (B) hanging bucket trap, dead weevils floating in antifreeze in, (C) a bucket trap, and (D) fermenting bait in a plastic container with a perforated lid sitting in the capture pan of bucket trap. Holes in the container are for release of fermentation volatiles. Photos by Ivan Milosavljević and Mark Hoddle, Dept. of Entomology, University of California, Riverside

Johnsongrass management in California:
New tools available for ID, management, and reporting

Image 1. Dense stand of Johnsongrass along roadside (A.R. Ceseski).

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Dense thickets of johnsongrass (*Sorghum halepense*) are a familiar summertime sight to anyone working in agriculture, or plying the highways and county roads of the Central Valley (Image 1). Originally from the Mediterranean region, johnsongrass is well suited to California's hot, dry summers and milder winters. Johnsongrass grows readily on roadsides and embankments, in ditches and field edges, on pastures, or in any disturbed areas. Johnsongrass grows rapidly and can handily outcompete other species, resulting in the all-too-familiar sight of long stretches of roadsides or canals dominated by johnsongrass alone.

Johnsongrass infestations in alfalfa, corn, sorghum, cotton, oilseed, and other summer row crops can significantly reduce yields. It is also a secondary host to viruses that affect sorghum, corn, and other grain crops or forages. Johnsongrass is a perennial, and propagates both by seed and underground rhizomes. Johnsongrass spread by rhizome is far more common; individual plants can produce up to 300 feet of rhizome a year if left unmanaged (Image 2). Machinery, livestock, or water most often facilitate the spread of Johnsongrass seed.

Young seedlings and rhizome sprouts can be difficult to distinguish from other grasses; they resemble corn seedlings, with first leaves nearly horizontal (Image 3). Rhizome sprouts can emerge when daytime temperatures reach 60°F, but seeds germinate later, when daytime temperatures are 70-75°F. Actively growing plants are bushy with long bright-green leaves that may have a fountain-like appearance (Image 4). Flowering typically begins in May, and may last until October. Mature johnsongrass is easily identified by its 6-8 foot stature and distinctive large-seeded, wide open pyramid-shaped panicles that range from orange to red to purple-brown in coloration (Image 5).

Which management options are recommended for johnsongrass, and which aren't, depend on how established an infestation is, and what time of year it is. Seedlings and rhizome sprouts are essentially indistinguishable (Image 3), so it is best to treat any newly detected johnsongrass plant as vanguard to invasion. Once established, Johnsongrass can spread quickly if not actively managed early on.

Johnsongrass seedlings and sprouts generally begin new rhizome development at the 5-6 leaf stage. Killing seedlings and actively managing sprouts prior to this stage is critical, to prevent the spread of infestation. Early in the season, young seedlings can be easily managed with herbicides, cultivation, grazing, or flaming. However, care must be taken to ensure that the plants are dead. Any escapes should be dealt with in a timely manner to prevent the development of rhizomes. With rhizome sprouts, it is recommended to use systemic nonselective or grass-specific herbicides while plants are small and growing vigorously, to make sure the existing rhizomes are

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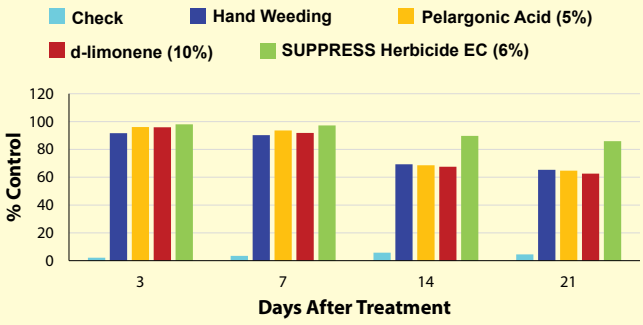

2017 Grower Trial: Weed Composition: Nettle (Urtica urens): 29%; Field bindweed (Convolvulus arvensis): 18%; Johnson grass (Sorghum halepense): 15%; Pigweed (Chenopodium album): 13%; Ryegrass (Lolium multiflorum): 12%; Common sowthistle (Sonchus oleraceus): 9%; Bull mallow (Malva nicaensis): 3%; Coniza bonariensis: 1%

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Image 2. Portion of a johnsongrass rhizome network (A.R. Ceseski).

Image 3. (L): Johnsongrass seedlings (J.M. DiTomaso). (R): Rhizome sprout (A.R. Ceseski).

injured as well as aboveground tissue. Regrowth from rhizome stores will likely occur, so it will be necessary to hit the infestation again with herbicides or mowing.

Large, established johnsongrass infestations are time-consuming and expensive to manage, and difficult to eradicate. Early in the season it is best to use herbicides on actively growing plants first, if that option is available. Regrowth can then be managed with more herbicides or mowing. Managing mature plants is also possible with a mowing followed by repeated mowing or herbicides on the active regrowth. Large infestations will generally require multiple rounds of mowing and / or herbicide applications per season to deplete carbohydrate stores, prevent seed-set, and minimize new rhizome growth. However, diligence in this practice can reduce infestations by a large margin, year over year. Other cultural control methods tend to be less useful on established infestations, and can even be harmful. In these cases, pulling, tillage, or cultivation may fragment and redistribute rhizomes, potentially spreading the infestation.

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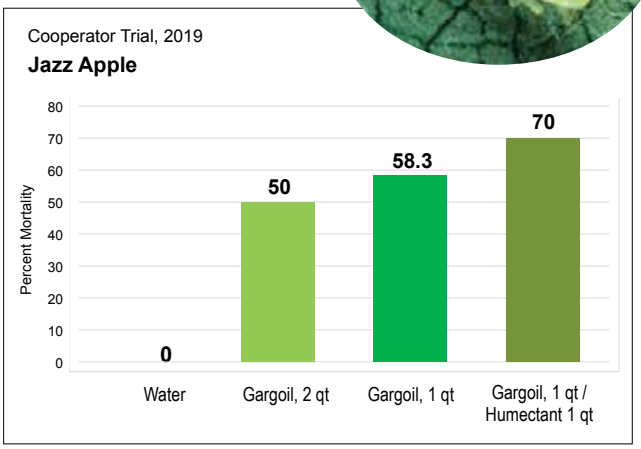
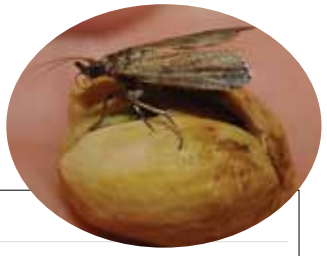
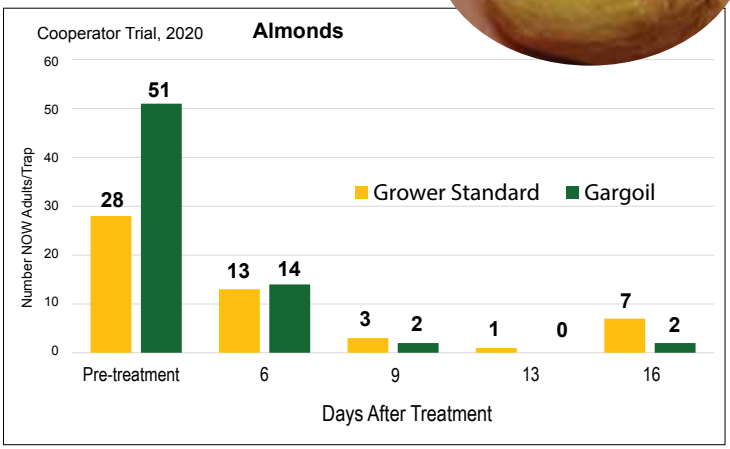


Infested leaves or shoots were sprayed to runoff with a hand sprayer. After 24 hours, sprayed samples were examined and evaluated microscopically for mortality.

Gargoil® Controls Navel Orange Worm Adults





Grower Standard was Bt plus Burkholderia Strain A396. Gargoil was applied at 3 qts/150 gallons of water per acre. All products were applied at the start of hull split.

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Image 4. Mature johnsongrass plant, note fountain-like leaf habit (J.M. DiTomaso).

Image 5. Johnsongrass panicle detail, with emerging panicles in background (A.R. Ceseski).

Image 6. Example of JohnsonGrass-JG app user interface (M.B. Mesgaran).

Though johnsongrass is especially aggressive, and managing infestations is complex and effort-intensive, there are resources available to aid in identification and management. There are two recent UCANR bulletins on johnsongrass identification (https://anrcatalog.ucanr.edu/pdf/8570.pdf) and on johnsongrass management (https://anrcatalog.ucanr.edu/pdf/8569.pdf) that are available to download for free. Online picture galleries and management information are also available at http://ipm.ucanr.edu/PMG/WEEDS/johnsongrass.html and https://www2.ipm.ucanr.edu/agriculture/, respectively.

There is also a newly developed app called JohnsonGrass-JG. The app is available for Apple or Android mobile devices by searching "johnsongrass" in either format's app store (Image 6). The app contains the information found in the two abovementioned UCANR bulletins, as well as an option to record a newly-found infestation, to aid in tracking the spread of the species. Navigability of the app is intuitive, and the file information is available offline, though recording new infestations will require internet access to upload.

Johnsongrass can be an especially noxious pest, and difficult to control. Though we may never eradicate johnsongrass from the state, local infestations can be managed effectively through smart management practices, which can make the difference between under-control and out-of-control. The resources mentioned in this article can help growers and PCAs with decision making and reporting, which can mitigate the spread of johnsongrass in California. ■

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Cucumber beetle management in fresh-market melons

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Margaret Lloyd, Small Farms Advisor, UCCE Capital Corridor

Figure 1. Western striped and western spotted cucumber beetles feeding on a pumpkin seedling. *Photo: Marja Koivunen.*

Figure 2. Western striped cucumber beetle and scarring damage on a honeydew melon. *Photo: I. Grettenberger.*

The western striped cucumber beetle (*Acalymma trivittatum*, henceforth "striped CB") and the western spotted cucumber beetle (*Diabrotica undecimpunctata undecimpunctata*, "spotted CB") are serious pests of fresh-market muskmelons in the Sacramento Valley and northern San Joaquin Valley (Fig. 1). Pressure from cucumber beetles in cucurbits has been especially severe the past several years. The most problematic damage is by adult striped CB. They feed on the bottom surface of fruit and scar the rind, creating cosmetic damage and unmarketable fruit, especially for smooth-skinned varieties like honeydew (Fig. 2). They are difficult to control with pesticides later in the season because they hide underneath fruit. Melon is their preferred host and they have three generations per year. Spotted CB beetles feed on foliage, flowers and fruit of cucurbits and produce less rind damage, but can cause stand losses in seedling fields. Pressure from striped CB has been severe at times during the past few years in muskmelons, although cucumber beetles have been an ongoing issue in both organic and conventional production systems.

Melon fields are regularly scouted for cucumber beetles and conventional management relies on insecticides, commonly neonicotinoids and pyrethroids. Current management consists of insecticide sprays when beetles are detected in the field. Applications are repeated as needed throughout the season to avoid crop injury, which may be once a month, or weekly in high-pressure years. Pest managers use stringent thresholds in conventional fields, and insecticides are applied when one striped CB or ~five spotted CB are found. In years where markets are saturated, melons with scarring damage larger than a quarter are not marketable, but these guidelines can relax if melons are in short supply.

Cucumber beetles are also major pests for organic cucurbit producers. Insecticide options are minimal, but include spinosad, pyrethrins, kaolin clay and diatomaceous earth. However, some can have detrimental effects on natural enemies that help manage other pests. Cultural methods like row covers can work, but require extensive investments of time and money. Avoidance by varying planting date can also be an option.

To address issues managing cucumber beetles, our research focuses on developing tools to better monitor and manage cucumber beetles in melons.

Figure 3. Non-crop area adjacent to a field to be planted with cucurbits at an organic farm in the Sacramento Valley. Photo: Jasmin Ramirez Bonilla.

Descriptive non-crop habitat surveys

Striped CB appear to overwinter as adults in close proximity to melon fields, although what drives habitat choice is unknown. Spotted CB overwinter in other crops (e.g., alfalfa) and adults migrate into melons in the springtime. Anecdotal evidence suggests striped CB shelter underneath protective structures like tree bark and leaf litter in the winter. They become active as early as

mid-February when temperatures rise above ~ 53 °F and remain in non-crop areas until cucurbit hosts are planted. These areas could be targeted for monitoring or managing these beetles prior to or immediately after cucurbit plantings.

To better understand overwintering habitat of striped CB, we monitored non-crop areas at two organic farms in the Sacramento Valley with mixed cucurbit operations in early spring 2020 (Fig. 3). Samples were taken weekly at each farm using yellow sticky cards with a floral lure, sweep net sampling, and visual counts. Weed assessment (by percent cover) was documented to associate weed species with beetle abundance from visual counts.

With all of our sampling methods, striped CB were active when no melons were planted in fields (Fig. 4). We found substantially more beetles at Farm #1 and more beetles on non-crop plants during visual counts, so we focus here on that farm. Across dates, we found striped CB on a subset of the weed species (Fig. 5; other species present as well). There did appear to be a strong preference for broadleaf weeds over grasses. We did find striped CB most frequently on little mallow and milk thistle, but these were also the most abundant weeds at sites at Farm #1 that had many striped CB. None of the weed species appeared to be especially attractive to striped CB, although we did find the most striped CB at locations with more of these weeds. There were a number of weed species at the farms we monitored, but it is likely other areas have different suites of weeds.

Figure 4. Weekly counts of striped CB using three monitoring methods. Counts were summed across the eight locations at each farm.

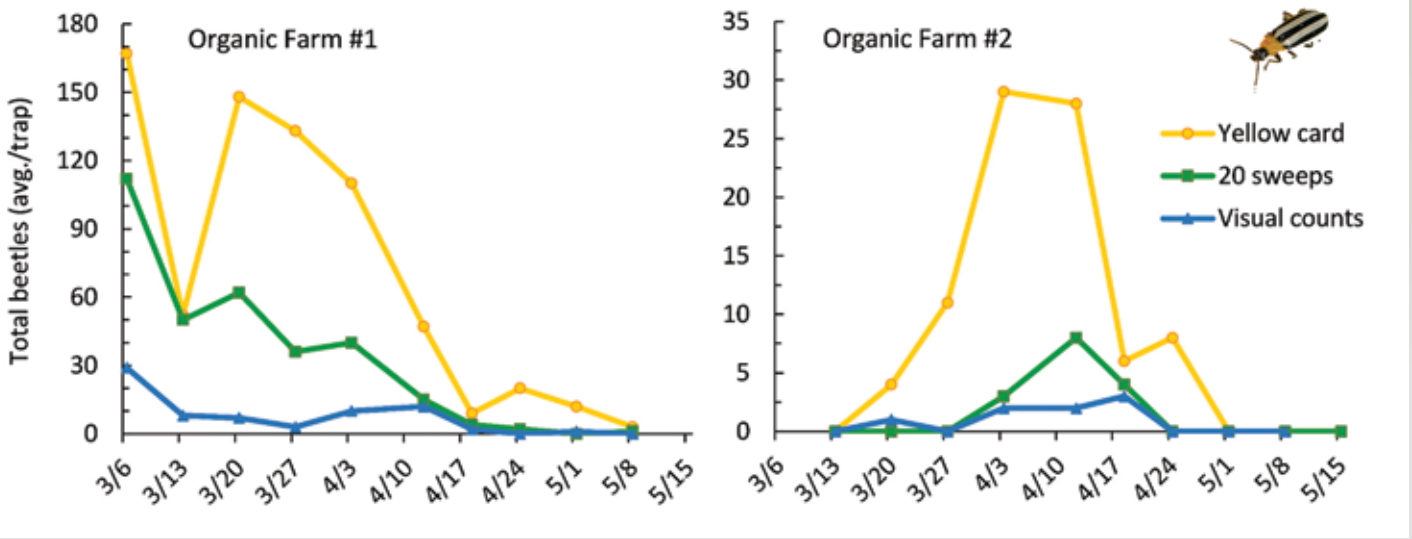

Figure 5. Number of striped CB observed on specific weeds (and off plants) at each sampling date per trap location at Farm #1. Off plants* used to record beetles observed flying or on the soil.

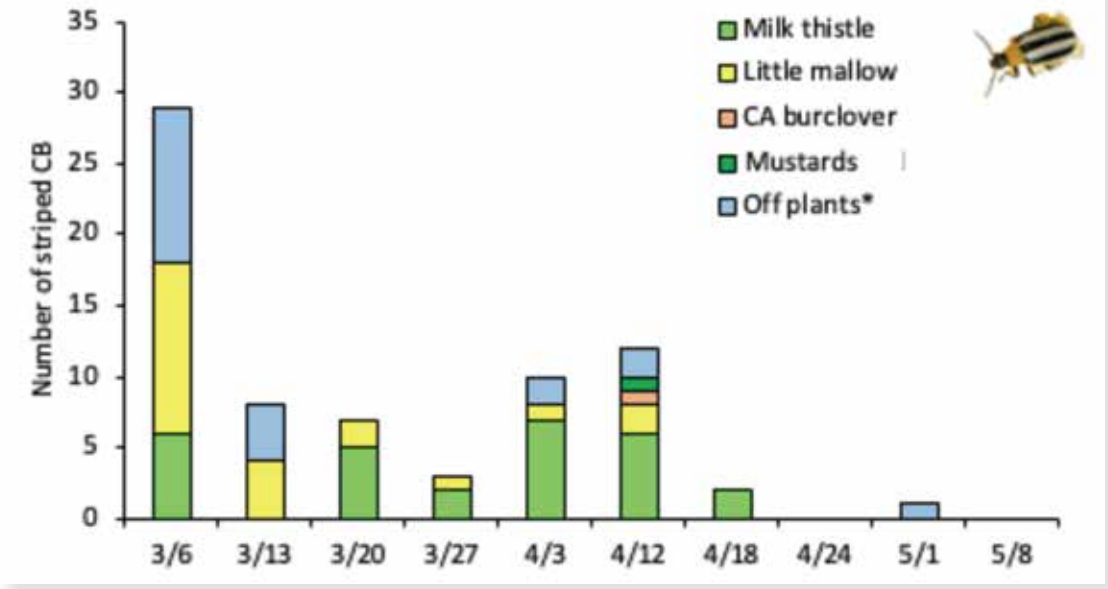

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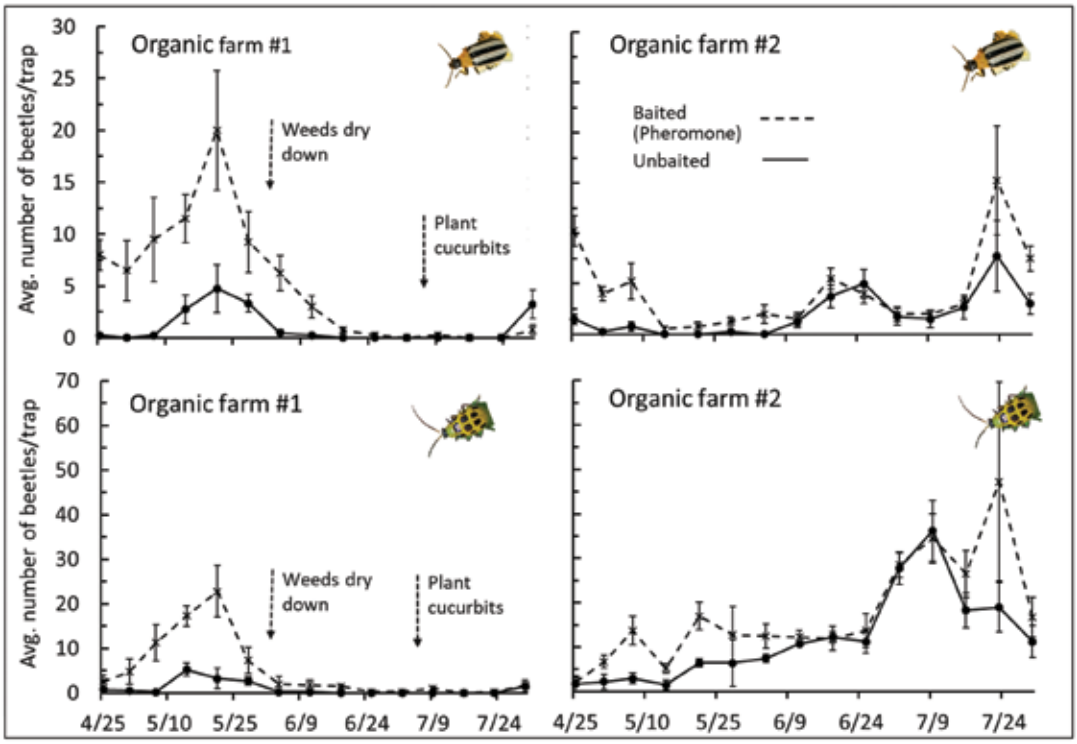
Figure 6. Average numbers of striped CB and spotted CB caught per treatment over time at Farm #1 and #2.



Pheromone trial

The cucumber beetle aggregation pheromone, vittatalactone, has been identified for the related eastern striped cucumber beetle species, and USDA ARS has commissioned a pilot batch for field testing for both the eastern and western species. This pheromone is emitted by males, attracts both males and females, and can be used to enhance trap captures. In addition, the pheromone has been found to attract the (eastern) spotted cucumber beetle. We are currently evaluating the efficacy and attractiveness of vittatalactone for western cucumber beetle species at two organic farms in the Sacramento Valley with mixed cucurbit operations. This field trial focused on two treatments: clear sticky trap either baited with vittatalactone or unbaited.

Preliminary results indicate that pheromone-baited traps capture higher numbers of both striped and spotted cucumber beetles than unbaited traps throughout the season (Fig. 6). The decrease in captures from June to late July at Farm #1 may be due to the absence of planted cucurbits; summer squash was planted in early July. Beetles likely dispersed away from non-crop habitat once weeds senesced and dispersed back into fields later. Another trial from the end of the 2019 season also indicated the pheromone is attractive. This study indicates the pheromone could improve monitoring efforts for both western cucumber beetle species. Furthermore, it could serve as a component of an attract-and-kill tactic targeting beetles early in the season, before cucurbits are planted.

Insecticide Trial

Methods

We conducted an insecticide trial in fresh-market melons in 2019. We chose treatments commonly used commercially and two organic treatments (Table 1). Honeydew (Tam Dew) was direct-seeded on 60-inch beds on June 19 at a UC Davis research farm with 20 × 25-ft plots and four replicates per treatment.

Once beetles were readily observed, we applied treatments using a backpack CO_2 sprayer (July 22). We treated plots again on August 15 and September 5. Our spray schedule was not aggressively timed. On "off" weeks for applications, applications of only kaolin clay were made weekly to the two treatments that included clay. We counted beetles in plots for 4 minutes 3, 7, 10, 14, and 21 days after the first application (DAT). They were also counted 4, 14, and 19 DAT2 and 4, 7, 11, and 14 DAT3. We assessed damage by scoring 12-20 melons (ideally 20, but limited in some plots) on size of scarring injury. We assessed damage on a scale of 0-3 based on severity of damage (Fig. 7). Melons with cucumber beetle feeding scars larger than the size of quarter coin were considered a cull (rating: 1-3). This was based on conversations with PCAs working with conventionally grown melons. Damage was primarily on the bottom of the melons and was likely due largely to feeding by striped CB.

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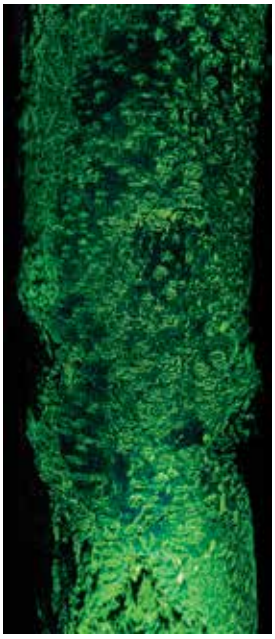

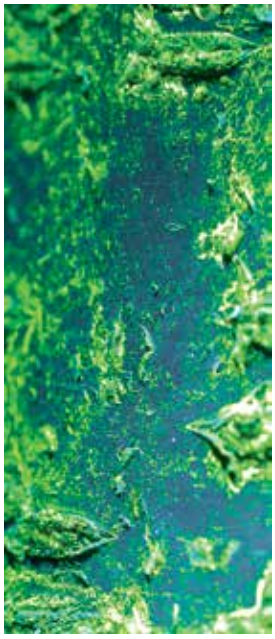

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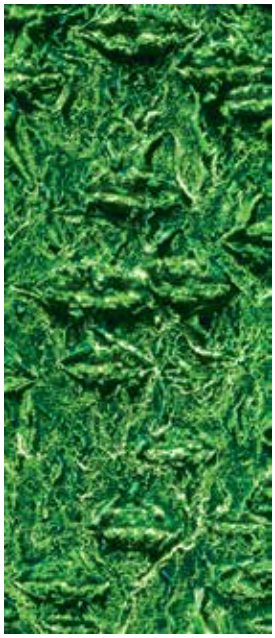

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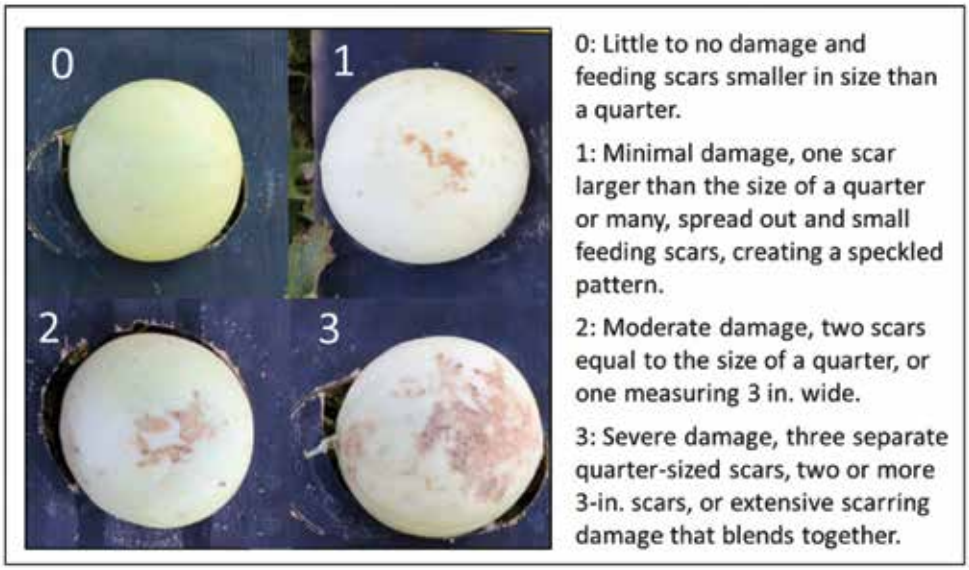
Table 1. Treatments used in the insecticide trial.

Trt#	Insecticide	MOA	Rates (per acre unless otherwise noted)
1	Untreated check	--	
2	Acetamiprid	4A	2.3 oz
3	Bifenthrin	3A	8.5 fl oz
4	Bifenthrin + imidacloprid	3A+4A	6 fl oz
5	Carbaryl	1A	32 fl oz
6	Kaolin clay + spinosad + gustatory stimulant (Organic 1)	5	25 lbs + 10 fl oz + 3 oz
7	Kaolin clay + diatomaceous earth (Organic 2)	--	25 lbs + 40lbs
Treatment 6 was applied at 87 GPA			
Treatment 7 was applied at 300 GPA, except for applications of only kaolin clay, which were made at 87 GPA			

Figure 7. Damage scores used to assess cucumber beetle damage at harvest.



Results

Populations were low at the beginning of the season. There was no beetle pressure at the seedling stage, so we cannot comment on efficacy at this stage. We will focus on performance of the treatments when viewed across the course of the study (summed counts).

For striped CB, plots sprayed with carbaryl or acetamiprid had the fewest beetles (Fig. 8). The untreated and both organic treatments had the highest numbers of striped CB. Patterns were generally similar for spotted CB (Fig. 8). The untreated and organic treatment plots all had the highest spotted CB populations over the course of the study. Plots with the fewest spotted CB were those with applications of acetamiprid or bifenthrin.

As seen in Fig. 9, there were differences in patterns of damage between treatments. The acetamiprid treatment, along with the premix of bifenthrin and imidacloprid, were most successful at protecting melons from cucumber beetle feeding and preventing culls. These treatments kept culls (based on a stringent damage threshold) below 20%. Bifenthrin and carbaryl plots had greater cull percentages, but they were not statistically different from the treatments that were most effective. We tested several other unregistered conventional insecticides in the trial, but results are not reported here. While some held promise for managing cucumber beetles in melons, future work will need to follow up on these results.

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A TREE'S ROOTS ARE THE FOUNDATION TO SUCCESSFUL PRODUCTION. They provide stabilization, nutrients, water, and oxygen. Without these attributes plant systems simply could not function. So why as a crop protection industry do we focus so much so much on the crop destructors within the branches of a tree rather than the crop constructors at the foundation. As agronomist we need to focus on crop production before we start to worry about crop protection.

A tree's root system faces various obstacles to maintaining an effective gateway for production inputs. A crop advisor once made the statement "Why does an almond grower have to wait for his trees to blow over to realize he has *Phytopthora*, when in fact every tree in the orchard is probably infected in some degree", and to build upon that a noted pathologist offered "And what root hair isn't in a constant battle with *Pythium*". To what degree are your orchards infected ?

K-PHITE 7LP Systemic Fungicide/Bactericide is the only linear polymer phosphite registered in California for the control of both *Phytopthora* and *Pythium*, but also *Fusarium* and *Rhizoctonia* as well. All four of these pathogens comprise the compendium referred to "Root Rot". In the absence or control of these pathogens the tree is able to respond in what is referred to as a "Root Flush", a period of accelerated root growth making the overall plant more efficient and capable of translocating greater water and nutrients, resulting in superior yields. The problem with these pathogens are that they are ever-present in the soil profile. A "yield driven" agronomist should recommend **K-PHITE 7LP** three times throughout the year for continued control of "Root Rot"; early leaf, late spring, and early fall to ensure a healthy, vibrant, and responsive root system. With the systemic flexibility that **K-PHITE 7LP** provides, treatments may be applied as foliar or chemigation with equivalent results. For the response you want, use a reliable, responsible, and registered product. Maximize your root health, use the one and only **K-PHITE 7LP** on every tree.

KPHITE 7LP
SYSTEMIC FUNGICIDE BACTERICIDE

PLANT FOOD SYSTEMS, INC.—ZELLWOOD, FL., the nation's premier acidulator of potassium hydroxide offers California an advancement in the manufacturing of potassium phosphite, **K-PHITE 7LP Systemic Fungicide Bactericide.** Registered on Almonds, Avocados, Citrus, Grapes, Pistachios, and Walnuts along with many other crops, **K-PHITE 7LP** exhibits multiple efficacies that include *Armillaria, Botryosphaeria*, *Botrytis cinerea,* Powdery Mildew, Downey Mildew, *Sclerotinia*, *Pseudomonas* and *Xanthamonas.*






For more information including research results and scientific publications, contact;

Mark Brady, Western Marketing Manager, Plant Food Systems, Inc.

(559) 731-1267 mbrady@plantfoodsystems.com

Figure 8. Summed counts across dates of striped and spotted cucumber beetles for various insecticides treatments. ** = treatments/materials not registered for melons in CA. Values are means ±SE. Means for each species that are not significantly different share the same letter.

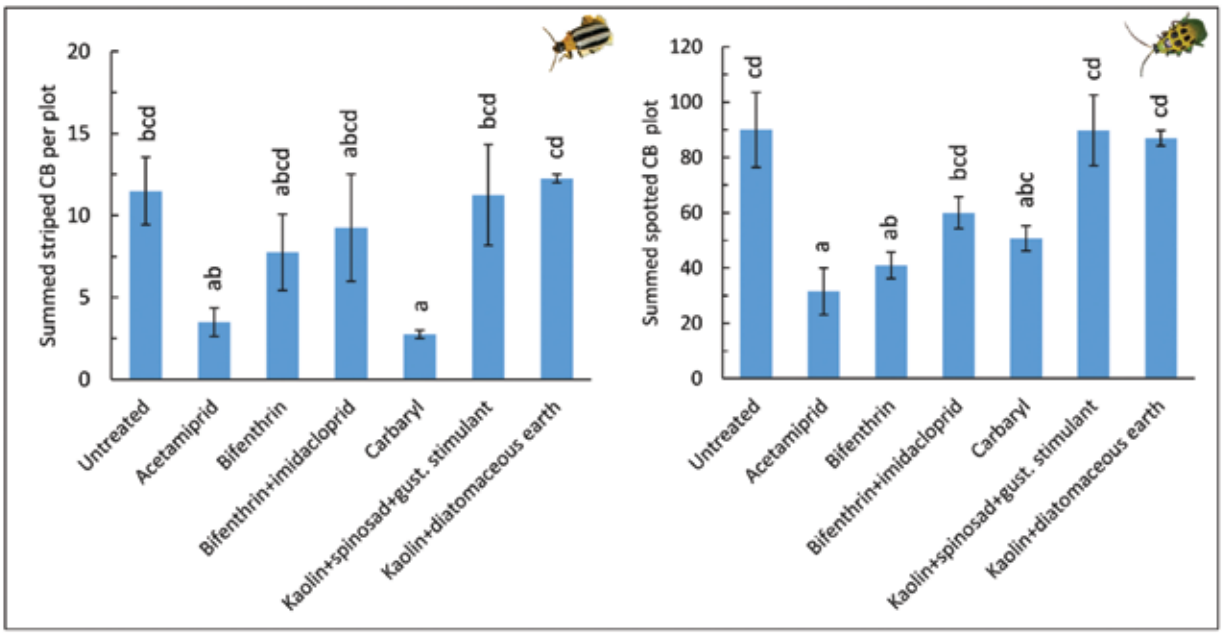
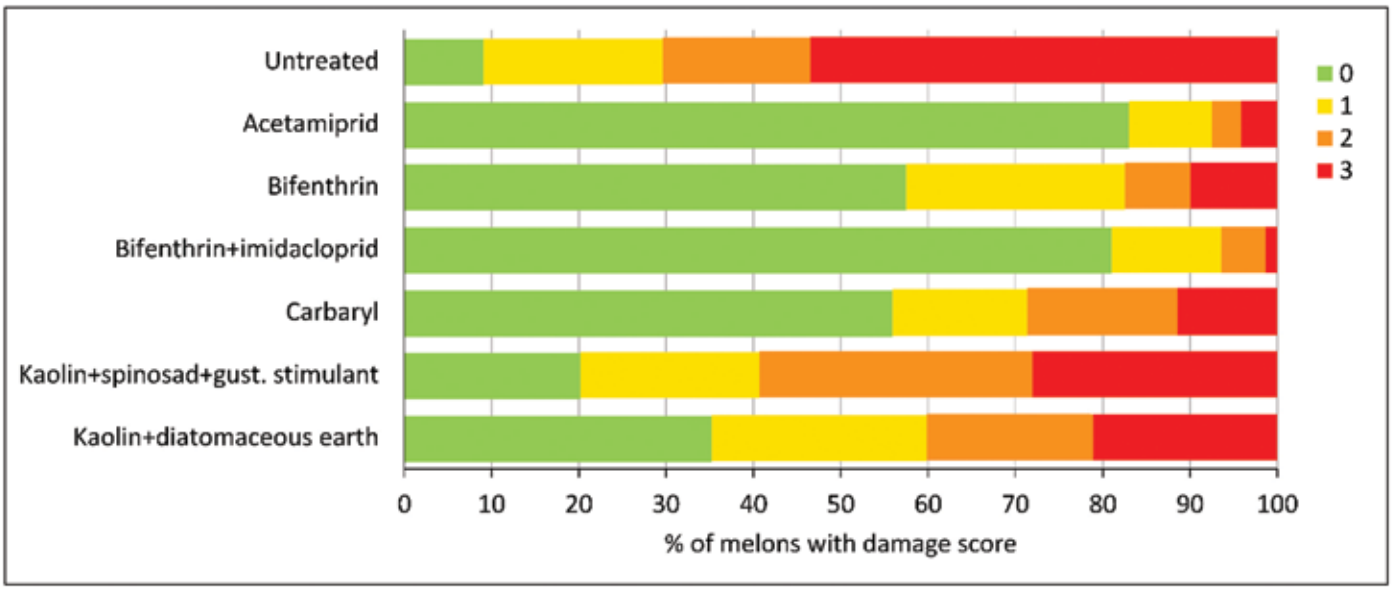


Figure 9. Damage assessment from the melon damage scoring using the damage scores defined in Fig. 7.



The organic treatments did not statistically reduce culls compared to the untreated. They also did not differ statistically from the untreated for the most extreme damage categories (2-3). There was an interesting trend research needs to follow up on, in which the kaolin clay + diatomaceous earth treatment had 65% culls vs. 91% in the untreated and 40% of melons in the most extreme damage categories compared to 70%. It is worth noting that the market for organic melons has different standards when it comes to cucumber beetle feeding damage.

Conclusions

Cucumber beetles likely will remain problematic pests due to the low thresholds for damage in conventional systems, their at-times high populations, and current availability of tools in organic production. In the long-term, we hope that improved IPM practices, including monitoring and targeted management, will help prevent and suppress damage by these pests. ■

ADVERTORIAL

CONSISTENT, EXCELLENT EFFICACY FOR SPIDER MITE PRESSURE

Spider mites continue to impact specialty crop growers' production in California and throughout the nation, requiring growers to implement effective strategies for fluctuating pest populations throughout the growing seasons. Orchards are particular susceptible to mite flare-ups and require an integrated pest management plan that provides consistent control strategies throughout the growing seasons.

To effectively manage spider mite populations, growers must also maintain healthy levels of beneficial insects to maximize effectiveness of integrated pest management programs. Choosing a unique insecticide/miticide formulation that is gentle on beneficial insects is essential to the ongoing control of harmful mite populations in specialty crops and orchards.

Abamectin-based miticides, such as Abacus® V by Rotam, work primarily through ingestion to break down the insect's central nervous system, which disrupts neural and neuromuscular transmission, leading to paralysis and death of spider mites. Abacus V exhibits translaminar movement within the leaf that is sprayed. Once the formulation has moved into the plant's leaf tissue, it is then ingested by feeding mites. Environmentally friendly Abamectin breaks down quickly in the soil and at the soil surface, while microbial degradation occurs in dark conditions.

ABACUS® V: CONTROL DAMAGING MITES WITH MINIMAL IMPACT ON BENEFICIALS

Early applications of Abamectin-based miticides, such as Abacus V, provide excellent early season control of mites and other damaging insects that attack tree nut and specialty crops. Abacus V should be your first choice in strategic implementation of season-long mite control. Rotam understands that growers need high quality, innovative solutions that provide excellent crop safety.

- Abacus V from Rotam is a proven, low VOC liquid insecticide and miticide containing 2% Abamectin
- Thorough leaf coverage is essential for the best control when applying Abacus V
- Tank-mix compatible with a wide range of supplemental products
- For best results, application is recommended once the first instance of mites are observed on plant surfaces
- Tested for phytotoxicity, with a wide margin of safety on a variety of crops.
- Flexible range of pre-harvest intervals. Refer to the product label for relevant PHI's
- Flexible and compatible for resistance management programs
- Minimal impact on beneficial insects for maximum broad-spectrum control

KEY CROPS

- Grapes
- Almonds
- Fruiting vegetable crops
- Leafy vegetables
- Tree nuts
- Apples
- And many more

KEY PESTS CONTROLLED

- Two-spotted spider mite
- Strawberry spider mite
- Pacific spider mite
- Carmine spider mite
- And many more

ABACUS® V

MITICIDE/INSECTICIDE with ABAMECTIN

SPECIAL TERMS AND CONDITIONS
This article is not intended as a substitute for the product label for the product(s) referenced herein. Always read and follow label directions and precautions for use. Product(s) referenced herein may not be registered in all states. Confirm your state's registration status with a Rotam representative.

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ROTAM

An introduction to Bacillus thuringiensis bioinsecticides

Mike Dimock, Ph.D./ Vice President, Field Development/ Certis USA, L.L.C.

Bt: The first commercial bioinsecticide

Discovered at the turn of the 20th century in Japan and formally named soon afterward in Germany, the bacterium *Bacillus thuringiensis* (Bt) has been used as a bioinsecticide since the 1930s. Bt was first introduced to the US market in 1958 as Thuricide®, a still in commercial use and manufactured in California from the start. Since then, Bt products have become dependable tools for managing caterpillar pests in agriculture, forestry, floriculture, and home gardens, as well as in public health for control of mosquitoes and blackflies. The unique mode of action, natural origin, and robust safety profile of Bt provide growers flexibility in producing high quality crops while avoiding some of the challenges associated with synthetic chemical insecticides.

How does Bt work?

Late in its life cycle, during spore formation, a Bt cell produces insecticidal proteins known as delta-endotoxins, or Cry toxins because they form crystals within the cells. Bt spray products contain spores, crystals, cell debris, and other components of the harvested fermentation biomass (Fig. 1).

Upon ingestion of Bt spray deposits by a susceptible insect larva, the crystals dissolve in the alkaline environment of the midgut, releasing protoxin molecules which are converted to activated delta-endotoxins by the insect's own digestive enzymes. Activated toxins attach to highly specific receptor proteins on the surface of the cells lining the insect gut, then insert themselves into the cell membrane to open pores (Fig. 2). The resulting "ulcers" cause gut paralysis and stop insect feeding in as little as 30 minutes. Death usually follows within 1-3 days from starvation, osmotic shock, or septicemia as gut contents, including spores, leak into the bloodstream (hemocoel) and affect other vital functions.

Laboratory bioassays with purified Cry toxins have found that caterpillars species differ in toxin susceptibility. Some species, such as cabbage looper, peach twig borer, and leafrollers, are quite susceptible to most Cry toxins, making them relatively easy to control with Bt sprays compared to others (most notably armyworms in the genus *Spodoptera*) that are less susceptible. Larval age and size also play a role in toxin susceptibility, with small larvae (1st and 2nd instars) requiring lower doses than mature larvae.

What kinds of Bt products are available, and what are the target insects?

There are many subspecies and strains of Bt, from which more than 700 unique Cry toxins have been identified to date. These are classified into 73 families (Cry1 - Cry73) and numerous sub-families (Cry1A, Cry1B, Cry1C, etc.) and smaller units (Cry1Aa, Cry1Ab, Cry1Ac, etc.) based on similarity of amino acid sequence. Most commercial Bt spray products targeting caterpillar pests (Lepidoptera larvae) contain *B.t.* subspecies *kurstaki* (Btk) or *aizawai* (Bta) and their associated Cry1 and Cry2 toxins. Other Bt subspecies are found in products effective against larvae of Diptera (mosquitoes, blackflies, fungus gnats) and Coleoptera (some leaf beetles and grubs).

Btk and Bta strains differ in the types and amounts of Cry toxins they produce, and insects vary in susceptibility to individual Cry toxins. Cry toxins present in commercial Bt spray products and susceptibility of representative Lepidoptera species are indicated in Table 1. Products based on Btk are characterized by the presence of Cry1A and Cry2A toxins. In addition to Cry1A and Cry1D toxins, Bta is characterized by presence of Cry1C which is lacking from natural Btk. Cry1C is more toxic than others to *Spodoptera*

Figure 1. Vegetative growth, sporulation, and toxin crystal formation in *Bacillus thuringiensis*.

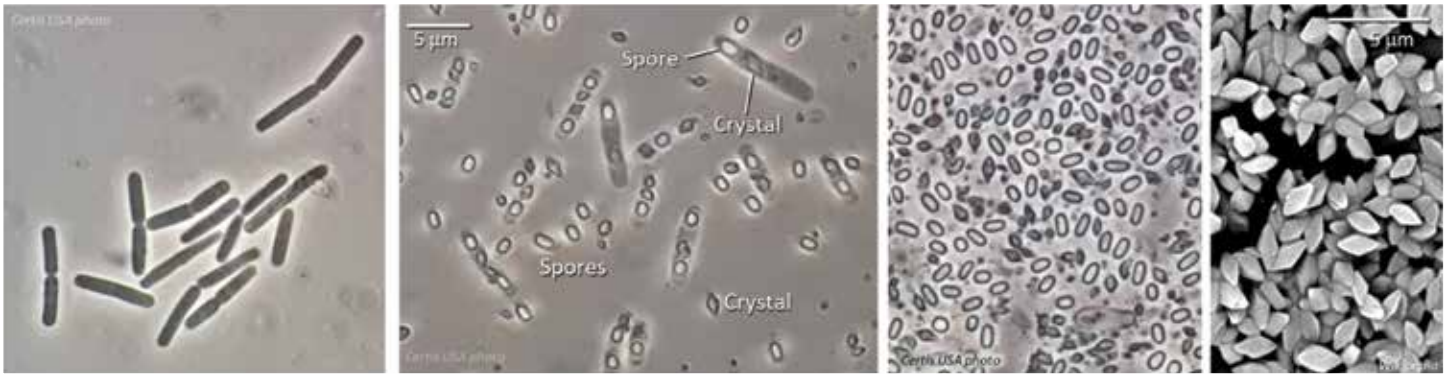
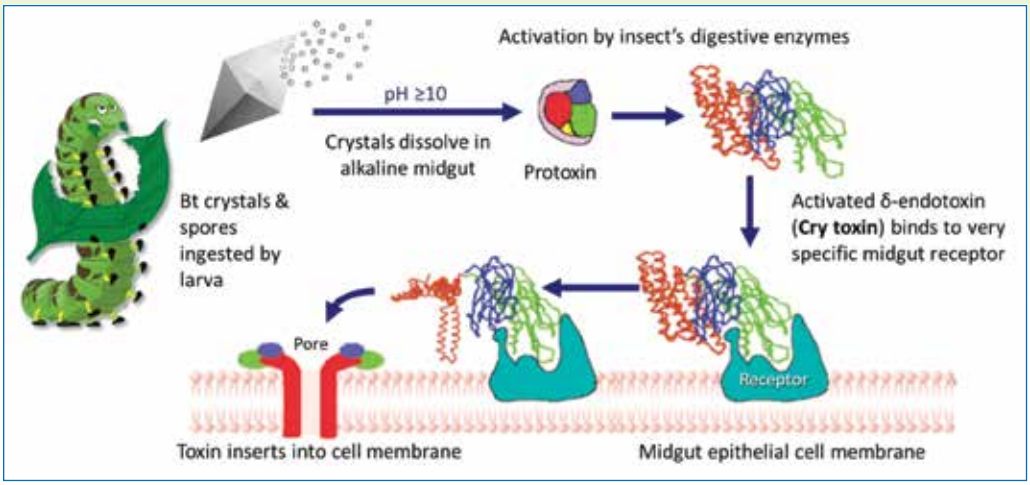


Figure 2. Mode of action of *Bacillus thuringiensis* against Lepidoptera larvae. Diagram modified from R. deMaagd et al. (2001), TRENDS in Genetics Vol.17 No.4.



species (armyworms), which are relatively insensitive to Cry1A toxins and therefore less susceptible to Btk.

What are some features of Bt that make it valuable for IPM?

Bt has characteristics that make it a valuable tool for integrated pest management, and most Bt spray products are also approved for use in organic crop production. The highly specific mode of action of Btk and Bta is limited to Lepidoptera larvae, with no toxicity toward beneficial insects (including bees), humans, livestock, or wildlife. Of course, this also means that Bt spray products will not control non-susceptible pests such as aphids or spider mites. But Bt sprays also will not flare secondary outbreaks of those pests by harming their predators and parasitoids.
Most Bt products are exempt from US-EPA residue tolerance requirements, with no preharvest interval (PHI), or maximum residue limits (MRL) for exported commodities. Coupled with minimal re-entry interval (4-hour REI), Bt provides flexibility in crop and harvest management compared to pesticides requiring longer waiting periods before field re-entry and harvest.

Bt sprays tend to have short residual activity because of the effect of solar UV radiation on proteins. This contributes to the lack of residues, but may necessitate reapplication, especially in periods of rapid plant growth or sustained egg-laying by the target pest species. Residual activity can be extended by spraying late in the day (larvae continue to feed and ingest Bt at night) or tank mixing with a commercial sunscreen adjuvant. The proteinaceous nature of Bt gives it some natural rainfastness if spray deposits are allowed to dry on the plant for several hours. Most Bt spray products used in agriculture are dry formulations (water-dispersible granules or wettable powders) stable for 2-3 years at room temperature if kept dry in the original packaging. Refer to product labels for specific instructions on handling, storage, and use.

What is the role of Bt in insecticide resistance management?

The unique mode of action (IRAC Group 11) shows no cross-resistance with other insecticide chemistries, making Bt a good rotation or tank mix partner for insecticide resistance management. As with any insecticide, prolonged reliance on frequent Bt sprays (or repeated exposure to transgenic crops expressing Bt toxins) may result in development of resistance to one or more of the Cry toxins present in the product. However, research has shown that different Cry toxin families bind with different receptors in the insect midgut. Rotating Btk and Bta products can be a useful tactic for managing the risk of resistance, but as with all pesticides, overreliance on any single mode of action should be avoided.

What is the future of Bt in agriculture?

Since the mid-1990's, genes coding for Bt toxins have been transferred into plants to develop transgenic crops resistant to rootworms, bollworms, borers, and other insect pests. New Bt strains are still being discovered, and new proteins are still being characterized from non-commercial Bt strains. Some of these have shown activity against insects not targeted by current Bt sprays, such as plant bugs, thrips, mites, ticks, and nematodes. Even human cancer cells have been found to be susceptible to certain Bt toxins. New types of Bt toxin proteins have been engineered into transgenic plants to prevent or delay resistance to the Cry toxins also expressed in these plants. And researchers continue to investigate in finer molecular and genetic detail the process of receptor binding and basis of toxin specificity.

Despite more than a century of research and commercial development, Bt has not yet given up all its secrets. Not bad for an active ingredient that has been in commercial use since before most of today's PCAs were born! ■

Table 1. Cry toxin profile of *Bacillus thuringiensis* spray products (upper table) and susceptibility of Lepidoptera species to those Cry toxins (lower table).

Cry toxin family:	Cry1A	Cry1C	Cry1D	Cry2A
Presence (+) or absence (-) in commercial Bt products based on different subspecies				
B.t. subspecies *kurstaki* (Btk)	+	-	-	+
B.t. subspecies *aizawai* (Bta)	+	+	+	-
Relative susceptibility of representative target insects				
Cabbage looper (*Trichoplusia ni*)	+	+	-	+
Diamondback moth (*Plutella xylostella*)	+	+	+	-
Corn earworm* (*Helicoverpa zea*)	+	-	-	+
Beet armyworm (*Spodoptera exigua*)	+/-	+	+	+

*Also known as tomato fruitworm and cotton bollworm.

ONLINE CONTINUING EDUCATION OPPORTUNITIES from CAPCA

https://capca.com/onlinece

CAPCA's mission is to serve as a leader in the industry and continue to provide quality education. In a changing world, that mission and our service to members hasn't changed. Monthly subscriptions for our online CE are available now.

At this time DPR has not amended their renewal deadlines or requirements, and we don't expect that to change. CAPCA advises members and licensees to plan to renew with the correct number of hours on the timeline set out by DPR: submit your renewal packet by November 1st to obtain your license by January 1st of 2021; all CE hours for those renewing in 2020 must be earned by December 31st of this year.

Field Worker Safety Training

1.0 DPR (1.0 Laws)

Field Worker Safety Training is an interactive, click-driven course that includes some video segments. This course primarily focuses on the requirements of a fieldworker training course that would meet compliance with the California Code of Regulations. The course is designed for licensees with the content suited best for Categories D and O.

This course was developed in partnership with the Riverside County Ag Department. CAPCA would like to thank County Ag Commissioner Ruben Arroyo and his staff for helping transition this outreach to an online course.

CAPCA Spring Online CE

2.0 DPR (0.5 Laws, 0.5 Aerial, 1.0 Other)

A three-part video series featuring speakers from CAPCA's 2019 Annual Conference. Sessions are 15 minutes, 30 minutes and 38 minutes, each followed by a quiz. (Please note: at this time, once begun, a session cannot be paused or returned to without losing progress.)

Turfgrass & Aquatics IPM

2.0 DPR (2.0 Other)

This course is a two-part presentation from landscape specialist Pete Gumas, covering detailed weed identification in landscapes and turf, as well as pesticide and IPM controls for summer weeds; and from aquatic specialist Eli Kersh with Alligare discussing the environmental factors that cause pests in aquatic sites and IPM principles for managing aquatic sites, including control methods.

Our thanks to Mr. Kersh and Mr. Gumas for supporting quality education for CAPCA Members.

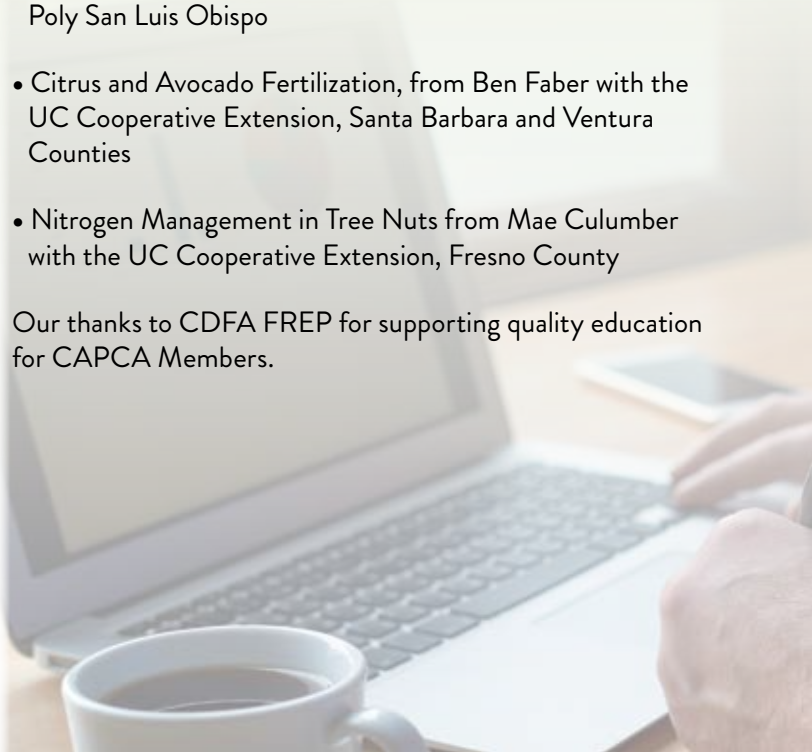
FREP & CAPCA Nitrogen Management Update

CCA-only hours: 1.0 NM & 1.0 SW

This three-part series includes the following presentations:

- Fertigation Maintenance and Troubleshooting from Franklin Gaudi, with Irrigation Training and Research Center, Cal Poly San Luis Obispo
- Citrus and Avocado Fertilization, from Ben Faber with the UC Cooperative Extension, Santa Barbara and Ventura Counties
- Nitrogen Management in Tree Nuts from Mae Culumber with the UC Cooperative Extension, Fresno County

Our thanks to CDFA FREP for supporting quality education for CAPCA Members.



Laws and Regs Update

1.0 DPR (1.0 Laws)

Riverside Agricultural Commissioner Ruben Arroyo provides a statewide update on Agriculture and Pesticide concerns of Ag Commissioners: latest Active Ingredient issues such as 1,3-D mitigation, neonicotinoids and bee notification; PPE alternatives, 2ee reminders and agriculture/pesticide concerns for the Southern California Region.

We thank Mr. Arroyo for his time and willingness to provide education to CAPCA Members.

Paraquat Dichloride Toxicity, Label Changes, and Closed System Requirements

1.0 DPR (1.0 Laws)

Paraquat Dichloride: Toxicity, Label Changes, and Closed System Requirements is an interactive, click-driven course that includes some video segments. This course primarily focuses on understanding the toxicity of paraquat-dichloride, label changes and closed system requirements.

This course was developed in partnership with the Kings County. CAPCA would like to thank Mario Gutierrez, Elvis Martinez and Jimmy Hook for helping transition this outreach to an online course. Thank you to our course sponsor Syngenta for supporting the publication of this education. ■

Check

https://capca.com/onlinece/

for new content as it becomes available

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 NOVEMBER

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

RENEW APPLICATORS FIRST

For pest control businesses, the qualified applicator must be renewed before the business license can be renewed.

If you do not receive your application, please contact the licensing program at LicenseMail@cdpr.ca.gov or download a blank application at: www.cdpr.ca.gov/docs/license/lictypes.htm

California Environmental Protection Agency
dpr Department of Pesticide Regulation

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CAPCA

CAPCA 2021 Sustaining Membership Levels

BENEFITS	BRONZE	SILVER	GOLD	CHROME	DIAMOND	PLATINUM
	$600	$2,000	$3,000	$5,000	$10,000	$25,000
Sustaining Member Acknowledgement on the CAPCA website and in each issue of the *Adviser*	✔	✔	✔	✔	✔	✔
Subscription(s) to *Adviser* Magazine	1	1	1	1	2	2
Job Opportunities Posting in *Adviser*	1	2	Unlimited	Unlimited	Unlimited	Unlimited
½ Page *Adviser* Ad (October issue excluded)		✔				
One-Page Ad in *Adviser*					1	3
Adviser Advertorial*			1	1**	1**	1**
Complimentary Mailing Labels		1	2	2	3	5
Comp Conference Registration(s)***			1	2	2	3
Priority Reservation for Conference Exhibit Booth***				✔	✔	✔
CAPCA Online CE Host or Collaboration Discount			$250	$500	$500	$750

* October issue fills quickly, first come, first served

** October issue guaranteed if booked by April 2021

*** Pending the availability of hosting In-Person events in 2021. Due to still unknown/potential space limitations or gathering restrictions, CAPCA reserves the right to limit one booth per sustaining member. In the event of a virtual CAPCA Conference in 2021, CAPCA will prioritize sustaining members in placement. Comp Conference Registrations will apply to virtual pricing.

To submit your Sustaining Membership form for 2021
visit www.capca.com/sustaining-membership

CAPCA

BUMPER CROPS demand season-long nutrition.

After harvest, almond trees can be depleted of the nutrients they need to stay healthy and ensure consistent yields. A heavy crop year removes more nutrients from the system than a light crop year. This fall, deliver high-quality, field-proven Protassium+® SOP and ProAcqua® Elevate to replenish essential nutrition.

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- Molybdenum supports nitrogen use efficiency and stress mitigation
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Recommended application timing: post harvest with nitrogen, via irrigation

*Not listed on the product label in all states.

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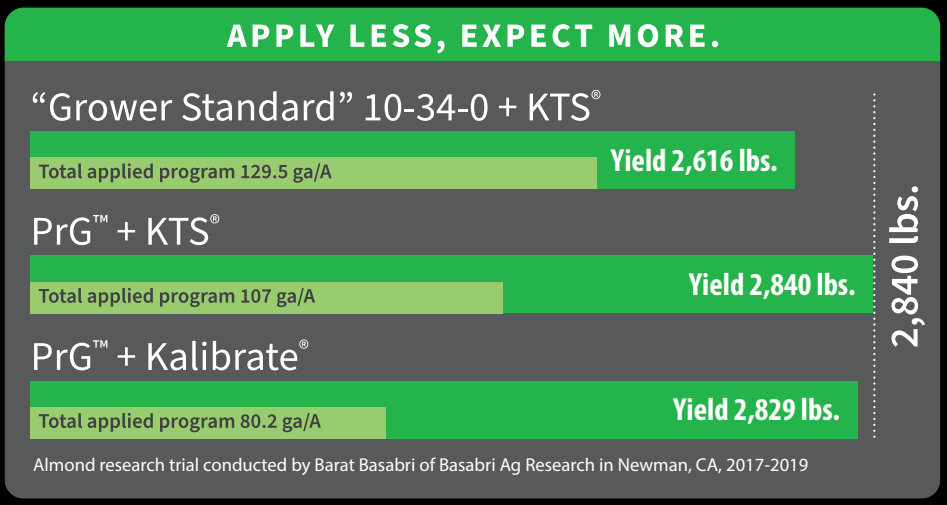
A quality crop demands quality nutrition?

PRECISELY.

With over 2.4 million acres of trees planted, California grows over 85% of the world's almonds. Virtually all commercially harvested almonds produced in the U.S. come from California. Most of that is due to the climate: warm, dry summers and cool, rainy winters are key to setting the tree up for success. But, we know it takes more than a temperate climate to maximize a crop's potential. AgroLiquid crop nutrition can be a valuable tool in producing an abundant and quality almond crop. In an effort to determine the best sources, rates, timings and methods of application for this important crop, AgroLiquid is on the third year of a full-scale research trial in almonds in California.

AgroLiquid has long believed in proving our technology through rigorous research and field testing. In western soils, we are looking at our technology performance compared to conventional fertilizer sources. Almonds are the perfect crop to test our Flavonol Polymer Technology, given how much potassium is needed to produce a crop. AgroLiquid's proprietary technology allows us to chelate/encapsulate nutrients within the sweet spot—not too loose, but not too tight. Our multi-year almond trial has been conducted by Barat Basabri of Basabri Ag Research in Newman, CA.

APPLY LESS, EXPECT MORE.



Almond research trial conducted by Barat Basabri of Basabri Ag Research in Newman, CA, 2017-2019

Kalibrate® Precision Potassium
Soluble Potash
with Flavonol Polymer Technology (FPT)

Trial details: Each plot consists of five trees and was replicated six times across the orchard. Throughout the growing season, 50 gallons per acre (ga/A) of UAN-32 is applied as a constant in every plot and EDTA Zinc (Zn) applied four times during the season for a total of 2 ga/A.

Yield results in the three plots were statistically insignificant, meaning yields were comparable despite the substantial differences in application rates.

Using AgroLiquid products with Flavonol Polymer Technology, growers are able to use less fertilizer in gallons compared to conventional treatments and achieve equal to better results in yield and quality. The Flavonol Polymer also allows for unmatched tank mix compatibility, all AgroLiquid products are able to be mixed together and will stay in suspension without "fallout." AgroLiquid products can even be mixed with most with most conventional fertilizers to help aid with every crop's nutrient needs.

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Better fruit and nuts start here

DECEMBER 07-11, 2020

THE CONFERENCE IS FREE TO ATTEND

VISIT ALMONDCONFERENCE.COM
FOR MORE INFORMATION

JOIN THE JOURNEY

THE ALMOND CONFERENCE

GOES VIRTUAL TO ALLOW MAXIMUM GLOBAL PARTICIPATION:

This virtual experience will offer events for growers, handlers, and industry partners running throughout the week. The agenda will include educational sessions, social gatherings, an exhibit hall, and poster sessions, as in the past. The virtual setting also will present new opportunities for attendees, exhibitors and sponsors, including the flexibility to participate in an educational session in the morning, work in the orchard in the afternoon, and attend networking events throughout the day.

20/20

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Almond Board of California

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Crop protection and crop health solutions for growers.

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Every aspect of this job is a challenge just waiting to be overcome. Crop protection included.

Working in farming means you're better than most at overcoming obstacles. You got that way through practice – lots of it. But every grower needs support. Atticus provides it with branded-generic herbicides, fungicides and insecticides you can count on, backing them up with the expertise you need for victory. Because success relies on every possible edge. Find yours at AtticusLLC.com.

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CAPCA

Dedicated to Supporting PCAs

MISSION & PURPOSE

CAPCA's mission is to facilitate the success of the PCA and to represent our 3,000 members who provide pest management consultation for the production of food, fiber and ornamental industries of California.

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

CAPCA is dedicated to the professional development and enhancement of our members' education and stewardship which includes legislative, regulatory, continuing education and public outreach.

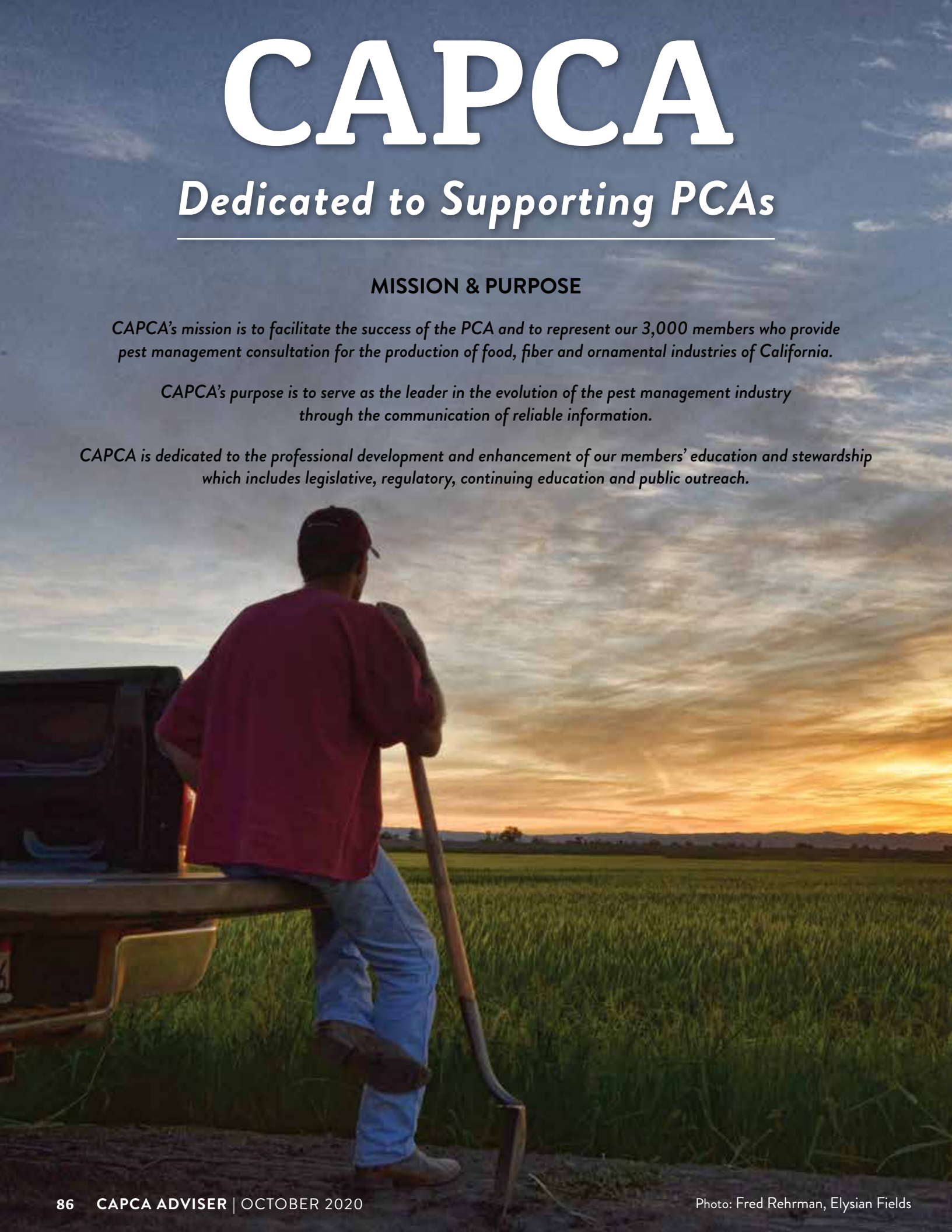

Photo: Fred Rehrman, Elysian Fields

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The most powerful MRL-exempt slug and snail baits—period.




Slugs and snails simply can't resist Ferroxx AQ® and Sluggo Maxx® slug and snail baits. Their highly palatable Micro-pellets® deliver the **iron phosphate formulation** to the maximum number of baiting points.

Their broad labels cover a wide variety of agricultural and turf/ornamental crops. They're effective in ground and aerial applications and can be used around pets and wildlife. An unlimited number of treatments are allowed each year, with no retreatment interval.

FERROXX AQ® SLUG AND SNAIL BAIT

- Has superior activity in wet and cool weather
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- Broadcast applications unrestricted

SLUGGO MAXX® BRAND

OMRI LISTED® For Organic Use

- The most powerful slug and snail bait for organic agriculture with **3X the iron**
- Water resistant
- OMRI Listed®

Ferroxx AQ or Sluggo Maxx.

Make your choice. Then, Bait Back!

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NOTE: Some of the following job opportunities are abbreviated postings. To view the complete posting, please log into your membership access on our website at https://capca.com/my-account/

Sales Representative – Southern California

JH Biotech, Inc.

Description: This position works directly with growers and distributors to sell agricultural chemicals, fertilizers, and biological products. Plan and implement sales and marketing plans for the assigned territory. Must be knowledgeable in vegetable, fruit, nut, and grape crops plus have experience working in a farm environment. Candidate must be able to stay 2-8 nights away from home per month. Local resident preferred. Bilingual is helpful, but not required. Territories include Southern California (south of Hwy 80 to the Mexico border) and Arizona.

Qualifications/Requirements: Position requires a B.S. degree in an agricultural-related field such as agronomy, soil science, crop production, agricultural business, or horticulture. Current PCA license required. Position pays salary in addition to commissions. Salary DOE.

Apply: Please send resume and cover letter to JH Biotech, Inc., Human Resources Department
Fax: (805) 650-8942 / Mail address: P.O. Box 3538, Ventura, CA 93006 / Email: hr@jhbiotech.com

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Project Manager-Sugarbeet IPM Research - Imperial Valley

Univ. of California, Davis and UC ANR

Description: The primary focus of this project is to identify less-toxic substitutes for chlorpyrifos in sugarbeet production in the Imperial Valley, and improved IPM practices for insect control generally. The Project manager will help implement and manage experiments at the UC DREC and in growers' fields, collect and help analyze data, work with growers and PCAs, report results.

Qualifications/Requirements: A bachelors or higher degree (preferred) in applied entomology or pest management. Some experience or familiarity with commercial crop production is desirable. See the job application website for a complete list of desired qualifications.

Apply: Look for position: SRA 2 NEX (Staff Research Associate)-9402 on the UC Davis website https://www.ucdavis.edu/jobs/staff

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Account Manager, Specialty Markets – California

Precision Laboratories

Description: The outside Account Manager, Specialty Markets will be responsible for supporting the company's sales activity with assigned customers in California (must reside in CA).

Qualification/Requirements: Achieve sales and strategic product goals based on key company initiatives. Build and implement customer business plans. Conduct product training with customers and identified growers. Identify and conduct field demonstrations to grow product and category awareness.

Apply: Email resume to cstevens@precisionlab.com or apply online at www.precisionlab.com/careers

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Field Product Development Specialist - Dinuba, CA

Nutrient Technologies Inc.

Description: Nutrient Technologies Inc, a member of De Sangosse Group (https://www.desangosse.fr), is seeking an experienced Field Scientist to be based in Central California to expand our product line through the development and integration of products and technology in support of commercial efforts. In this role, the individual will develop, plan, evaluate and report field and greenhouse trials.

Qualifications/Requirements: MS degree in Plant Science or related field AND a minimum of 3 years technical services or field development experience in the ag fertility/biologicals industry having significant experience with high value specialty crops. Effective oral and written English communications skills. Excellent interpersonal, customer service and presentation skills. Able to work both independently and with a team. Demonstrate time management skills a must. CCA license or eligible. Ability to travel domestically variably up to 25%.

Apply: Closing date 11/01/2020. Send letter of interest and resume to: jobs@techflo.com

GAR Bennett
WE HELP GROWERS FEED THE WORLD

ARE YOU AN EXPERIENCED PCA?

Come work with the best in the industry.

GAR Bennett Offers:

- Competitive compensation package includes: transparent bonus plan, 401K, profit sharing, comprehensive benefits plan (health, vision, dental, life and disability insurance).
- We deliver the right product, to the right place, at the right time.
- Expert irrigation and agronomy teams help produce results.
- Get your customer a price, place your order and delivered all in the same day.
- Expanded fleet of dry and liquid equipment is calibrated and quality inspected to meet grower needs.
- Talk to "The Boss" directly and get answers right away.
- Aggressive marketing team to ensure you are supported with brand recognition in your market area.
- The Gar & Esther Tootelian Foundation promotes agricultural awareness and education through community foundations and supporting students with scholarships and donations.

BUCK HEDMAN

"Making a move for GAR Bennett was seamless with the GAR Bennett Support Team. Now I can focus on being a PCA and not have to worry about my growers being serviced."

JAMIE OLIVEIRA

"I was offered a great opportunity to work with a one of a kind family owned business that has great people to work with and a competitive compensation package that is transparent and easy to understand."

If you're looking for a rewarding career change and would like to **confidentially** explore opportunities with GAR Bennett, please contact our CEOs:

Greg Musson: gmusson@garbennett.com | (559) 908-9884

Tyler Bennett: tbennett@garbennett.com | (559) 289-0003

WE HAVE THE TOOLS TO SUCCEED

CROP PROTECTION

- Great PCA camaraderie
- Product availability
- Efficient and accurate product delivery
- Champion support team to ease your stress
- Precision Alfalfa Management (PAM) and Precision Silage Management (PSM)
- Gopher Management

WATER

- Water testing and evaluation
- Drip irrigation installs and repair
- Flood irrigation installs
- Deep well development and repairs
- Booster pump installs
- System automation and communication
- Project planning and design
- Dairy services

CROP NUTRITION

- Experienced agronomy support team
- Tailored fertility plans and custom blends
- Soil, plant and tissue testing
- Soil mapping
- Irrigation and Nitrogen Management Plans (NMP and INMP)

COMPLIANCE

- Food Safety Programs (**GLOBAL**G.A.P. and Primus GFS)
- Helping Growers receive certification and advance in Good Agricultural Practices
- Worker Safety including DPR Program and Cal/OSHA Program

SCAN FOR MORE INFORMATION

CAPCA

2600 River Plaza Drive, Suite 250 - Sacramento CA 95833
(916) 928-1625 - Fax (916) 928-0705
crystelle@capca.com - capca.com

Please enclose check payable to: CAPCA (A $25 FEE WILL BE CHARGED FOR RETURNED CHECKS)

License Number: _____ Email: _____

Name: _____ Cell Phone: _____

Mailing Address: _____ Work Phone: _____

City, State, Zip: _____ Employer: _____

Additional Chapters you wish to join: _____ CCA #: _____

ACTIVE MEMBERSHIP
Licensed PCAs must join as Active Members

- ☐ 2021 = $160.00
- ☐ *2020 = $160.00
- ☐ 2019 = $210.00

ASSOCIATE MEMBERSHIP
Non-PCAs - printout not provided

- ☐ 2021 = $45.00
- ☐ 2020= $45.00

STUDENT MEMBERSHIP
Must provide proof of full-time student status. May not hold a DPR license.

- ☐ 2020 = (no fee)

* ***A late fee of $50.00 will be charged for any 2020 Active Membership paid after December 31, 2020.***

☐ I WOULD LIKE TO OPT OUT OF ALL EMAIL COMMUNICATIONS. I understand that by opting out of email, I will NOT receive any information from CAPCA regarding CAPCA business or any information outside of CAPCA, such as emails from CAPCA Sustaining Members or industry stakeholders. This includes updates and notices about continuing education, programs and benefit opportunities. (Please be aware that CAPCA primarily utilizes email to communicate with members.)

☐ I DO NOT WANT MY MAILING ADDRESS UTILIZED OUTSIDE OF CAPCA PURPOSES.

☐ I DO NOT WANT $7.00 OF MY DUES TO GO TO CAPCA PAC** (Political Action Committee).

Update your email communication preferences through the CAPCA website
https://capca.com/manage-my-communications/
You can now define which crop team, chapter and event notifications you want to receive.

Which of the following categories are important to your work as a PCA (check all that apply):

- ☐ Aquatics
- ☐ Berries
- ☐ Citrus & Subtropicals
- ☐ Cotton
- ☐ Deciduous Fruits
- ☐ Forage/Silage
- ☐ Golf/Sports Turf
- ☐ Grains
- ☐ Grapes
- ☐ Rice
- ☐ T/O, Landscape
- ☐ Tree Nuts
- ☐ Vegetables
- ☐ Vegetation Mgmt
- ☐ Organics
- ☐ Hemp

Want access to your membership benefits quicker? Pay your dues online at capca.com/membership.

Federal Tax ID #94-2277533

Your dues payment is not deductible as a charitable contribution for federal and state tax purposes. However, a portion of your payment may be deducted as an ordinary and necessary business expense. Please advise your tax consultant if you qualify for an ordinary and necessary business expense tax deduction.
If you qualify for an ordinary and necessary business expense tax deduction, you may deduct up to $143/$35 for dues of $160/$45 respectively. If you chose not to earmark $7.00 of your dues as a contribution to CAPCA PAC and you qualify for an ordinary and necessary business expense tax deduction, you may deduct up to $150/$42 for dues of $160/$45.

**The CAPCA PAC Contribution is a voluntary non-tax deductible contribution.

For CAPCA Use Only

Check#_____

Amount_____

Ventura Chapter Awards Scholarships

Every year the Ventura Chapter activities include fundraising to help students who are pursuing a PCA career in Ventura County. Here are the award winners for this year:

Jaime Borunda, Oxnard: $1,500

Jaime is currently a senior majoring in Plant Sciences at California State Polytechnic University, Pomona. Jaime has completed an internship with Fruit Growers Laboratory in Santa Paula and has worked for local avocado and citrus growers. Jaime plans to become a CCA and PCA upon graduation.

Kyra Rude, Ventura: $1,500

Kyra is the general manager of Rincon-Vitova Insectaries. Although she has already completed her degree, Kyra is taking supplementary classes at Bakersfield College to become eligible to take the PCA exam. In addition to her work at the insectary, Kyra also tutors children for the non-profit School on Wheels program.

NEED CCA HOURS?

CE Hours Available for CCAs at https://capca.com/onlinece/

On-Demand Course:
FREP & CAPCA Nutrient Workshop, **CCA-only hours: 1.0 NM & 1.0 SW**
New hours posting in September and October.

CAPCA Annual Conference:
CAPCA is also pleased to announce **17.5 hours of CCA Accreditation** will be available during the 2020 CAPCA Conference.
Available from October 12th – 31st.
Visit **https://capca.com/conference**

WILBUR-ELLIS
AGRIBUSINESS

Standing the Test of Time, Together

Here's to 40-plus years as a sustaining member of CAPCA, and 100 years of Wilbur-Ellis as we approach our centennial anniversary on June 29th, 2021. We couldn't have done it without your support.

Thank You – Your Team at Wilbur-Ellis

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WILBUR-ELLIS
100 YEARS
SINCE 1921