

WEST COAST NUT

NOVEMBER 2019 ISSUE

SPOTLIGHT:

With SB1 in the Rear-View Mirror, California Can Now Look Toward the Future

SEE PAGE 42

IN THIS ISSUE:

Thermal Imagery—a Tool for Assessing Water Status in Almond Trees

SEE PAGE 4

New Outlooks for Hull and Shell Management Options Using Biosolarization

SEE PAGE 8

The Latest in Drone Technology

SEE PAGE 12

Women in Ag

SEE PAGE 16



SOUTH VALLEY
Nut & Citrus
CONFERENCE

November 20, 2019

See pages 66-67 for details

JCS

MARKETING
PUBLICATION

NEW

Navel Orangeworm Control!

Mating disruption product for conventional and organic California tree nuts!!

THANK YOU FOR YOUR BUSINESS!

STAY TUNED FOR NEW INFORMATION AND DATA!



Navel Orangeworm, *Amyelois transitella*



- Up to 80% or more potential reduction in damage vs. current insecticide program
- Season-long control through post-harvest
- Easy application with ready-to-use carrier pack
- No moving parts, no batteries, no gummy deposits
- Removal not required

CIDETRAK[®]

NOW MESO[™]

MATING DISRUPTION PRODUCT
FOR NAVAL ORANGEWORM IN
ALMONDS, PISTACHIOS & WALNUTS



Contact your local supplier and order now!

Visit our website: www.trece.com or call: 1-866-785-1313.



Made in the USA

© 2019, Trécé Inc., Adair, OK USA • TRECE, PHEROCON and CIDETRAK are registered trademarks and TM is a trademark of Trécé, Inc., Adair, OK USA • TRE-1590, 9/19



MARKETING

PO BOX 27772 | FRESNO CA | 93729

Publisher: Jason Scott

Email: jason@jcsmarketinginc.com

Editor: Kathy Coatney

Email: kathy@jcsmarketinginc.com

Associate Editor: Cecilia Parsons

Email: cecilia@jcsmarketinginc.com

Production: design@jcsmarketinginc.com

Tel: 559.352.4456

Fax: 559.472.3113

Web: www.wcngg.com

Contributing Writers & Industry Support

Almond Board of California

Contributing Writer

American Pecan Council

Contributing Writer

Danita Cahill

Contributing Writer

The California Walnut Board

Contributing Writer

Jenny Holtermann

Contributing Writer

Roger Isom

President/CEO, Western Agricultural Processors Association (WAPA), Contributing Writer

Julie R. Johnson

Contributing Writer

Rich Kreps

CCA, Contributing Writer

Oregon Hazelnut Board

Contributing Writer

UC Cooperative Extension Advisory Board

Elizabeth Fichtner

UCCE Farm Advisor, Tulare County

Franz Niederholzer

UCCE Farm Advisor, Colusa/Sutter/Yuba Counties

Emily J. Symmes, PhD

Sacramento Valley Area IPM Advisor

The articles, research, industry updates, company profiles, and advertisements in this publication are the professional opinions of writers and advertisers. West Coast Nut does not assume any responsibility for the opinions given in the publication.

Jhalendra Rijal

UCCE Area IPM Advisor, Merced, San Joaquin, and Stanislaus Counties

Emily Shea, PhD Candidate, Agricultural and Environmental Chemistry Graduate Group, UC Davis; Christopher Simmons

Associate Professor and Vice Chair, Department of Food Science and Technology, UC Davis; Director of Research and Outreach, Western Center for Agricultural Health and Safety, UC Davis

Crystal Nay

Contributing Writer

Mike Wade

Executive Director, California Farm Water Coalition, Contributing Writer

Amy Wolfe

MPPA, CFRE, President and CEO, AgSafe, Contributing Writer

WEST COAST NUT

By the Industry, For the Industry

IN THIS ISSUE

- 4** Thermal Imagery—a Tool for Assessing Water Status in Almond Trees
 - 8** New Outlooks for Hull and Shell Management Options Using Biosolarization
 - 12** The Latest in Drone Technology
 - 16** Women in Ag
 - 22** Grower Profile—Jocelyn Anderson
 - 26** Meet the New UCCE Farm Advisors
 - 28** Increasing Evidence of Pacific Flatheaded Borer Attack in Walnut Orchards in California
 - 34** Want to Thrive Postharvest? Make a Plan
 - 38** Harvesting Strategies to Reduce Dust
 - 42** With SB1 in the Rear-View Mirror, California Can Now Look Toward the Future
 - 46** CDFA Introduces New Farmer Resource: Web-Page for Farmers & Ranchers
 - 48** Honey Bees, Small but Impactful
 - 52** Increasing Yields and Reducing Inputs
 - 54** Farm Spotlight: Burroughs Family Farms
 - 58** Churchill Fellow Visits Oregon During Global Hazelnut Expedition
 - 60** Preventing Soil Erosion in Young Hazelnut Orchards
 - 64** Walnut Pest Management: Walnut Husk Fly & Pacific Flatheaded Borer
 - 68** Almond Variety Trial Continues
 - 72** Expanded Cal/OSHA Reporting Requirements for the New Year
 - 76** California Legislative Wrap-Up for 2019
 - 80** American Pecans
 - 82** FSMA Produce Safety Inspections: What to Expect
- View our ePublication on the web at www.wcngg.com

From the Editor

In the October 2019 issue, Compost—Is it Right for my Operation has a sentence correction and should read:

New Era is a Tulare based compost manufacturing company and only uses dairy manure to make its compost, instead of dairy manure, green waste and other products.



THERMAL IMAGERY— A TOOL FOR ASSESSING WATER STATUS IN ALMOND TREES

By CECILIA PARSONS | Associate Editor

TO MEET INCREASING

demand for reduced water consumption, California almond growers know efficiency in irrigation practices must improve. One of the improvement avenues identified by research is a more precise method of assessing tree stress. As a three-year study of thermal imagery continues, researchers aim to develop a method that will use inexpensive thermal imagery to evaluate tree water needs and help growers with management decisions.

Research

Work funded by the Almond Board of California (ABC) and lead by Brian Bailey of the University of California (UC) Davis Plant Sciences Department showed that using a forward-looking infrared radar device (FLIR) on an iPhone or Android can deliver adequate image resolution and spectral range providing the first step toward a goal of developing a quick and inexpensive tool to evaluate tree water needs in order to guide irrigation decisions.

Their objectives in this research were to develop a model for evapotranspiration inversion from thermographic imagery, to collect validation data for model calibration, validation and testing and to develop a smartphone application for distribution.

Thermal Imaging Cameras

Thermal imaging cameras are actually sensors that make photos from heat, not visible light—like most other cameras. Heat, also called infrared or thermal energy, and light are both parts of the electromagnetic spectrum, but a camera that can detect visible light won't see thermal energy and a thermal imaging camera (sensor) won't detect visible light.

Thermal cameras can detect more than heat, they can detect tiny differences in heat, as small as 0.01 degree Celsius (C) and display them as shade of colors. FLIRs can detect these color differences and translate them into image detail. When two objects next to one another have even subtly different heat levels, they show up clearly to an FLIR regardless of light conditions. FLIRs detect temperature differences and translate them into image detail.

The FLIR One Pro is a lower cost alternative at \$399 that delivers 160 by 120 resolution, a spectral range of 8-14 micrometers and operates with an iOS or Android. The accuracy of the FLIR One Pro camera was assessed by comparing the temperature measured by the camera with that of a thermocouple pressed against the leaf surface.

Assessing Water Status

Dr. Bailey, outlined the ABC funded research in thermal imagery for assessing water status at the 2018 Almond Conference. The goal of the research was to investigate thermal imagery as a low cost and low time water status measurement method and develop a means for

rapidly measuring spatial variability in water status.

Dr. Saa, Senior Research Manager of ABC, explained that water lost by the leaf in transpiration creates a cooling effect and can reduce the leaf temperature to several degrees below the ambient air temperature in the case of a well-watered tree. As trees deplete their water source, transpiration begins to decline and the temperature range between the leaf and the air temperature is reduced.

The challenge in using that temperature as a basis for an irrigation decision, Saa said, is that transpiration can be affected by many factors different from temperature. Other factors include weather, sunlight, air temperature, humidity and plant health.

"We need more information than just the temperature to make irrigation decisions, and that is why Dr. Bailey's research is relevant," Saa said. What Dr. Bailey and his collaborators are seeking is a model for using the leaf temperature that also calibrates other data.

To develop that approach, a group of measurements were collected for a number of both shaded and sunlit almond tree leaves.

Thermal images were obtained from leaves with the FLIR smartphone camera to provide the spatial distribution of surface temperatures across the leaf, forming the basis of the measurement technique. Minimum and maximum possible leaf temperatures that could exist given current weather conditions

Continued on Page 6



MOVENTO[®]



FORTIFIED

THAT'S HOW ALMONDS FEEL WITH MOVENTO.[®]

Movento[®] insecticide is the only foliar application with downward movement within the tree to protect roots by suppressing nematodes. With Movento, trees will show improved vigor and produce high yields year after year.

For more information, contact your retailer or Bayer representative or visit www.Movento.us.

Continued from Page 4

were determined by placing reference leaves within the image of the leaf of interest. To measure the minimum possible leaf temperature, a leaf was sprayed on both sides with water about one minute prior to measurement of its temperature. The maximum possible leaf temperature was obtained by covering a leaf with petroleum jelly on both sides.

Non-leaf reference surfaces were also placed in the image of the leaf of interest to determine if they could effectively predict the dry leaf temperature of the ambient air temperature. Reference surfaces considered are white, green and black paper.

After the pictures were taken, the stem water potential of the leaf are measured using a pressure chamber. Maximum stomatal conductance and photosynthesis rate were also measured.

Challenges to This Technology

As pointed out earlier, the challenge with this technology is that the

temperature of a leaf is influenced by many other factors besides how much water a tree receives. Those factors include weather, sunlight, air temperature and humidity. The cost of the camera can also be a limiting factor in adoption, along with speed of relaying information. Dr. Bailey's report said one aim of the study was to determine if a smartphone based thermal camera that can be purchased for around \$200 can assist with guiding efficient irrigation practices.

In Conclusion

The ABC research report concludes that the FLIR One Pro smartphone thermal camera appears sensitive and precise enough to detect topical differences in leaf surface temperature created by varying irrigation treatments. It does not appear accurate enough to consistently compare the thermal temperatures with other independent measures of temperature such as through a nearby weather station or other handheld temperature sensor. The report determined

that thermal images must be calibrated against other measured temperatures within a given image. The approach moving forward for measurement of individual leaves will be to primarily consider shaded leaves placed on a sheet of black paper. Shaded leaves appear preferable, because thermal temperatures are more consistent, yet the effect of water treatment is still discernable.

The black background allows for easy separation between the background and leaf surfaces in the thermal images. Strong correlations were observed between the temperature of green paper and the dry leaf temperature, allowing use of the temperature of the shaded green paper in the image to calibrate actual transpiring leaf temperature against that of a dry non-transpiring leaf.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

GET READY for our 2019-2020 Trade Shows
New Names, Same Great Experiences!

In 2018-2019 we had:

- 1,268** PCA/CCA Attendance
- 3,336** Total Attendees

Come experience our shows for **YOURSELF!**

JCS MARKETING
AG MARKETING SOLUTIONS

Events listed on the map:

- NORTH VALLEY Nut Conference** January 21, 2020 (Orland, CA)
- California WALNUT CONFERENCE** January 10, 2020 (Yuba City, CA)
- Mid Valley AGDAY** June 3, 2020 (Turlock, CA)
- WAPA** June 10-12, 2020 (Monterey, CA)
- Central Valley Almond Day** June 24, 2020 (Fresno, CA)
- Crop Consultant CONFERENCE** 2020 TBD (Visalia, CA)
- SOUTH VALLEY Nut & Citrus CONFERENCE** November 20, 2019 (Tulare, CA)
- KERN COUNTY Ag Day** October 24, 2019 (Bakersfield, CA)

Follow us: @jcsmarketing, JCS Marketing Inc., @jcs_marketing

For more info visit: www.wcngg.com/events

A man wearing a white baseball cap and a dark blue t-shirt is shown in profile, looking down at a branch of white flowers. He is gently touching the blossoms with his hands. The background is a soft-focus field of similar white flowers under bright, natural light.

TRUST

HELM's reputation for quality reflects 118-years of tradition and heritage, built and strengthened through trust.

With a passion for people, products and service, we deliver best in class crop protection, reliable supplier support and strong relationships that will stand the test of time.

Earning Your Trust is Our Vision for Success.

QUALITY • PERFORMANCE • RELIABILITY • VALUE • INDEPENDENCE



One of the larger orchard trials with Nicolaus Nut Company in Chico. All photos courtesy of UC Davis.

New Outlooks for Hull and Shell Management Options Using Biosolarization

By EMILY SHEA | PhD Candidate, Agricultural and Environmental Chemistry Graduate Group, UC Davis

CHRISTOPHER SIMMONS | Associate Professor and Vice Chair, Department of Food Science and Technology, UC Davis; Director of Research and Outreach, Western Center for Agricultural Health and Safety, UC Davis



Our software, Nutware, provides a complete solution for inventory control, shipping, and grower accounting. Including traceability, grower & sales positions, barcoded inventory, and integrations with scales and mobile devices.

Nutstar is located in central California, allowing face-to-face consulting and training.

We have successfully customized software for the tree nut industry for nearly 15 years and over 60 customers nationwide and internationally.

Duration for installation: 1-3 months.



For more more information please call our office at (209) 250-1324 or visit NutStar.net

ALMONDS ARE AMERICAN'S FAVORITE tree nuts by far¹, but what many consumers do not realize is that the kernel we eat is only 27 percent of the nut. The majority of the almond nut—the hull and shell—is a byproduct.

It is estimated that 1.6 billion pounds of shells and 4.5 billion pounds of hulls are co-produced with kernels annually, a number that is only expected to increase as more almond trees are planted in California².

Despite being inedible, hulls and shells are resources in their own right. The hull—similar to the flesh of other stone fruit like peaches and cherries—is rich in sugars and is used in dairy cattle feed, and the fibrous woody shell is used as animal bedding. Despite this, novel management options are needed as almond production outpaces demand for feed and bedding.

Confronted with this problem, University of California (UC), Davis researchers seek new uses for almond hulls and shells. The goal is to develop new ways to recycle these materials in orchards near where they are produced. With this in mind, soil amendment strategies are being explored in the context of biosolarization, an integrative soil pest management technique.

Biosolarization

Biosolarization, sometimes called anaerobic soil disinfestation or ASD, is a pre-plant soil treatment used

to control soilborne pests. Biosolarization can promote inactivation of a broad range of soil pests that are relevant to a variety of crops, including almond orchards. In the case of orchards, some of these pests—parasitic nematodes and other pathogens—feed on roots and can kill or stunt almond saplings. This is known as “replant disease” and can affect one third of California almond acreage if left untreated³.

Traditional solarization has been used as a pest management tool for decades. Simply covering moist soil with clear plastic during the hot summer months can increase soil temperatures above 120° F, more than enough to kill many pests. Unfortunately, solarization typically underperforms in orchards and other cropping systems as soil heating is limited to shallow depths and is critically dependent on the weather.

Organic matter such as almond hulls and shells can potentially solve this problem. By amending soil with organic matter before solarization, biosolarization may promote disinfestation to greater depths than traditional solarization, shorten the treatment duration, and guard against unpredictable performance owing to the weather and variable solar heating.

Biosolarization using hulls and shells presents multiple benefits to California agricultural soils by:

- Taking advantage of local and abundant biomass to promote zero-waste crop production.
- Adding organic matter to the soil to promote soil health and water retention in the root zone.
- Providing more environmentally friendly pest management than conventional pesticides.

Why does it work? Biosolarization uses multiple modes of action that act together to kill soil pests. In addition to the soil heating, microorganisms in the soil consume and degrade the amended organic matter. In doing so, they convert the sugars from hulls and shells into organic acids—natural “biopesticides”

that can quickly disperse into deeper soil layers. These compounds are toxic to many pests but are relatively safe for humans and benign soil microbes.

Depending on the temperature, biosolarization can eliminate pests in 8-10 days.

Soil Health Benefits

Recycling hulls and shells into the soil can deliver other benefits to soil

health and crop production. For example, adding organic matter to soil increases water infiltration into soil along with the water holding capacity of soil, which can decrease runoff of rain water.

Adding these materials can also improve soil fertility. Almond hulls and shells naturally contain nitrogen

Continued on Page 10



Prepare your Nut Trees for Next Season with the Westbridge Post-Harvest Program

ORGANIC TRIGGRR®
Contains Auxiliary Soil & Plant Substances

ORGANIC BIOLINK®
Plant Nutrients

The Westbridge Post-Harvest Program is designed to increase root growth and improve nutrient uptake of fall fertilizers, preparing trees for next year’s growing season.

Apply a soil or foliar application within 30 days after harvest to:

- Improve winter hardiness
- Increase root growth and perennial wood
- Improve fruit bud vigor, which can lead to reduced alternate bearing.

Program Includes:

- Organic TRIGGRR®
- Organic BioLink® Cal-Plus 7%*
- Organic BioLink® 3-3-3 Fertilizer
- Organic BioLink® Micronutrients

*When plants are in need of more nitrogen, Organic BioLink® Cal-N can be substituted for Organic BioLink® Cal-Plus 7%



Westbridge®

(800) 876-2767
www.westbridge.com

Continued from Page 9

and potassium. As these residues are degraded, these nutrients are released and become available to plants. In addition, almond hulls and shells are rich in carbon which can increase microbial biomass, thus promoting more rapid degradation and nutrient release.

Given enough time, hulls and shells can be converted into stable “soil organic matter” or humus. These complex polymers act as glue and improve soil

structure; pores form between aggregates that allow aerated spaces for roots to grow and access nutrients. Humus also has high cation exchange capacity and allows soil to retain nutrients, acting as slow release fertilizer. Finally, humus is extremely stable and can remain in soil for hundreds of years, resulting in long-term carbon sequestration.

Lab Assessment of Biosolarization

In collaboration with the Almond

Board of California and with additional support from the Western Center for Agricultural Health and Safety, researchers at UC Davis have worked to test and improve biosolarization using hull and shell amendments for use in both perennial and annual cropping systems. Before this technique was first implemented on fields, validation and fine tuning began in the lab.

The first step was assessing the unique properties of hulls and shells. The high sugar found in almond hulls could promote faster pest-inactivation, although fiber-rich shells potentially have longer lasting effects. Given these differences, material from the Nonpareil variety, which has a thin and soft shell, a mixture of pollinator varieties, which have thick shells, and one residue stream comprised of only shells were tested.

Ideal materials for biosolarization can induce pest-inactivating conditions in the soil in eight days or less. All materials were tested to ensure they met this threshold. Lab-scale biosolarization was performed using small soil ‘reactors’ that simulate soil amendment, moisture, and temperature conditions. Both the mixed pollinator and Nonpareil hulls and shells promoted rapid production of organic acid biopesticides in the soil, while the soils containing only shells proved too difficult for soil microorganisms to rapidly break down and no biopesticides were detected.

Interestingly, it was observed that even before biosolarization, the addition of hulls and shells to the soil increased the level of organic acid biopesticides in the soil, namely succinic, acetic, and formic acids. These compounds, which naturally occur within almond hulls, can benefit pest inactivation during biosolarization and are further amplified as soil microorganisms transform the amendments.

After showing that hulls and shells could promote pest-inactivating conditions in the soil, root lesion nematodes (a common soil pest) were then exposed to the soil extracts. Results were clear: the more hulls and shells that were added to the soil, the more nematodes were inactivated.

The next step was to ensure the results from the lab translated to real-world

F3015
DESIGNED FOR EXPERTS

2.2" CUTTING CAPACITY
PATENTED SAFETY SYSTEM
USE WITH POLES 4' - 11'5"

TRY IT JAN 10TH 2019
@ THE CALIFORNIA
WALNUT CONFERENCE

ULTRA-COMPACT
LITHIUM-ION BATTERY
CHARGES IN 1.5 HOURS

GOT QUESTIONS ?

INFACO
www.infaco-usa.com

CONTACT@INFACO-USA.COM
800-425-8809



A smaller test plots used to gauge the use of biosolarization with almond residues for other California crops.

scenarios, with uncontrollable variables such as weather, soil heterogeneity, and nematode behavior.

Bringing Biosolarization to Field Trials

In 2016, the Nicolaus Nut Company volunteered an eight-acre subset of their orchard for this collaboration. They had recently removed an old walnut orchard and were looking for fumigant-free pest control before planting almond saplings.

Thirty 10 by 950 foot plots were randomly treated with biosolarization using either Nonpareil hulls and shells or the pollinator variety hulls and shells. These were compared to two controls: traditional solarization and no treatment. Biosolarization lasted for six weeks, and the soil was monitored for ring and lesion nematode counts.

The results were promising. All nematodes were controlled at least nine days after treatment. This was likely due to the temperature extremes, which peaked over 140°F, and high organic acid biopesticide concentrations during biosolarization.

Encouraged by the results, the Chico orchard was planted in the following winter and the soil continues to receive monitoring. Potentially harmful nematode populations are periodically tracked, and to date no re-emergence has been observed.

There have also been noted improvements in soil fertility. In the first year of growth, biosolarization increased total soil carbon, nitrogen, and potassium. This has potential long-term benefits to tree growth and yield.

The growth of the trees, spanning three varieties, continues to be tracked to measure how the trees adapt to the biosolarized soils and will eventually culminate in measurement of any changes to yield during the first harvest.

Beyond orchard applications, additional field work is exploring utilization of hulls and shells for biosolarization to manage soil pests in other crops, such as tomatoes and berries. By developing multiple biosolarization avenues, research aims to maximize opportunities to add value to California's abundant supply of hulls and shells.

Interested growers should connect with UC to explore opportunities for demonstration trials.

References

1. USDA 2016, Almonds lead in tree nut consumption <https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=93152>
2. ABC 2018, hull and shell production

http://www.almonds.com/sites/default/files/Almond_Almanac_2018_F_revised.pdf

3. UCANR 2013, Managing the almond and stone fruit replant disease complex with less soil fumigant <http://calag.ucanr.edu/Archive/?article=ca.v067n03p128>

Christopher Simmons
 cwsimmons@ucdavis.edu
 UC Davis Department of Food Science and Technology
<https://foodscience.ucdavis.edu/people/christopher-simmons>

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

Suterra[®]

CheckMate
Puffer[®] NOW Ace[™]

- ✓ Reduce Damage from Navel Orangeworm
- ✓ New for 2020
- ✓ One per Acre

See us at CAPCA
 or ask your PCA for details.

The Latest in Drone Technology



There's one in every block—or maybe two or three—or more.

By CECILIA PARSONS | Associate Editor

STRESSED TREES AND PEST outbreaks in large orchards are not always easy to see with “on the ground inspections.” Time and cost for labor in checking orchards comes into play. There is also the possibility of an incorrect diagnosis. Identifying problem trees or areas and determining reason for tree stress can now be done with aerial drone technology.

Aerial Drone Technology

Chris Lawson, development manager for Aerobotics, a Cape Town based AgriTech startup, said aerial drone technology can assist growers and farm managers in identifying health or pest problem areas in large orchards. The company was co-founded by James Paterson (CEO) and Benji Meltzer (CTO) in 2014.

In Lawson's presentation at the first annual Crop Consultant Conference, he said drones, combined with machine learning algorithms identify areas in orchards where pest and disease are potentially present. Lawson said the drones could survey large areas, providing timely data on 600-700 acres a day. The level of detail is high, he added, allowing for quick adjustments in nutrition or pest control to prevent crop losses.

While irrigators might report “a rough looking area about three rows from the end,” camera carrying drones can pinpoint location of individual trees or orchard zones exhibiting stress-related problems. With that information, growers or orchard managers can fix the problem early, saving labor costs and averting yield losses.

Multi Rotor Drones

Lawson said Aerobotics uses multi rotor drones that are equipped with two types of cameras: visual and multi-spectral. The visual cameras capture tree counts and missing trees. The multi spectral cameras provide per tree analytics including health, canopy, volume and height, and NDVI—normalized difference vegetation index. This index assesses crop vigor based on a mathematical interpretation of color and near infrared data. Cost for the initial data collection flight is \$12 per acre.

Individual trees under significant stress and areas where groups of trees are stressed are identified in images that can help growers pinpoint orchard areas for scouting and sampling operations.

Scouting orchards for diseases, pest problems or nutrient deficiencies without the drone-collected data can be time consuming and not cost effective,

Lawson said. The images from the drones will allow for building zones in an orchard where tissue samples can be taken and insect pests can be monitored. Lawson said a citrus grower who suspected a chlorosis problem in a small area, found out nearly 400 trees were affected after using the aerial drone technology.

The trees were young and the grower was able to remedy the problem, before yields were affected. A similar scenario found a much more extensive shot hole problem in an almond orchard for a grower.

Scouting App

Lawson said Aerobotics also has a new scouting app to assist with reporting orchard health. Aeroview InField is a data-capturing app for pest and disease management. The app benchmarks crop monitoring with visuals that might be overlooked with in-person scouting. The app has a tree detection algorithm that leads to the stressed trees. Once the data has been collected, growers can take on further on-the-ground assessments and crop treatments. Coupled with the high-resolution drone data, a scout route can be created for on the ground assessments.

Continued on Page 14

All the major weeds

All the soil types

All times of the year

All the key tree & vine crops

**Weed control can be so
*UNCOMPLICATED***

Matrix[®] SG

HERBICIDE

Matrix[®] SG herbicide makes controlling weeds easy. It provides pre- and early post-emergent control of important weeds like fleabane, marestail, filaree, malva, willowweed, annual bluegrass and Italian ryegrass on all the key permanent crops. There are no soil type or organic matter restrictions, and no dormant or non-dormant cut-off dates. You can even apply Matrix to young trees and grapevines that have been established for at least one full growing season. With Matrix, weed control is so uncomplicated.

Continued from Page 12

The change from Aerobotics' initial app, Aeroview Scout, is that more than one marker per tree can be added. This allows for multiple data points and more precise data capturing. Markers can be accompanied by custom notes, photos taken on your smartphone and qualifying data of in-field problems.

Improved reporting structures with custom thresholds for pests can be shared. Weekly reports can be downloaded in various formats. The new app can facilitate upcoming software developments such as Drone Scouting. Drone scouting allows farmers who own and fly drones to collect data when needed. The tool is used to control the drone and position it within a five-meter range of stressed trees to capture a 360-degree visual of each

tree. Thereafter, the data is interpreted to identify problems without farmers having to walk into the orchard.

KARE Drone Usage

Drone technology is being used at the UC Kearney Agricultural Research and Education Center (KARE). A University of California (UC) Davis Department of Plant Science blog reported that Cooperative Extension agricultural engineering advisor Ali Pourreeza has been using a camera-equipped drone and using photogrammetry and software to make a three dimensional point cloud model of an orchard.

Blogger Jeanette Warnert wrote that the computer program could make colors that are invisible to the human

eye—near infrared, red edge and ultra-violet—into imagery that showed key crop health indicators. Near infrared indicates the amount of healthy foliage, plant vigor and crop type. If the trees have low near infrared values, it means the plants are under stress. Red edge indicates plant stress and nitrogen content. High red edge values indicate nitrogen stress and low water content in plant tissues. By looking at the previously invisible colors, growers can manage orchards for optimum production and efficiency.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

SOIL PRO

Nature's way back to Soil Health



A Bio-Formulated Agricultural Soil Improver

SOIL PRO is a proprietary blend of naturally occurring bacteria which will help restore your soil to optimal conditions.

- Naturally out-competes soil pathogens
- Controls Gault and Canker
- Healthier plants
- Reduces water usage
- Cost effective
- Stimulates plants natural immunity

OMP1
NATURAL

SOIL PRO
Soil Pro enhance root and overall plant growth.
Beneficial micro-organisms
Water proof barrier
Adhesion to roots

LIVENTIA™
THE POWER OF LIFE

Manufactured by Micro-TESS, Inc

Rick Reynolds
510-334-4711
liventia.net/en/agriculture

LIVENTIA™
THE POWER OF LIFE

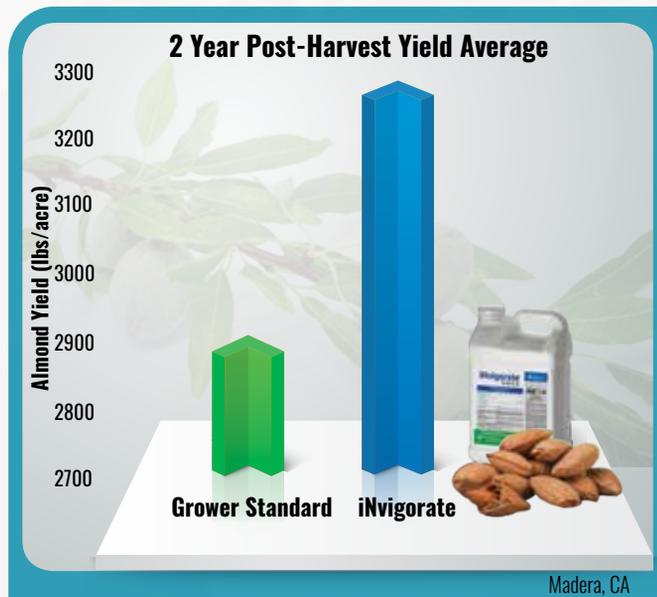


Innovative by Nature

Give Your Trees the Boost They Need this Post-Harvest

iNvigorate® 0-0-0.5

Almond growers apply nitrogen as a key practice in hopes that their trees gain maximum benefit from the application. Why hope? Almond growers *can* increase nutrient uptake and improve fertigation efficiency at **post-harvest** with **iNvigorate** through drip or micro sprinklers. Pacific Ag Research has *proven* with a 2-year study that applying **iNvigorate** microbes to your **almond program** stimulates root growth and plant development as well as increases soil's organic matter and microbial community. **iNvigorate** vitalizes root biomass formation, resulting in a more *vigorous* root system and *enhancing* yield under both favorable and stressful growth conditions. See study below:



iNvigorate at 2 qt/acre applied post-harvest resulted in 11% greater yield over the Grower Standard Program

Available for Purchase Through Your Local Retailer.

BOOST Your Bottom Line by Contacting Us Today

Contact: Mark Abildgaard | **Phone:** 909-908-1670 | **Email:** Mark.abildgaard@agrinos.com

Contact: Toby Leonard | **Phone:** 530-701-7100 | **Email:** toby.leonard@agrinos.com

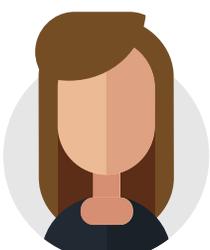
Website: www.agrinos.com

iNvigorate® is produced by a fermentation process utilizing a consortium of microbes that creates a highly productive microbial system in the soil. Ask us about our custom post-harvest Programs for tree nuts



WOMEN IN AG

By JENNY HOLTERMANN | Contributing Editor



FROM BOARD ROOMS TO hospitals to classrooms and even the farm, women are a growing segment to any business. More women are in leadership roles and executive positions in various different industries. It should be no surprise that agriculture is the same. According to the 2017 Census of Agriculture, more than 36 percent of farm operators are women, equally over 1.23 million nationwide. While the percentage of farms with women decision makers continues to grow, the number of male farmers fell by 1.7 percent to 2.17 million. Women are making an impact in the way businesses are run from the ground up. The changes also show 56 percent of all farms have at least one female decision maker. The numbers speak for themselves and show women are taking on new roles with farms and agriculture businesses, but also opening up new doors to young women in showing capability and willingness to succeed.

Agriculture Career Paths for Women

Women are strong and successful,

leading the charge to encourage and support young women as they consider career paths and leadership roles. The future is daunting and intimidating to anyone. Agriculture can be a tough industry with roadblocks and setbacks to anyone starting out or trying to nudge their way in. There have been a number of movements created to empower women. Various different campaigns have been spread on social media and hashtags to inspire young women with positive example of leadership and hard work.

Ag Women Lead

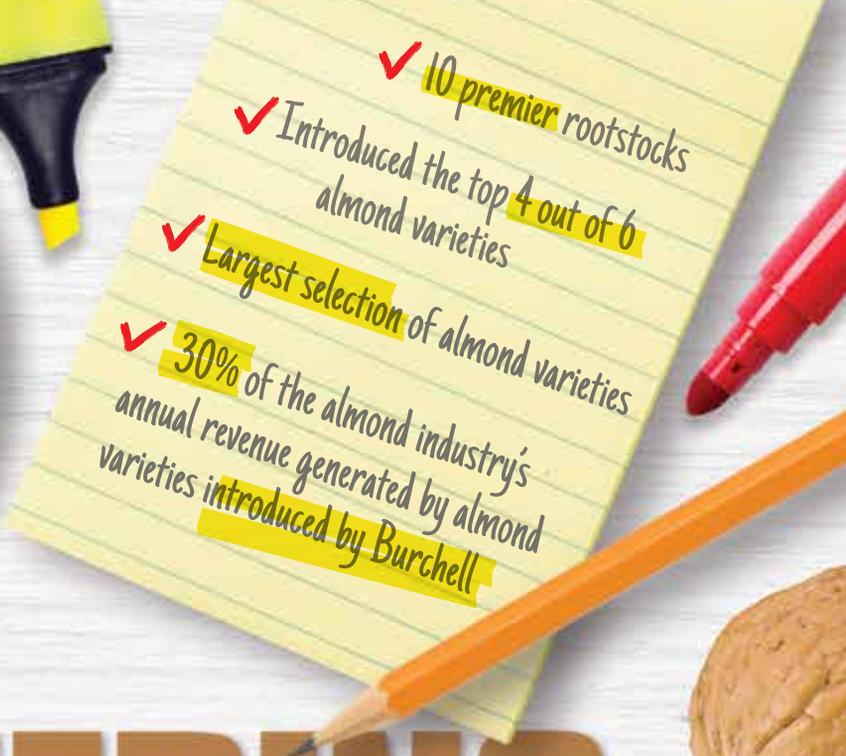
The United States Department of Agriculture (USDA) set up an “Ag Women Lead” agriculture mentoring network for women to not only create conversation but to lead by example. Through hashtags such as #womeninag and #farmher you can search and find an abundance of women sharing their everyday struggles and successes. Through organizations like the American Agri Women or the Women’s Leadership Development Program of the American Farm Bureau, there

“According to the 2017 Census of Agriculture, **more than 36 percent of farm operators are women**, equally over 1.23 million nationwide.”

are training programs in place to help enhance leadership skills and create advocates for women in agriculture.

In the 21st century, we live in a place that strong willed, hard working people thrive. Regardless of your race, sex or age if you show leadership and determination, you can be successful. There are many examples of people stepping up to make a difference in agriculture and engaging in their industry and scope of work to make a difference. In this edition, we highlight a few of these women who are paving a path of expertise in the nut industry.

Continued on Page 18



- ✓ 10 premier rootstocks
- ✓ Introduced the top 4 out of 6 almond varieties
- ✓ Largest selection of almond varieties
- ✓ 30% of the almond industry's annual revenue generated by almond varieties introduced by Burchell

EXCEEDING EXPECTATIONS

Burchell Nursery has the largest selection of almond varieties, the most rootstock options and the distinction of having the only **In-house Nut Breeding Program** focused exclusively on nut varieties.

To learn more about Burchell Nursery's exclusive SHASTA® BA2 var. (PP#28,466) self-fertile almond or one of its premier rootstocks for almonds **CALL 800-828-TREE NOW** stop by the Oakdale or Fresno office or visit **burchellnursery.com** for the best selection for 2020.



BURCHELL NURSERY

burchellnursery.com 800 828-TREE



© 2019 The Burchell Nursery, Inc.



CANDICE ESPERICUETA

Photo courtesy of Candice Espericueta.

NAME OF FARM OR BUSINESS:

Certified Crop Advisor (CCA)/ Pest Control Advisor (PCA) for Maricopa Orchards

CROPS YOU FARM:

Our team farms almonds, cherries, citrus, and blueberries in southern Kern County.

HOW DID YOU GET INVOLVED IN AGRICULTURE?

I don't have a farming background, but always had an interest in getting dirty and playing with bugs. After I joined FFA (Future Farmers of America) in high school, I realized all the cool ways I could do what I loved and make a living at it. While pursuing a B.S. in Biology, I got a job with the cotton research station in Shafter while going to college and I knew I was exactly where I was supposed to be.

WHY DO YOU DO WHAT YOU DO EVERY DAY?

I do what I do every day because I truly love it. I love diagnosing problems, preventing them before they start, and just being out in cultivated nature. Every day I'm on the job I learn something new. That's the beauty of working in nature, it's ever-changing and keeps me on my toes!

WHAT ADVICE CAN YOU GIVE OTHER WOMEN IN AGRICULTURE:

Don't let anyone tell you that you can't be a mom and still work in Ag. There are progressive companies out there who value family time and flexible schedules. You can literally have it all, so go for it and don't settle.



DANIELLE VEENSTRA

Photo courtesy of Danielle Veenstra.

NAME OF FARM OR BUSINESS:

Almond Board of California, Veenstra Farming

CROPS YOU FARM:

Our family farms almonds outside of Escalon, California

HOW DID YOU GET INVOLVED IN AGRICULTURE?

Like so many in this industry, I grew up in it. My mom's side of the family has been farming the same land outside of Escalon, California since the early 1900's. On the other side of the family, my grandfather, planted our first almond orchard in 1965—land that I grew up on and still live on today. We're now on our second orchard and, outside of my day job, I help out on the ranch as needed. My favorite task is checking sprinklers, ensuring each emitter is working and there are no leaks in the hoses when we irrigate.

WHY DO YOU DO WHAT YOU DO EVERY DAY?

Working for the Almond Board, my job each day is to best represent California's 7,600 almond farmers. It's a complicated task, highly strategic and challenging, but one that I am passionate about because I know and am part of that community. When things get tough or the demands of the job are pushing my limits, I remember who I'm working for—people like my dad, brother, uncle and cousins. As farmers we strive to be stewards of the land so we can pass it on to future generations and, with the recently launched Almond Orchard 2025 Goals, I'm proud to work for an organization that's challenging our farmers, other agricultural industries and farming regions around the world to continuously improve.



THERESA SCHNEIDER

Photo courtesy of Theresa Schneider.

NAME OF FARM OR BUSINESS:

A&J Family Farms, Inc.

CROPS YOU FARM:

Walnuts and almonds in Chico, California

HOW DID YOU GET INVOLVED IN AGRICULTURE?

I am a 4th generation farmer, I have been involved in agriculture my whole life. Growing up with my father farming and raising livestock through 4-H and FFA.

HOW DID YOU END UP ON YOUR CURRENT FARM OR BUSINESS?

I always knew that I would end up in some sort of agriculture field. I dreamed of becoming an agriculture instructor at the high school level. Upon graduating from UC Davis there was an opportunity to start working with my dad. Greatest decision of my life. He taught me so much, yet not everything and I am still learning from him every day.

WHY DO YOU DO WHAT YOU DO EVERY DAY?

I do what I do for the love of the land. Farming is in my blood. It is the traditions that I want to continue to the next generation; the value of hard work and getting your hands dirty. Every day is different; no set hours, no daily grind. It is truly a blessing to be able to farm and feed the world.

Continued on Page 20



Watch videos of Flory products in action... goflory.com



BEELER TRACTOR CO.

YUBA CITY
887 Onstott Rd • CA
(530) 673-3555

COLUSA
1954 Hwy. 20 • CA
(530) 458-5196

ANDERSON
2025 Barney Rd • CA
(530) 378-1116

CNH INDUSTRIAL GENUINE PARTS

www.BeelerTractor.com



**HOLLY
KING**

Photo courtesy of Holly King.

NAME OF FARM OR BUSINESS:

Outback Almonds/Triple Crown Holdings, LP

HOW DID YOU GET INVOLVED IN AGRICULTURE?

I was born and raised on a cattle ranch and farm in the Klamath Basin growing alfalfa, sugar beets and grain. I got involved in almonds 25 years ago when my family partnered with the Gardiner Family to diversify our holdings beyond the Klamath Basin. We bought the dirt, the Gardiner's put in the trees and we had a 50-50 partnership that expanded over the years when we sold ground next to town, moved out to the Shafter area in Kern County, and then had the opportunity to buy amazing dirt from Jackson Perkins, the rose company, in the Wasco area. We put an agricultural conservation easement on 1,000 acres of the ranch to make sure it remained in agriculture in to perpetuity.

WHY DO YOU DO WHAT YOU DO EVERY DAY?

I love agriculture as an industry, the people are grounded and the best people in the world. I have made a career in agriculture and I want to see the industry continue to thrive in California. That is why I serve on the Almond Board of California—I contribute my time to try and pave a successful future for the industry.

WHAT ADVICE CAN YOU GIVE OTHER WOMEN IN AG?

I have never found that leading with your gender is anyway effective. Lead with your skill set, experience, earning the trust and respect of those around you enhances your reputation for all women.

Thank you, ladies, for sharing a small insight into what you do and helping to inspire other women in agriculture.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

Peterson Mass Trapping is proven to attract, trap, and kill more female NOW than any other method.

PETERSON TRAP COMPANY LLC

559.577.4695 • petersontrapco.com

SORTEX® BioVision™ technology. Optical sorting redefined.

SORTEX F® now available with SORTEX® BioVision™ Technology. Simultaneous color, shell and foreign material detection for the nut processing industry.



Find out more.
T+ 1 209 983 8400 sortexsales@buhlergroup.com
www.buhlergroup.com/sortex-f

GROWER PROFILE— JOCELYN ANDERSON

By JENNY HOLTERMANN | Contributing Writer



Jocelyn with walnuts in dryer. All photos courtesy of Jocelyn Anderson.

TO JOCELYN ANDERSON, farming is a family tradition that has been passed down on both her mother and father's side. Farming, however, wasn't always where she envisioned her life taking her. Anderson's maternal great grandparents moved to Anaheim from the Netherlands and started farming oranges. In search for more farmland her grandparents moved to Willows, California. They started a small farm, primarily farming sugar beets, row crops and rice.

Jocelyn's Dad, Gary, also grew up farming. His parents met at Cal Poly, San Luis Obispo and farmed walnuts in Paso Robles. They sold the farm eventually to move up north to the Bayliss area as well for better opportunities in agriculture. With the expertise in walnuts and background as a Pest Control Advisor (PCA), Gary later joined his wife's family business and expanded from corn, winter wheat, and alfalfa to add almonds and walnuts to the mix.

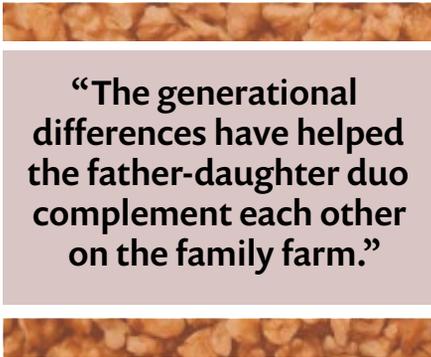
Growing up Jocelyn wasn't very involved in farming. She was active in 4-H but swimming was more her passion. She remembered being, "Too involved in swimming in high school and even in college, to pay much attention to what was happening on the farm." It wasn't until after college, when she became an elementary school teacher that she started to gain an interest in agriculture.

Jocelyn recalls, "When I started

teaching in Clear Lake, the kids had little involvement or knowledge of agriculture. I would bring science and agriculture into my lesson plans with walnuts and rice. My last two years of teaching, I taught in Willows, and there was more agriculture influence present in the community so the kids were more familiar when I brought it into the classroom." It was after she moved back to the community that she grew up in, that she decided to make the career change and work on the family farm.

Transitioning Back to the Family Farm

"It was really nerve racking at first moving from the classroom to the farm. I love learning and I knew I could learn everything I needed to know from my Dad, but I wanted to learn everything. I didn't just want to learn upper level jobs or work in the office. I learned how to change oil on the equipment, general maintenance to tractors. I



"The generational differences have helped the father-daughter duo complement each other on the family farm."

wanted the knowledge of how to do everything right and be able to do it myself," Jocelyn adds as she reflects on her transition.

There are many individuals who can come back into the family business who just want the management roles and don't want to work for it. Jocelyn wanted to earn the management role and show she was capable of handling the tough jobs, too. It was that need for being proficient in all job duties on the farm that has helped Anderson gain the trust and confidence from others involved in the agriculture industry.

Gary isn't as fond of the paperwork or computer side of the business, which for Jocelyn, those tasks came easier for her to manage. The generational differences have helped the father-daughter duo complement each other on the family farm. She has helped advance the farm and huller with more technology to make processes more efficient, but she says it is a still a long road to come. "The huller is 16 years old, so slowly we will update and advance the technology, but it takes time."

Jocelyn said she just wanted to start by learning the basics but the biggest growth has been in her Dad and the two learning to work together.

Over the last four years, Anderson has moved from those basic learning steps to an assistant manager and learning how to manage the whole farm together. GSA Farms, grows almonds,



Jocelyn in front of walnut huller.



Gary and Jocelyn Anderson in walnut orchard.

walnuts, winter wheat, corn and alfalfa as well as operating a walnut dryer. Together, they make it all work.

All Hands on Deck

Harvest time of year is all hands-on deck, but Jocelyn said they manage to do it mostly in-house and don't generally have to hire much outside help. "We start almonds around August 1st and will be wrapping up almond pollinators about mid-September. That same time we are then getting the walnut huller going. We start with the Gillet walnut variety first, it's a UC Davis variety that is about 93 percent jumbo and a light-colored nut." It fits well in their businesses alongside Howards, Hartley and the largest variety Chandler.

They manage their 80-bin huller and walnut harvest between their six full time farm employees, her Dad and her. She manages the walnut dryer with some assistance from her Dad. "If we are getting ready to start drying, we talk about what bins and what lines we are using. While bins are filling up, I manage the walnut waste. Depending on the variety, time of year and weather the walnuts can be in the drying bins from 5-24 hours. We use natural gas dryers here on our dryer and they need to be checked periodically throughout the day and night. When they have reached eight percent, we can fill the trailers. Then in the morning we fill trucks for loads to head out to

processors and clean everything before the huller starts up again."

Jocelyn says her Dad ensures the overall process is running smooth not just in the huller but he checks the harvesters in the field. Gary manages the shakers, sweepers, conditioner,

pick up machines and all field harvesting. Jocelyn credits their smooth operations to their employees. "We trust the people who work for us. We all know what we are doing, and we know it well. Mistakes rarely happen." It

Continued on Page 24

ISOMATE® NOW Mist

FROM PACIFIC BIOCONTROL



The **Innovative** choice for Navel Orangeworm mating disruption in **ALMONDS, PISTACHIOS, & WALNUTS**

- **PHEROMONE** released during peak NOW flight hours
- **USDA** and **University** tested
- **REDUCED LABOR**, only 1 Mist unit/acre required for faster deployment
- **7 MONTHS+** pheromone release, helps to reduce overwintering populations
- **LIGHTWEIGHT**, easy to hang
- **NEW UNIT** every year

Reliable aerosol disruption from the **Trusted Leaders** in **Pheromone Technology**



PACIFIC BIOCONTROL CORPORATION
www.pacificbiocontrol.com

ISOMATE® is a registered trademark of Pacific Biocontrol

Christeen Abbott-Hearn
Central and Coastal California
559.334.7664

Jeannine Lowrimore
Northern California
209.603.9244

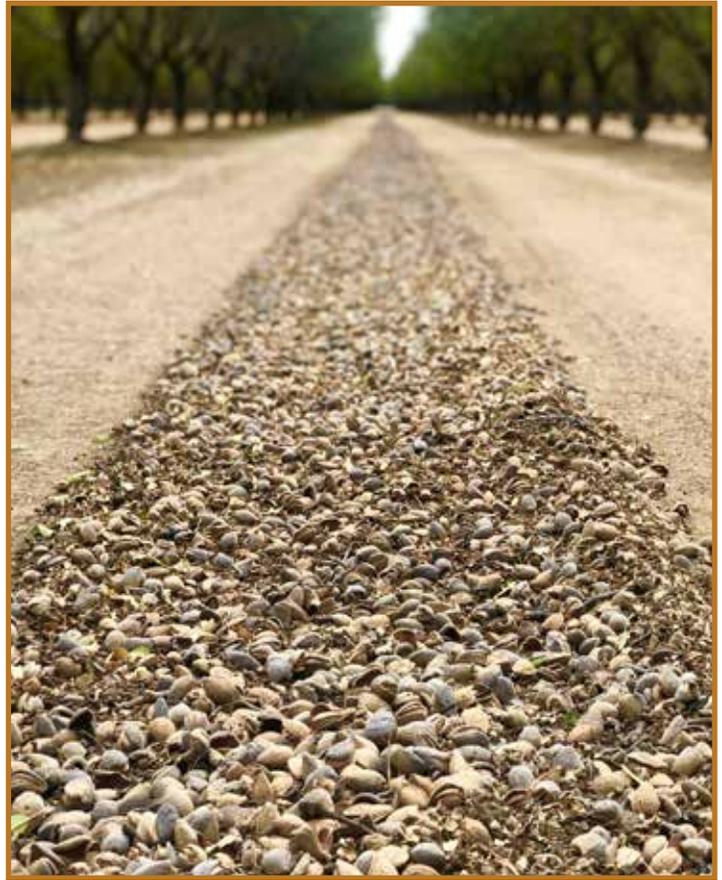
is the expertise of all members of the farm that make their business successful. She adds, “We aren’t just managing our product, either. We are handling other farmers crops as well. We have a solid foundation of team work and we care for each other and encourage each other.”

The most challenging part of farming, Jocelyn says is dealing with the regulatory changes. “Having to be able to incorporate and work with changes constantly is challenging. Whether that be produce safety guidelines, food safety rules, current procedures in place, safety training and documenting everything we do.” These are just added steps they have had to integrate into their processes and part of their business, but they do come with long hours and diligent work.

Harvest Goal

Their goal is to be done with walnut harvest by November 1st. Then it is time to clean the entire huller and all the parts to close it up for winter. After that, Jocelyn says you will find her in the office, “Catching up on getting bills out, end of year reports, nitrogen management plans, safety planning but I really enjoy the general care of the orchards over winter, pruning, keeping them clean, and just taking care of the trees.”

Anderson adds it is her love for farming that makes each



Windrow of harvested almonds.



POWERFUL PERFORMANCE. "KOOL" COMFORT.

The low, sleek New Holland T5 Series with the industry-exclusive KOOL CAB® is the ideal tractor to ease through orchard rows, protecting nuts and fruit, while also protecting operators in complete comfort. The 70 to 100-PTO-horsepower Tier 4-certified engines give you the power and performance you need for demanding work in rugged conditions. And, the KOOL CAB keeps operators at their productive best with these features:

- Ultimate visibility to front, side and rear—not found on most Orchard cabs
- This cab is ROPS-certified for operator safety—an industry-exclusive—and ISO-mounted to be vibration-free
- Outlet, cool and roomy cab design that's sleek and less than 91 inches
- Standard limb lifter sweeps limbs up and over the cab to protect valuable nuts and fruit
- The right horsepower for your demands—All with KOOL CAB comfort



Garton Tractor, Inc.
4780 South K Street
Tulare, CA 93274
(559) 686-0054
www.gartontractor.com

© 2014 CNH Industrial America LLC. All rights reserved. New Holland is a trademark registered in the United States and many other countries, owned by or licensed to CNH Industrial N.V., the successor of Fendt. ROPS Cab is a registered trademark of Fall-T-Cab Inc.

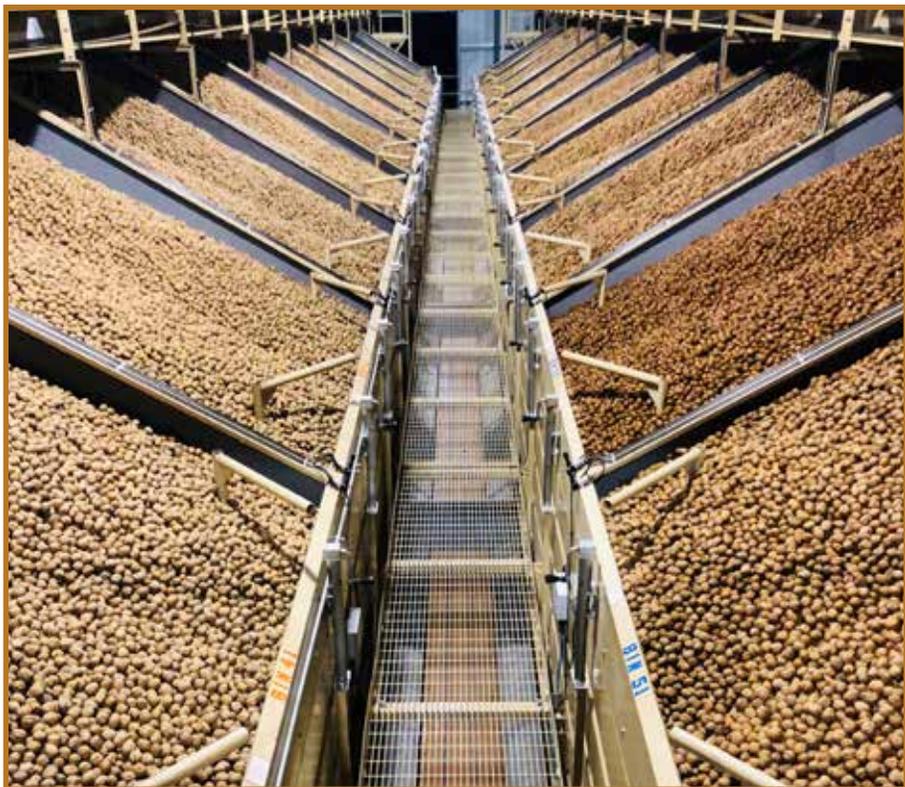


Windrow of walnuts.

“We aren’t just managing our product, either. We are handling other farmers crops as well. We have a solid foundation of team work and we care for each other and encourage each other”

day easy to come to work. She plans to fully manage the property and farm someday when her Dad is ready to work less and not be as involved. Jocelyn plans to help grow the business and expand the farm. Anderson is happy she made the switch in her career paths and claims, “It is the best decision I ever made.”

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com



Walnut bins drying in huller.

GET FIRST PICK!

Dave Wilson Nursery

2020 TREES AVAILABLE NOW!

ALMONDS **WALNUTS** **STONE FRUIT**

dwntrees.com | 1-844-DWN-TREE



Joy Hollingsworth shows soil. All photos courtesy of UC ANR.



Amer Fayed



Mohamed Nouri

Meet the New UCCE Farm Advisors

By CECILIA PARSONS | Associate Writer

Joy Hollingsworth

KINGSBURG NATIVE JOY

Hollingsworth is part of the 2019 crop of new University of California Cooperative Extension (UCCE) farm advisors. Hollingsworth was appointed in April as the nutrient management and soil quality advisor in Fresno, Kings, Madera and Tulare counties.

“Right now I am focused on meeting growers and assessing their needs,” Hollingsworth said. “One area will be helping growers with new environmental regulations.”

Hollingsworth said she is also planning directions for research. Most of her work so far has been in agronomic crops, but she said with the abundance of permanent crops in her area, she would be branching out and looking at ways to address grower needs. One of the first projects to surface, she said, is biostimulant use in raisin production. Biostimulation is a process that involves the modification of the environment to stimulate existing bacteria capable of bioremediation.

Prior to her new UCCE assignment, Hollingsworth was a staff research associate at the University of California (UC) Kearney Agricultural Research and Extension Center in Parlier. She

also worked as a junior specialist in the UC Davis Department of Plant Sciences where she designed and implemented agronomic field trials for canola, camelina, sugar beets and castor. Hollingsworth has a bachelor’s degree in communication and a masters degree in plant science from Fresno State.

Amer Fayed

As the new director of the Western Integrated Pest Management (IPM) Center at the UC Agriculture and Natural Resources (ANR) headquarters, Amer Fayed has some definite goals in mind.

“I want to promote adoption of integrated pest management as economically viable, sustainable and profitable for farmers,” Fayed said in a phone interview.

In an introductory blog on the Center’s web site, Fayed said he believes that while consumers want safe, high quality produce, they are unaware about agricultural practices and crop protection. There is a great opportunity for the Center to educate the public, consumers and regulators about IPM and that it can be a safe alternative to chemical pesticides, he said.

The promotion of integrated pest management will include

communicating the benefits and explaining the concept of IPM and its use in agriculture in terms that everyone can understand. Fayed said he also wants to strengthen linkages between the scientific community and growers to demonstrate how IPM strategies work in agriculture. These efforts will be in the form of outreach and training workshops for growers.

Another important function of the IPM Center will be continuation of data presentation to the public. This is vital, Fayed said, because the public funds the work at the center and needs to know how the money is spent. Presenting supporting data on research projects is one of Fayed’s goals. The Center will be awarding nearly \$250,000 in grants for one-year projects. Information can be found on the Center web site: wester-nipm.org.

Fayed joined the UC ANR as director of the Western Integrated Pest Management Center in July. He is a plant pathologist with research experience in identification, epidemiology and biological and molecular diversity of viruses. Before coming to the IPM Center, he was an associate manager at Virginia Tech and Africa program manager of the Feed the Future Innovation Lab for IPM. Fayed has a

bachelor's degree in agriculture and a masters in crop production from the American University of Beirut. He holds a doctorate degree in plant pathology, physiology and weed science from Virginia Tech.

Fayed said his plans for his first months as director will be to become acquainted with the partners and stakeholders in the Western region which includes Hawaii and Alaska. This is a huge region, he said, many commodity groups, IPM coordinators, scientists and Center co-directors. Getting to know all the people involved and determining the areas where the Center can make the most impact are big challenges.

Mohamed Nouri

New UCCE area orchard systems advisor Mohamed Nouri will be problem solving in a wide variety of fruit and nut crops.

Nouri, who joined UC ANR in July, said he is currently meeting with growers and assessing their crop production needs. He is based in San Joaquin County, a statewide leader in walnut and sweet cherry production. Other important crops in San Joaquin County and the surrounding area include almonds, apples, oil olives and grapes.

In this position, Nouri will be a regional and statewide extension leader, bringing together campus based academics, UCCE advisors and growers to work on crop production challenges.

Nouri, in a phone interview, said he would continue to focus on new and emerging diseases, and his goals as farm advisor is to develop a strong outreach and research program, and to work collaboratively to achieve positive and effective solutions that will secure a sustainable future for California agriculture and everyone who depends on it for healthy environment and healthy communities, today and especially for future generations.

Prior to joining ANR, Nouri worked for UC Davis as a graduate student and postdoctoral researcher at the Kearney Agricultural Research and Extension Center from 2015 to 2019. Working closely with UCCE specialists, UCCE

farm advisors, pest control advisers and farmers, Nouri studied fungal diseases of major fruit and nut crops, including olive, pistachio, sweet cherry, citrus, almond and grape. He oversaw the plant disease diagnostic services for perennial fruit and nut crops in California and management tasks for the laboratory.

Conducting his research in California, Nouri earned a Ph.D. in plant pathology from University of

Tunis El Manar, where he also earned an M.S. in microbiology and plant pathology and a B.S. in life and earth sciences. Nouri is fluent in Arabic and French.

Nouri is based in Stockton and can be reached at (209) 953-6115 and mnouri@ucanr.edu.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

OBLITERATE YOUR ALMOND & PISTACHIO MUMMIES
With the QUICK, EASY & EFFECTIVE

REARS MUMMY & STICK MULCHER

Get Rid Of Navel Orangeworms Quickly

Last Year's Crop Is Pulverized Effectively By Use Of Shear Bars And Crop Containment Features Built Into This Unique Sanitizing Shredder.

Before After

Midland Tractor

Contact Us Today
(559) 674-8757
1901 W. Cleveland Ave Madera, CA
midland-tractor.com

INCREASING EVIDENCE OF PACIFIC FLATHEADED BORER ATTACK IN WALNUT ORCHARDS IN CALIFORNIA

By JHALENDRA RIJAL | UCCE Area IPM Advisor, Merced, San Joaquin, and Stanislaus Counties

UC | University of California
CE | Agriculture and Natural Resources ■ Cooperative Extension

FLATHEADED BORER IS A larval stage of one specialized group of beetles (Insect family-Buprestidae). The name 'flatheaded' comes from the enlarged and flattened shape just behind the head of the larval stage (Figure 1) of the beetle (Figure 2, see page 29). The flatheaded borer species that has become a major issue in walnuts is Pacific flatheaded borer (PFB), *Chrysobothris mali*, which is known to present in the western states such as Washington, Utah, Oregon, California. A similar type of borer species causing serious damage in various nurseries and other fruit and nut trees in the eastern part of the United States is called Appletree flatheaded

borer, *Chrysobothris femorata*.

Although Pacific flatheaded borer has been an occasional pest of young fruit and nut crops in the past, in the last two years, this borer has become a wide-spread issue in several walnut orchards from young unbearing trees to mature and healthy trees. In the fall of 2018, PFB was reported as a major issue in walnuts. Several growers and pest control advisers reported the unusually high instances of flagged branches, dead twigs, and even 'canker-like' symptoms in tree trunks in San Joaquin and Stanislaus counties. We visited more than ten walnut orchards with various degrees of damage caused by this borer in the region. In addition,

we also received reports of the flatheaded borer attack in several walnut orchards from Sacramento and Southern San Joaquin Valleys as well. In the 2019 season, we have seen a high incidence of the borer infestation in walnut orchards especially young ones. In mid-September, we visited at least three walnut orchards that were under attack by the flatheaded borer. One of them is a one-year-old orchard, and the second orchard was a two-year-old. Both of these orchards had over 90 percent trees with flatheaded borer infestation in the trunk (Figure 3-4). The third orchard was a six-year-old orchard in which PFB attacked various parts of the tree (twigs, branches, limbs,



Figure 1. All photos courtesy of Jhalendra Rijal.

**SUTTER BUTTES
MERCANTILE LLC**

**MONTANA
TRACTOR & MACHINERY**

Offering Annual Contracts
Individual Payment Schedules
<https://www.facebook.com/sbmercantile.net>
www.sbmercantile.net

Custom Harvesting Available

**6188 Luckehe Rd.
Live Oak, CA 95953
530.846.5720**



Figure 2



Figure 3



Figure 4



Figure 5

and trunk, **Figure 5**). In general, based on two years of observations in various orchards, flatheaded borer infestation was found in both young (1-5 years) to mature (6-20 years) orchards irrespective of the walnut variety. There might be some differences in terms of susceptibility among common varieties (such as Howard, Chandler, Tulare), but none of them were found immune to the borer attack, at least based on field observation.

In many cases, growers were not aware of the borer attack on trees, which was not surprising as the flatheaded borer had never been a pest of the regular watchlist in the past. In general, the flatheaded borers are known to cause

damage to weaker, wounded, and sunburn-susceptible parts of the tree. This is still true that these trees are more likely to be attacked by the flatheaded borer; however, in our observation, the damage was not just limited to wounded and sunburn-damaged branches, and this trend of attacking healthy trees is very concerning. The damage was observed randomly within the orchard and even within the tree ranging from the small twigs (pencil-size), branches (two-four inches diameter), limbs to tree trunks.

Biology and Ecology

Pacific flatheaded borer belongs to beetle family 'Buprestidae,' the members

of which are also called "jewel beetles" or metallic-wood borers. There are over 15,000 known species of Buprestid beetles in the world today, and a majority of them bore into the stems, logs, leaves, and roots of various plants. Pacific flatheaded adults are 1/2 to 3/4 inch long with brown and gray markings on the wing covers, and have an oval head with the wedge-shaped body (**Figure 2**). Keep in mind that this borer can attack forest, landscape, and various other types of trees and has a wide host range. At least 70 tree species of 21 plant families have been reported as hosts that include alder,

Continued on Page 30



WalnutTek Advantages

- Walnut sorting at the huller, and in-shell
- Green and black re-sorting at the huller
- Several width options – 32, 48, 64 or 80in
- Capacity from 5-30 tons/hour

Automated Moisture Monitoring at the Dryer

All moisture meters are available for use individually or in conjunction with the WalnutTek sorter.

- Hand-held moisture meter
- Automated moisture meter
- Automated moisture meter with door control
- Automated moisture meter with door control and bin fill

AgTrack

- Traceability from the farm-to-processor



Woodside Electronics Corp.

1311 Bluegrass Place, Woodland, CA 95776
 Phone: 1-530-666-9190 • Fax: 530-666-9428
 Website: www.wecotek.com

Chris Sinclair

530-979-7633

16 Years in Walnuts | 30 Years of Sorting in the Field



OFFERING OVER
150 YEARS
OF WALNUT GROWING EXPERIENCE



Accepting
2021
tree orders
Enrollment

SEASON IS NOW OPEN
CALL US
TODAY
209.602.8394



Orestimba Varieties:

- CHANDLER • CISCO
- DURHAM • HARTLEY
- IVANHOE • FRANQUETTE
- HOWARD • LIVERMORE
- SOLANO • TULARE

Clonal Rootstock Available
RX1 VX211 VLACH



"Check out our Roots"



www.orestimbanursery.com
We believe in helping other
growers, GROW!
-Mark Crow

Continued from Page 29

birch, ash, ceanothus, oak, boxelder, mahogany, maple, poplar, sycamore, willow, apple, pear, beech, elm, cotoneaster, peach, plum, avocado, loquat, cherry, currant, fig, apricot, and walnut.

Life Cycle and Seasonal Phenology

Pacific flatheaded females deposit ~100 eggs singly in the potentially weaker portion of the wood (i.e., sunburnt, freshly pruned, etc.), bark crevices or depressions through which freshly hatched larva bore into the bark, feed on the cambium layer of the wood initially, but can reach to the heartwood eventually (**Figure 6**). The larvae are cream-colored and legless. They construct pupal chambers and molt into the final instar (i.e., prepupal stage) for overwintering in the late Fall. Pupation occurs in the spring and early summer, and the adult emerges. There is one generation per year, but the life cycle may be longer (1-3 years) in cooler areas, as reported in some literature.

We did not have any information about the seasonal phenology of this insect in walnuts in California when we discovered the epidemics of this pest last year, but this year, with the funding support from the California Walnut Board, we did a small study in which we collected infested branches in the winter, and the beetles were reared out from that collection. Based on that preliminary, we found that the majority of the beetles were emerged in mid-June, with the emergence continuing for two months, May-June. The emergence timing can vary from year to year based on potential factors such as variety, temperature, locations, drought conditions, etc., and we need more research to understand various factors that might influence the seasonal emergence and borer incidence in orchards.

Insect and Damage Symptoms Monitoring

Although literature suggested that adults may be seen on sunny sides of the tree trunk during the summer, we never spotted adult beetles in our field visits and observations. There have been precedents of using large-sized (2-feet long) purple or green sticky traps (**Figure 7**) to capture other buprestid adults such as invasive species-Emerald ash



Figure 6



Figure 7

borer. However, these traps were never tested against Pacific flatheaded borer in the past. Since finding the optimal trap type is critical to study the emergence pattern of this beetle, we are now testing these traps for their potential use in walnut orchards. We used both green and purple sticky traps and purple funnel traps in the 2019 season, and we were able to capture Pacific flatheaded borer adults in all trap types based on preliminary information we have, and we will continue to explore options to optimize these traps for improved monitoring of this pest.

At this time, it is recommended for all walnut growers to pay a little close attention to walnut trees, and find out whether flatheaded borer is causing damage in the background given the fact that flatheaded borer damage may not be obvious in the beginning years, as other factors (e.g. disease) may produce similar types of external symptoms including flagged branches, dead twigs, etc.

Continued on Page 32

WALNUT

HULLING & DRYING EQUIPMENT



CONTACT US
TODAY
TO GET A QUOTE
FOR THE BEST
PRICES

- Aspirators
- Rock Tanks
- Wash Belts
- Picking Tables
- Complete Drying Systems
- Pre-Cleaning Belts and Destickers

- Hullers
- Conveyors
- Fans and Burners
- Receiving Pit and Pit Elevators
- Special Self Cleaning Features
- on All Conveyors Standard



GROSSI
FABRICATION INC.



Serving the **California Walnut Industry** for over 25 years.

Custom Sizing to Fit Your Needs

Contact Us Today

3200 TULLY ROAD, HUGHSON, CA • Grossifabrication.com

209.883.2817



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12

Continued from Page 30

The following are the symptoms that can be used to confirm the presence of flatheaded borer infestation in walnut orchards.

1. Scout the orchard to detect dead and flagged branches infested by the flatheaded borer and look for external infestation signs (i.e., larval feeding wound, fresh or old insect frass, **Figure 8**).
2. Look for any visual wounds on tree branches and limbs that are prone to sunburn or have pruning or any kinds of cracks or wounds (**Figure 9**).
3. For young trees, check the damage on the trunk, especially on the south or west side of the tree as these sides are preferred sides for egg-laying by females due to more exposure to sunlight and heat. Also, check the graft union and pruning wounds closely.
4. Use a knife to peel the bark in a suspected branch and look for feeding channels packed with frass (saw dust-like insect waste) and cream-colored larva underneath the bark (**Figure 10**). Keep in mind that larvae tend to move into the heartwood in the late Fall for overwintering and therefore it can be harder to locate the larvae. Larval finds may be easier during June–August when feeding occurs in the cambium layer just beneath the bark.
5. Look for the brown color sap oozed out and spread on the bark surface of the infested branch or trunk of the tree. (**Figure 11**).
6. Look for D-shaped exit holes of the beetle on infested walnut limbs (**Figure 12**).

Management

Pacific flatheaded borer infestation may be reduced by adopting cultural practices that encourage vigorous, healthy plants, although the borer seems to attack healthy trees as well.

1. Young trees should be protected from sunburn by applying the white latex paint (1:1 paint and water ratio) or using mechanical covers over the trunk (e.g., trunk guard) as sunburnt tissue is more susceptible for borer attack.
2. Orchard sanitation—the removal of the weakened, injured, dead, and flagged branches are highly recommended during the winter as the mature larvae overwinter in the infested wood. Also, this will reduce the chances of reinfestation in the following spring.
3. Unfortunately, there is no insecticide registered to target flatheaded borer in walnuts, in California. Therefore, future research needs to investigate efficacy, timing, application methods of potential insecticide and other control methods to manage this pest effectively.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

LONG-LASTING + BURNDOWN CONTROL OF 51 TOUGH BROADLEAVES



Pindar[®] GT

HERBICIDE

Pindar[®] GT herbicide provides long-lasting control – up to six months – of the toughest broadleaves, including fleabane, marestail, filaree and malva. Plus, Pindar GT provides post-emergence activity on many winter and summer annual broadleaves, including fleabane and marestail. Commercial use has shown consistent performance across geographies, soil types and rainfall levels. For the strongest foundation in your residual weed control program, use Pindar GT herbicide.

Want to Thrive Postharvest? Make a Plan

By THE ALMOND BOARD OF CALIFORNIA

FOR AN ALMOND GROWER, PRACTICING postharvest irrigation and providing proper nutrients to the trees after the busiest season of the year is a way to “pay it forward” for next year’s crop.

By the end of September, flower formation inside the buds is coming to an end and next year’s crop yield potential is set. The principle is simple: greater flower development in the current season may result in greater return the following season. Taking care of those recently developed buds with good water and nutrient management will maximize next year’s fruit-set.

Like many things in life, preparation is key, and preparing your trees for the upcoming crop year requires that you make a plan to make it happen. Creating an irrigation and nutrient management checklist, for example, can help you ensure you’re taking the proper steps prepare your trees for life after dormancy.

Step 1: Reference the Almond Irrigation Improvement Continuum

In the fall, it is crucial that growers ensure their irrigation systems are working uniformly throughout their orchards, as the trees’ water needs are significant during this time and severe water stress can reduce next year’s bloom, fruit set and even yield. To avoid these consequences, growers are strongly recommended to reference an informative source aimed at helping them better understand irrigation management

Continued on Page 36

california almonds[®]
Almond Board of California

the Almond
CONFERENCE
2019

DECEMBER 10-12
Cal Expo, Sacramento

REGISTER AT ALMONDCONFERENCE.COM

PUT YOUR ALMONDS TO BED WITH THE RIGHT NUTRITION.



HIGH PHOS™

Apply High Phos as Part of Your Post Harvest Fertilizer Program.

A balanced formulation of essential nutrients containing organic and amino acids to stabilize the nutrients and facilitate their chelation, uptake, translocation and use.



For more information visit wrtag.com, or contact Joseph Witzke at (209) 720-8040

both postharvest and year-round: the Almond Irrigation Improvement Continuum. The Continuum provides a wide-ranging look at a grower's site-specific irrigation system with the goal of improved efficiency and effectiveness.

This resource, developed by the Almond Board of California (ABC) in partnership with respected technical experts, provides a step-by-step explanation of irrigation management and scheduling practices related to the following concepts:

- Measuring irrigation system performance and efficiency
- Estimating orchard water requirements based on evapotranspiration
- Determining applied water
- Evaluating soil moisture
- Evaluating plant water status

Tom Devol, senior manager of Field Education and Outreach at the Almond Board, and specialist Ashley Correia are both available to help almond growers assess their irrigation systems and help determine potential issues with achieve optimized water efficiency. To schedule an in-orchard visit, growers can email Devol at tdevol@almondboard.com or call at (209) 343-3231.

Step 2: Step Back and Assess Need for Fall Nitrogen Application

Once you triple check that your irrigation systems are

performing properly, it is time to evaluate your trees' need for a nitrogen (N) application in the fall. Applications of N postharvest may be necessary to meet your trees' N demand; however, there are instances when N applications are inefficient and unhelpful.

In the following situations, N applications are not needed:

1) Trees are already adequate in N levels per July/August leaf analysis: Leaf analysis is one of the best indicators to determine N status. If the July leaf N value is higher than 2.5 percent, a fall N application is likely not necessary.

2) There is a sufficient amount of N available to supply the trees' demand: If you want to have a better indication of your soil's N levels, consider conducting a soil sample. If you choose to do so, make sure to draw your sample from active roots and closely follow laboratory protocols.

3) Tree health is suboptimal when you plan to apply N: This may be the case if, for example, your trees are too stressed during harvest or will be too stressed postharvest due to dry down, water limitations, salinity, etc. Trees in suboptimal health will likely have very few leaves in the canopy and those leaves will look yellow.

Applying N when your trees have poor health conditions, or when your trees and soils already have sufficient soil levels, will likely result in N loss through leaching or gaseous losses. N loss subsequently brings little to no benefit to flower development.

Step 3: Consider Boron, Zinc Sprays

Postharvest is also a good time to consider nutrient uptake through the trees' leaves via foliar applications. There are two key micronutrients to consider: boron and zinc.

Boron (B) plays a key role during flowering as it promotes the elongation of the pollinic tube, therefore promoting fruit set. Maintaining adequate B in your tree buds is especially beneficial during bloom. However, too much or too little B will have the opposite effect—reduced fruit set.¹ Growers must ensure, therefore, that B is only applied if needed. The adequate range for B is 60-160 ppm (parts per million), and B will likely not need to be applied if levels are at the upper end of this range.

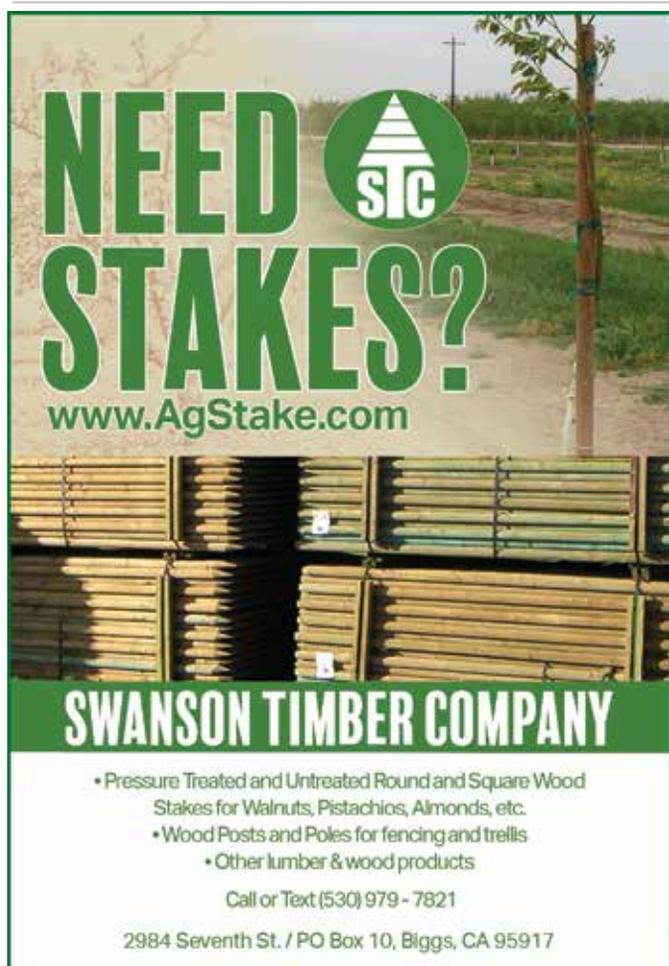
Growers often apply large amounts of zinc sulfate spray in the fall to improve tree Zinc (Zn) status. However, while a fall Zn application may be beneficial to control rust inoculum by promoting leaf drop, research shows that this application does not increase the Zn concentration in trees. In fact, new findings suggest that Zn uptake in trees mostly occurs when Zn is applied in early spring.²

For more information on nutrient recommendations and critical ranges, visit Almonds.com/Nutrients and UC Davis' Almond Nutrients & Fertilization page, found at FruitsandNuts.UCDavis.edu/AlmondPages/AlmondNutrientsFertilization/.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

¹Nyomora, A.M.S., P.H. Brown, and M. Freeman. 1997. Fall Foliar-Applied Boron Increases Tissue Boron Concentration and Nut Set of Almond. *Journal of the American Society for Horticultural Science*. 122:405-410.

²Saa S., C. Negron, P. Brown. 2018. Foliar Zinc Applications in Prunus: From Lab Experience to Orchard Management. *Scientia Horticulturae* 233: 233 -237.



NEED STAKES?

www.AgStake.com

SWANSON TIMBER COMPANY

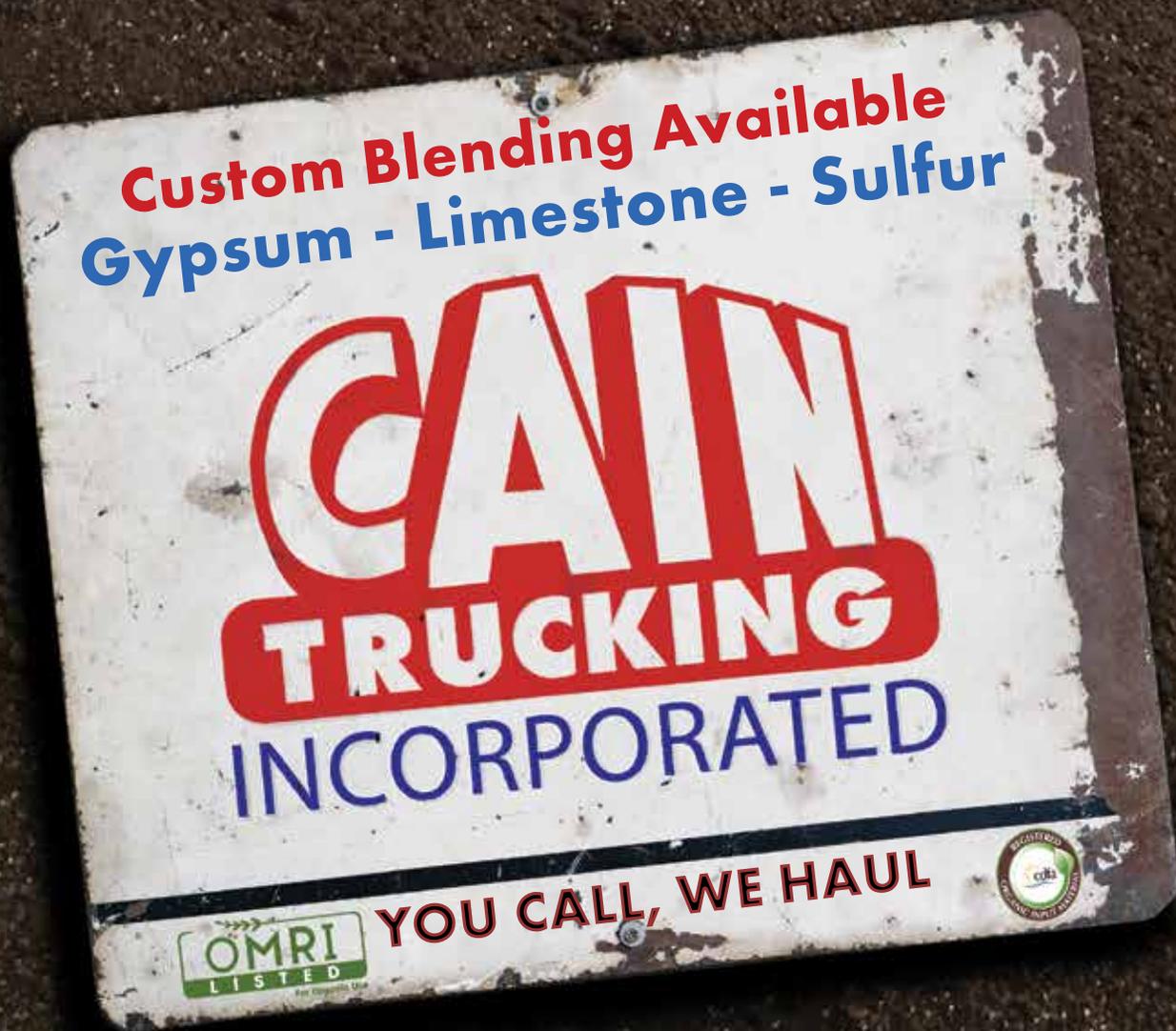
- Pressure Treated and Untreated Round and Square Wood Stakes for Walnuts, Pistachios, Almonds, etc.
- Wood Posts and Poles for fencing and trellis
- Other lumber & wood products

Call or Text (530) 979 - 7821

2984 Seventh St. / PO Box 10, Biggs, CA 95917

COMPOST

100% Fully Composted Dairy Manure
The Leaders in Dairy Compost Manufacturing



Servicing the Valley since 1925

559-686-5707

What can Cain do for you?

Ask us about our **Dust Control** and **Fertilizer** Products.

Harvesting Strategies to Reduce Dust

By CECILIA PARSONS | Associate Editor

All photos courtesy of Cecilia Parsons.

A CLEAR VIEW TO THE VERY end of a row of trees, just a few rows away from operating harvest equipment, showed how seriously California's almond growers are taking their industry's efforts to reduce dust.

Dust Reduction Goals

Purchase of harvest equipment designed to generate less dust, harvest strategies to reduce dust and grower

efforts to minimize dust in sensitive areas are all attempts by almond growers to meet 2025 dust reduction goals sought by Almond Board of California (ABC). The goal, set in 2018, is to reduce total harvest dust by 50 percent.

Air quality, particularly during late summer, can be negatively impacted by dust generated during almond harvest. Sweepers and pick up machines

operating in orchards can create significant amounts of dust and contribute to high levels of particulate matter in the air. To address this issue, Almond Board of California has funded research over the last ten years to develop a number of methods growers can implement on their operations to reduce the amount of dust generated and improve air quality during harvest. The San Joaquin Valley Air Resources Control Board and Natural Resources Conservation Service have also offered incentive programs to help growers with the purchase of equipment designed for dust reduction.

Sebastian Saa, Senior Manager of Agricultural Affairs at The Almond Board said,

"Our industry has made great strides in reducing dust over the years. While

THE SAN JOAQUIN VALLEY AIR RESOURCES CONTROL BOARD AND NATURAL RESOURCES CONSERVATION SERVICE HAVE ALSO OFFERED INCENTIVE PROGRAMS TO HELP GROWERS WITH THE PURCHASE OF EQUIPMENT DESIGNED FOR DUST REDUCTION.

WINTER SANITATION

Do your floors look like this?



Look for our premier California dealers in:

KERN
MACHINERY
Bakersfield, CA
Buttonwillow, CA
Delano, CA

LAWRENCE
TRACTOR
Visalia, CA
Hanford, CA
Tipton, CA

MAC'S
EQUIPMENT
Kerman, CA
Tranquility, CA
Madera, CA

N&S TRACTOR
Colusa, CA
Dos Palos, CA
Merced, CA
Stockton, CA
Turlock, CA
Willows, CA
Yuba City, CA

RED BARN
Modesto, CA



800.204.3122 | www.nwtiller.com



this progress is important, though, we're even more excited about what's to come as we invest in research to propel us to the next level and help the industry achieve the Almond Orchard 2025 Goal to reduce dust during harvest by 50 percent."

Dust Reduction Machinery

One almond grower taking advantage of ABC's research is Samuel Ghilarducci of Shafter. As the end of his Nonpareil harvest approached in early September, he watched as the pickup machine made passes through the orchard. The sandy ground in that orchard makes dust reduction more difficult, he said, but machinery designed to reduce dust combined with smooth, clean orchard floors does make a difference in the amount of dust generated.

"We normally couldn't be this close to the machinery when it's running, no closer than eight to ten rows. There is dust, but it's not spread out like it could be," Ghilarducci said. This was his second harvest with a pick up machine designed to reduce dust generation. He estimated that dust coming from his orchard harvester during harvest was reduced by 70 percent.

The harvest dust levels would be much higher, he said, but the pick up machine, an Exact Corp 3800, picking up his windrowed almonds, has a moisture injection system and a wafer brush drum to scrub the fine dust particles from the air stream before it is released from the machine.

"This is what we have instead of dust," Ghilarducci said, picking up small mud balls from the ground after the machine passed by. "The brushes act like a sponge and catch the dust."

The Exact machine carries a 120-gallon water tank that empties in about three and a half hours depending on the soil type in the orchard and age of the trees.

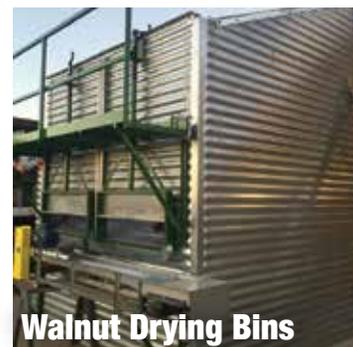
Trent Goehring of Kern Machinery said the machine operator could adjust the pressure on the pump to match field conditions. The operator's skill can also make a difference. If the pickup head is set too low, more dirt will enter the machine. As the nuts are moved along the cleaning belt, twin rods drop excess dirt, keeping it from going into the

Continued on Page 40

Kraemer & Co. Mfg., Inc.

Nut Drying & Storage Facilities

Almonds • Pecans • Pistachios • Walnuts



Walnut Drying Bins

- Burners
- Fans
- Drying Systems
- Storage & Handling
- Custom Manufacturing
- Spiral E-Z Let Downs
- Installation & Service



- Bin Features
- Knock Down Kit
 - Modular
 - Corrugated / Galvanized Construction
 - Do-It-Yourself Option
 - Low Lead Time
 - 6 Ton Capacity

*Let Kraemer & Co. Design
and Build the Facility
that is Right for Your Needs*

3778 County Road 99 W
Orland, CA 95963
530-865-7982 | Fax: 530-865-5091
CA Cont. Lic. #485-547 | Web: www.kcomfg.com



Trent Goehring of Kern Machinery in Bakersfield explains how the moisture injection system and the wafer injection system help remove dust from the air stream.



Wasco area almond grower Sam Ghilarducci holds the mud balls left on the orchard floor after a pass by the Exact 3800 pick up machine. The moisture injection system and wafer brush drum scrubs the fine dust particles from the air stream and binds them, leaving small balls of mud behind.

Continued from Page 39

reservoir cart. Goehring said that depending on the condition of the orchard floor and the size of the windrows the harvest machine can run at two and half miles per hour.

The machine operator and speed of the machine are also factors in dust reduction. ABC's research showed that small adjustments throughout the harvest season would cut down on the amount of dust generated. Ghilarducci confirmed that smooth, hard floors go a long way towards minimizing dust.

Dust Reduction Research

Almond Board of California's research in dust reduction has yielded several strategies growers can use to reduce dust during harvest. Clean orchard floors and eliminating ruts and holes where nuts can get stuck will help eliminate extra passes. Adjusting equipment heads higher knocks unnecessary dust out of the process without the loss of harvest efficiency.

Ghilarducci said the harvest crew also plans routes so they are not blowing dust outside the orchards. With an orchard across the street from an elementary school, he said they plan harvest outside of school hours and place signs along the road to warn about dust. Drivers also plan passes so that dust is blown back into the orchard where it can be filtered out by the tree canopy.

Sweeper heads can also be set to churn up less dust. The heads should not be set any lower than necessary to make windrows. Wire tines can be set as high as a half inch off the ground and still do the job. Tines set too low not only move more dust into the air, but can dig into the orchard floor and create ruts.

The conditions in the orchard should dictate the sweeper settings. Extra attention should be paid to blower spout adjustment and fan speed. The spout should be angled to move only nuts and not the soil. Reducing the fan speed can minimize dust and save fuel.

Incentive Program

The San Joaquin Valley Air Pollution Control District's





Almond growers also place signs near harvest operations to warn motorists about possible dust.

Board of California research studies requested by the air district. The first study established emission factors for reductions of dust from new harvesters sold by the four major equipment manufacturers in the almond industry. The second surveyed the industry to develop an understanding of the existing harvester fleet and determine

interest in a new incentive program that provides funding to support the purchase of low-dust equipment.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

incentive program supports the purchase of qualifying harvesters to reduce particulate matter emissions by at least 40 percent. Goehring said the air district program can assist growers with 50 percent of the eligible equipment costs. The district program caps at one piece of new equipment per participant and is open to both growers and custom harvester operations for the purchase of any qualifying pull behind or self propelled equipment. If the purchase of a pull behind harvester is made, it must be used in combination with at least a Tier 3 engine tractor.

Those who receive funding from the air district for the replacement projects are not eligible for Natural Resource Conservation Service (NRCS) funding in a similar program, but the district does not have adjusted gross income caps. Ghilarducci was able to take advantage of the NRCS program last harvest.

The low dust incentive program follows completion of two Almond



LET YOUR TREES TELL YOU WHEN TO IRRIGATE



CONTROL

Real-time feedback of tree stress levels in each orchard, plus all other field parameters

IRRIGATION PLANNER

Know when and how much to irrigate based on patented tree stress prediction technology



DIRECT TREE SENSING FOR TREE STRESS CONTROL

System components

-  Tree sensors
-  Satellite imagery analysis
-  Irrigation monitoring
-  Climate modeling
-  Soil moisture monitoring

Contact us at phytech.com and we'll put you in contact with California growers using the Phytech system so you can hear about its benefits directly from your peers.

WITH SB1 IN THE REAR-VIEW MIRROR, CALIFORNIA CAN NOW LOOK TOWARD THE FUTURE

By **MIKE WADE** | Executive Director, California Farm Water Coalition, Contributing Writer

Voluntary Agreement projects will be similar to efforts like this Turlock Irrigation District stream bed restoration on the Tuolumne River. All photos courtesy of Turlock Irrigation District.

WE APPLAUD GOVERNOR Newsom's veto of SB1, legislation that would have blocked efforts aimed at finding collaborative solutions to water supply and ecosystem challenges. He chose to calmly focus on the long-term rather than get caught up in the politics of the moment, which is often difficult. But it's critical because what's at stake is nothing short of California's water future.

Voluntary Agreements

Now that the path is clear, the Voluntary Agreements (VAs) on water can move forward. These agreements represent a completely new way to manage our water supply and environment because they are cooperative efforts between all water users including farms, cities, conservationists and rural communities.

The process of developing a framework for the VAs is close to completion. According to a July update letter by California EPA Secretary Jared Blumenfeld and California Secretary for Natural Resources Wade Crowfoot, by mid-October they expect, "to have the modeling and scientific analysis nearing completion and the governance and adaptive management structure in close to final form."

Successful Projects

This is a significant achievement that has its roots in successful projects, like the Butte Creek Salmon Recovery Project, that began decades ago. The Butte Creek project, launched in the 1990's with the involvement of President Bill Clinton's Interior Secretary Bruce Babbitt, was an early experiment in farm, urban and environmental water users cooperating at the local level to come up with new ways to solve old problems. Butte Creek's holistic and cooperative approach turned fewer than 100 returning salmon in the 1970's into what is now an average annual return of more than 10,000. This and other successful local projects spurred on today's larger-scale Voluntary Agreements.

These agreements, just like Butte Creek, rely heavily on current science



PBM Supply & MFG., INC.

Quality Agricultural Spray Equipment, Parts and Supplies
www.pbmsprayers.com www.pbmtanksupply.com

-Sprayers- -Tanks- -Liquid Delivery Trailers- -Parts & Accessories-

Chico - 530-345-1334
 324 Meyers St. Chico, CA 95928

Yuba City - 530-671-0068 - **New Store Location!**
 955 N. George Washington Blvd. Yuba City, CA 95993

Fowler - 559-834-6921
 3732 S. Golden State Blvd. Fowler, CA 93625

Murrieta - 951-696-5477
 41648 Eastman Dr. Murrieta, CA 92562



HAV Self Propelled Sprayers



Walking Beam Sprayers



Mixing Trailers



Injection Pumps



Parts, Tanks & Accessories

which is constantly revealing smarter ways to manage our water and our environment. And unlike our existing regulatory system, the Voluntary Agreements will employ adaptive management, allowing us to utilize continuously updated science as it becomes available.

It is also of major significance that annual funding will make all of this a reality. Farm and other water users will be putting hundreds of millions of dollars towards ecosystem and water-flow projects. In addition, Governor Newsom and the legislature recently set aside \$70 million in the 2019-2020 fiscal year state budget for habitat restoration actions and other measures for the Voluntary Agreements.

Water Supply Reliability

With these agreements water users large and small will gain much needed water supply reliability. Farmers are agreeing to redirect water to benefit salmon and other species in return for better reliability so they will know what and when they can plant. Urban and rural users will also benefit from increased reliability rather than constantly wondering if today's forecast will bring additional restrictions on usage. It is this supply reliability that makes it possible for water users to provide all the environmental benefits embedded in the VAs.

And while all sides are at the table, certain environmental representatives are now saying the current set of proposals don't go far enough to protect the environment, a possible reaction to the governor's SB1 veto. Hopefully that will change and we can take ourselves out of the endless cycle of lawsuits that has been the hallmark of our existing regulatory system. Once finalized, the VAs can begin producing results today, not 10 years from now.

Thanks to the efforts of Governor Newsom, Senator Dianne Feinstein, and many others, both past and present, the Voluntary Agreements are near completion and will fit well with the Governor's Water Resilience Portfolio.

They represent a great step forward

for California and we welcome the participation of everyone who is ready to roll up their sleeves and make the VAs work for California's people, farms, wildlife and our environment.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com



SAVE THE DATES

Register TODAY: www.wcngg.com/register



January 10, 2020 Co-hosted by: 
Yuba-Sutter Fairgrounds
442 Franklin Ave, Yuba City, CA 95991

- Trade Shows/Free Events
- CE Credits Offered
- Seminars & Workshops
- Networking
- Free Industry Lunches
- Free Coffee & Donuts
- Cash Prizes

NORTH VALLEY Nut Conference

In conjunction with the UCCE Butte/Glenn/Tehama Counties Almond & Walnut Day

 University of California
Agriculture and Natural Resources Cooperative Extension

January 21, 2020
Glenn County Fairgrounds,
221 E Yolo St, 95963 Orland, CA



Powered by:  **MARKETING** WEST COAST NUT
AG MARKETING SOLUTIONS
Progressive Crop Consultant 

 @jcsmarketing  JCS Marketing Inc.  @jcs_marketing

COMPOST

Ask Us About:

LIQUID COMPOST

LIQUID CONCENTRATED COMPOST

FEATURING:

- Stable and nutrient rich source of organic matter
- Pathogen Free
- Weed Free
- Rich in Micro-organisms



Office: 559-686-3833 Fax: 559-686-3833
2904 E. Oakdale Ave. | Tular
newerafarmservice.com



Foliar Products

NUTRA-MIX I

A liquid formulation of essential plant nutrients designed to help supplement a well-balanced crop nutritional program. A combination of all organic materials used to aid in early cell development and vigor, during periods of active plant growth.

NUTRA-MIX II

Comprised of all organic materials used to aid in early cell elongation and maturity, during periods of crop development.

METAZYME

A high energy metabolic plant stimulant. Small amounts can stimulate the plant's metabolism, increasing nutrient uptake and movement within the plant. Metazyme is a natural chelating agent, the amino-organic acid compounds may stimulate growth or in higher applications can shift the metabolic sync from vegetative to reproductive growth.

Also ask us about:

**LIQUID
NUTRA-MIN**

LIQUID SEAWEED



Soil Amendments

LIQUID R/S

A soluble extract derived from composted dairy manure that has gone through a thermophilic controlled biological oxidative process plus humic acid derivatives, seaweed extract, yucca schidigera, cane molasses. It can be applied to the soil, metered through irrigation systems, and applied to foliage. New Era Root Stimulant has been shown to stimulate better root systems that can increase the efficiency of applied and existing nutrients

MICRONIZED NUTRA-MIN

A naturally occurring mineral formed when ancient plant and sea life was subject to eons of Hydra-Thermal reactions. It contains almost all of the known macro and microelements in trace amounts.

BIO-BLEND R/S

A non-manure based soluble extract blend of beneficial microbe, enzymes, humic acid derivatives, colloidal clay minerals, seaweed extract, yucca schidigera, and cane molasses. New Era Bio-Blend R/S can be applied to the soil, metered through irrigation systems, or sprayed on foliage.

MICRO-SOFF

An organic-acid liquid formulation of Citric and Humic acid derivative blends. It has a pH of less than 2.5, which can help buffer high pH and sonic soil conditions. Ideal for helping to clean drip systems. It is safe to handle, does not burn. After 90 days it will break down leaving short-chain sugar carbons which can help stimulate biological growth.

951-686-1453
Redlands, CA 93274
www.newera.com

CDFA INTRODUCES NEW FARMER RESOURCE WEBPAGE FOR FARMERS AND RANCHERS



September 24, 2019

SACRAMENTO, SEPTEMBER 23, 2019-

The California Department of Food and Agriculture (CDFA) is pleased to announce the availability of the new Farmer Resource Portal designed to assist farmers and ranchers by increasing access to information to help farming operations. The portal is available here:

<https://www.cdfa.ca.gov/farmerresources/>

This webpage is a “one-stop shop” for farmers and ranchers to find information about available grants and loans including programs that prioritize funding for socially

disadvantaged farmers, beginning farmers, female farmers, veteran farmers, and urban farmers. Additionally, there is a list of quick links to information to help farmers and ranchers better understand CDFA regulations and policies.

“It is my hope that this site will be utilized by farmers, ranchers and the groups that work with them,” said CDFA secretary Karen Ross. “Most of the information was already available, but this portal makes it simple and easy to navigate, and it keeps all of the key information in one place.”

The Farmer Resource portal was developed under the tenets of Assembly Bill 1348 (Aguilar-Curry), the Farmer Equity Act of 2017. This law requires CDFA to ensure the inclusion of socially-disadvantaged farmers and ranchers in the development, adoption, implementation, and enforcement of food and agriculture laws, regulations, policies, and programs.

The Farmer Equity Act defines a socially-disadvantaged group as one composed of individuals that have been subjected to racial, ethnic, or gender prejudice because of their identity as members of a group without regard to their individual qualities.

There are a growing number of socially-disadvantaged farmers and ranchers in rural and urban areas, and CDFA’s Farmer Equity Advisor is working to ensure that these farmers have a voice in policies and programs that affect their livelihoods, as well as increased access to information and resources for their farm operations.

The webpage includes links to new Spanish-language CDFA social media handles, press releases in English and Spanish, and in the future will also have an interactive California map of technical assistance providers who can assist farmers, including assistance in various languages. This will be a valuable resource for farmers who need assistance in languages other than English.

This webpage is just one way that the Farmer Equity Act is being implemented at CDFA. In January 2020, CDFA will submit a report to the Governor and Legislature on efforts to serve socially disadvantaged farmers and ranchers and female farmers and ranchers in California.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

An advertisement for R-Agent DL. The top half features a photograph of a farmer in a white shirt and hat operating a green tractor in a field. The text is arranged in a structured layout with yellow and orange backgrounds.

Bring the heat on hard-to-kill weeds and insects with

R-Agent DL™
d-LIMONENE ADJUVANT

100% Active Ingredient!

Spreader-Activator with Citrus Extract

R-Agent DL® dramatically boosts performance.
Use R-Agent DL with and without oil on agricultural, turf, ornamental, and non-cropland sites.

For more information:
email: tom@chemurgic.net
Tom Kelm: 559 696-6558

Distributed by
CHEMURGIC
Chemurgic Agricultural Chemicals, Inc.
P.O. Box 2106 • Turlock, CA 95381

- Adjuvants
- Nutrients
- Organics
- Formulation Services

www.chemurgic.net

WE WILL PUMP YOU UP

WITH OUR MYCORRHIZAL PRODUCTS

STIMULATES ROOT GROWTH

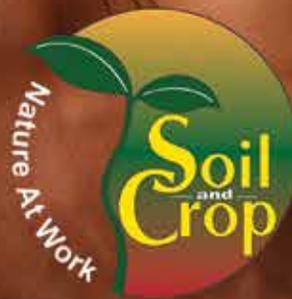
IMPROVES DROUGHT
TOLERANCE

REDUCED TRANSPLANT SHOCK

IMPROVES EARLY GROWTH

IMPROVES SOIL STRUCTURE

LESS FERTILIZER REQUIRED



POWER UP YOUR PLANTS

Ask us about our other soil care products.

- BACTERIAL INOCULANTS
- SOIL PRODUCTS
- BIOLOGICAL FOOD PRODUCTS
- MICRO NUTRIENTS
- FOLIAR NUTRIENTS

Contact Us Today at 1-800-279-9567

CALLNRG.COM



HONEY BEES, Small but Impactful

By JULIE R. JOHNSON | Contributing Writer

THE HONEY BEE MAY BE small in size, but the impact it has on agriculture is enormous. It has been reported the value of the European honey bee, *Apis mellifera L.*, to pollination services is estimated to be more than \$217 billion globally and \$20 billion in the United States annually.

In California alone, about one-third of agricultural revenue comes from pollinator-dependent crops.

In the world of nut crops, the honey bee is as important to the crop as the crop is to the bee. And no nut crop needs them more than California almonds. And likewise, no single crop matters more to beekeepers' bottom lines than the state's

almond pollination, which is reported to make up over a third of U.S. beekeeping revenues.

The critical role of the honey bee is well researched and documented at the E. L. Niño Bee Lab at University of California (UC) Davis. The Lab's stated goal is to "characterize biotic and abiotic stressors affecting colony health in order to inform development of immediate and long-term solutions for bees and beekeepers.

This message was the basis of a presentation by Bernardo Nino, bee lab researcher, during this year's Nickels Soil Lab Field Day. He discussed a grower's relationship with the beekeeper, Varroa research, and ways grower practices can

benefit bees and beekeepers.

Growers and Beekeepers

Beekeepers, also known as apiarists, utilize the natural population dynamics of honey bee colonies to produce honey and provide pollination services.

"If I were a grower, and knowing what I do about beekeepers, the ideal situation would be to have a longstanding relationship with a good beekeeper," Nino said. "Having a lot of communication with your beekeeper and having someone who is close to where your orchards are can be greatly beneficial for both the grower and the beekeeper."

This close proximity may even lead a

CALIFORNIA ALMOND
Pollination
SERVICE

HEALTHY BEES = HEALTHY YIELD

Quality pollination services from Red Bluff to Bakersfield.
Maximize the pollination process with healthy, strong and active hives.

We will help you increase your yields this year!

Strong, Healthy Hives

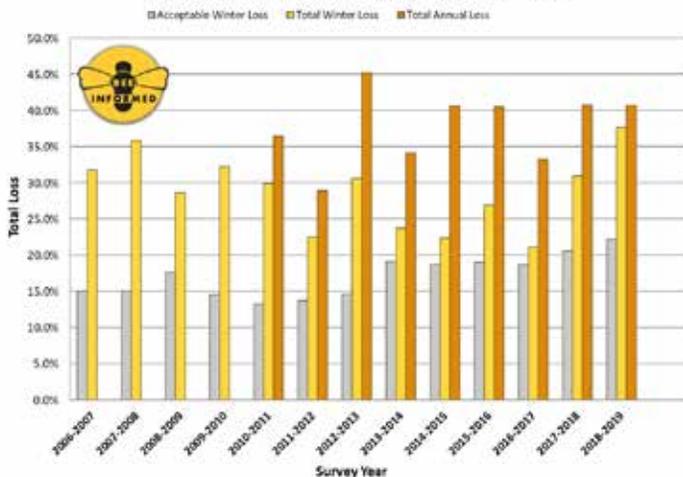
- Two-story "double deep" quality hives
- Detailed maps showing placements of hives
- Hive inspections throughout pollination season
- Strong 8-frame average plus hives
- Extra hives in case of emergencies
- More than 30,000 hives available

almondbeepollination.com

Contact Us Today!

Steve 209.202.8915 or shousebee@gmail.com **Lele** 209.404.2651 or lelemachadohicks@gmail.com

Total US managed honey bee colonies Loss Estimates



Preliminary 2018-19 Bee Informed Partnership Colony Loss and Management Survey results: The Bee Informed Partnership is a collaboration of efforts across the country from some of the leading research labs and universities in agriculture and science to better understand honey bee declines in the United States. Supported by the United States Department of Agriculture and the National Institute of Food and Agriculture, the partnership is working with beekeepers to better understand how to keep healthier bees. The key to their success is the true partnership they maintain across a wide range of disciplines including traditional honey bee science, economics, statistics, and medical research that makes all these tools available to this important research. They work with leading researchers in the honey bee industry, advisory boards from the commercial beekeeping industries, almond and other commercial growers, as well as naturalists and conservationists from across the country. Graph courtesy of Bee Informed Partnership.

beekeeper to give the grower a discount as it reduces transportation stress of the colonies and saves on mileage costs.

“However, that can’t be the situation for everyone,” Nino added. “So, how do you get the bees in your trees?”

There are other options, he explained, such as brokers, like Pollination Connection. He said a grower can go online and type in the words “pollination and broker” and be able to come up with a broker company.

“For instance, if I were a beekeeper in Texas, I might send all of my hives to California in October and not worry as I pay a broker to both take care of them, which at that time of year would be feeding and treating, and finding contracts with growers,” Nino said. “As an example, let’s say I’m a grower, I need to find the right broker, tell him I need 10,000 colonies in my orchards and the broker can take care of me because he is managing 40,000 hives for a beekeeper out of Texas.”

In this type of situation, a grower is once-removed from direct contact with the beekeeper, and will really have to trust the broker, and in turn, the broker will really have to trust the beekeeper.

“There are a lot of different contracts out there,” he added. “I have been amazed at the variety and nuances in details and numbers. It is a very personal decision for the grower.”

With so many honey bees colonies being transported from out-of-state into California for pollination purposes, transportation stress can result in a 5-10 percent loss just on the truck, Nino said.

“There are so many variables that can take place before the bees make it into the orchard in January and February,” he added. “That in turn can cause stress between the beekeeper and the transporter, then to the broker, and on down the line from the broker to the grower.”

Honesty and integrity is another reason for a grower to have a good relationship with a broker or beekeeper.



A group listens to the presentation of Bernardo Nino, bee lab researcher at the E.L. Nino Bee Lab at UC Davis, at the Nickel's Soil Lab Field Day. Photo courtesy of Julie R. Johnson.

“A grower needs to be able to know for surety that the colonies he is receiving into his orchards is exactly what he contracted for,” Nino explained. “As is any business, there can be unscrupulous people out there. For instance, as a beekeeper, if I was less scrupulous, I could do some manipulating of the hives and make it look like an eight-frame colony, when it isn’t. And you may unfortunately even have an inspector who only cracks the lid, and grades it as an eight frame.

However, if it doesn’t have the proper frames of brood, if the

Continued on Page 50

Connect your farm operation.

Simplify record keeping, manage block-level profitability, get complete traceability.



 **conservis**

209-232-5882 | Conservis.ag

demographics are off, then it's not going to work your trees like a normal colony."

Nino said such is very seldom the case and the vast majority of beekeepers do all they can to provide the best quality product to their growers.

"Otherwise, they would have few repeat customers," he added.

The world of a beekeeper is menacing enough, with so many things that can go wrong and do go wrong, that the relationship they have with the grower is as important to them as it is to the grower.

"Let's say, in November a beekeeper is working to equalize hives and at the same time really trying to communicate with the grower concerning his numbers, and keeping his fingers crossed that nothing adverse happens to his colonies from Thanksgiving through New Years," Nino said. "And then it is a mad dash for the beekeeper to try and get the actual numbers, which is very difficult to do, then communicate those numbers to brokers and growers with the hopes nothing wrong happens in the meantime. It is perilous for everyone involved due to the critical role of the honey bee in the success of the crop."

Bee Threats and Stressors

Honey bee colony loss rates have almost doubled to 28 percent since the early 2000s due to a combination of stress, pests, diseases and pesticide exposure, according to research reports.

Along with moving colonies from place to place, lack of forage, cold weather and exposure, there is the threat to the hives of the Varroa mite, a parasite that transmits viruses and lowers bees' immune systems. It is about the size of a basketball on a bee, comparatively, and is a physical hindrance which is more so when colonies are in stressful situations.

According to the Nino Bee Lab, Varroa destructor mites were first found in the USA in the late 1980s. They made their way from Asia, evolving to specifically reproduce on the European honey bee and devastating the U.S. beekeeping industry.

Varroa mites are still considered to be the number one ectoparasite of honey bees. Colonies that have high Varroa mite numbers (above the three percent

threshold) late in the season are highly likely to die over the winter season, reports the Lab.

Beekeepers have a limited number of options for managing these mites and these include hygienic bee stock, host-parasite biology manipulation, and varroacides. Chemical treatments present a particular challenge as Varroa mites can quickly develop resistance and some treatments can be harmful to bees if not properly applied.

Nino said, "Bees have a tendency to drift and lob, and so pollination is like summer camp for bees, where for them it's like 'oh look, a bunch of hives and we can share our diseases and be super close.' You have a lot of stress on the bees at that time of year and stress can lead to pests and disease."

In the Nino Bee Lab, Nino is joined by researchers Elina L. Nino, Christina Torres, Robin Lowery, Nissa Coit, and Gehrig Loughran, in an ongoing project working with several entities and supported by the IR-4 Project to evaluate and develop a new soft chemical for managing Varroa mites in a manner safe for the bees.

Thus far the researchers have evaluated several new products or new formulations of existing products, and while they can't divulge details the report, there are several good prospects.

Research

Nino said one of the areas of research concerns the question of colony frame size and what stocking rates work best for pollination.

"The question remains, while a four-frame colony is not going to be able to do the work of an eight-frame colony, however, if I have a four-frame colony out there with a 12-frame colony as well, is that just as good as having two eight-frame colonies, or even better? We are going to use two hives per acre as a minimum, and try to discover if using two four-frame colonies equals the work and outcome of one eight-frame colony," he added.

Current research, Nino said will be critical when trying to evaluate a year such as 2019, a year beekeepers did not have good, strong bees as they have had in the past, and they are still trying to figure out why—was it from pesticide exposure, the mite levels and viruses.

"It has been really hard to define and explain why a colony didn't perform well or even died," Nino added.

He said one thing they have done in the lab is to investigate the ideal supplemental forage.

"The Almond Board of California and Project Apis M are working with us to evaluate orchards, for example that might have a mustard field next to it in comparison to an orchard with just bare ground around it," Nino stated. "So what we found is, hives that were placed in mustard-bearing orchards had higher strength of about three frames of bees in December, which is huge for beekeepers, and could be the difference of being able to make the required numbers for contracts, or not. We found that we had fewer hives die that were in the orchards with mustard."

Planting mustard is just one of the things, he said, that growers can do to help the beekeepers, and in turn help themselves. It is a low investment for the return.

"There have been voiced concerns that if a grower plants mustard, then the bees are only going to work the supplemental planting and not work in the trees," Nino explained. "The research has shown that is not the case, that it in fact synergizes the bees and you have more effective pollination because you have created habitat for some of the other pollinators."

He said growers can plant the mustard in orchard rows or in a separate field.

"Some growers have reported planting in a nearby walnut orchard to leave their almond orchard clean," Nino added.

Another project Nino said he is involved in concerns stationing cameras in front of colonies to study activity in the hives and at the same time counting bees on the trees to answer the question of "what is the traffic of the colony equal to the work that is being done in the trees on warmer, sunny days compared to colder days."

"From my data, the bees are really shutting down around 2 p.m. in the trees, even on warm days, although the activity in the hives continues to be busy until later," he said.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

NEW

Multi-Target Navel Orangeworm Monitoring Systems for conventional and organic tree nuts

FOUR STAR — 2020 LINE UP!

WE ARE READY TO SUPPORT YOUR NOW MONITORING NEEDS!

PHEROCON[®] MONITORING SYSTEMS

Male Attractant System: PHEROCON[®] NOW L² Lure



- Male NOW Attractant High/Low-Release Pheromone Lures

Female Attractant System: PHEROCON[®] IV NOW



- Female NOW – Oviposition – Attractant, Concentrated, Stabilized lures

NEW! Predator Detection System: PHEROCON[®] PREDATOR[™] Trap



- Detect mite predators, such as the Six-spotted thrips and Stethorus beetles
- Based on the Great Lakes IPM trap
- Used in recent university trials
- May be used as a treatment threshold indicator
- Contains easy hanger

Note: Apply miticides based on UC-IPM Guidelines

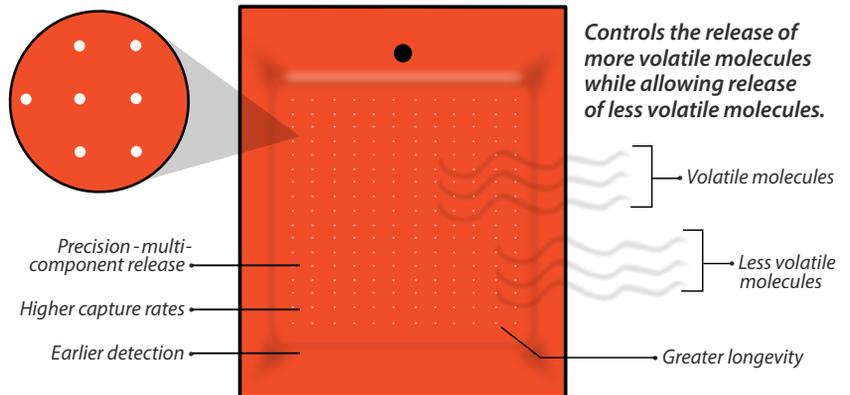
NEW! Multi-Gender Attractant System: PHEROCON[®] NOW PPO-HR L²™ Lure



- Multi-Gender NOW Attractant, High-Release PPO-HR L²™ Microporous Gel™ Peelable Lure
- More information below

- Multi-Gender Quick-Change™ with expanded hang tight spacer
- Multi-Gender NOW Attractant, High-Release PPO-HR L²™ Microporous Gel™ Peelable Lure
- Duplicates Standard USDA vial release rate
- 12 weeks field longevity
- Easy to use; ready-to-use barrier pack

NEW! Multi-Gender Attractant System: PHEROCON[®] NOW PPO-HR L²™ Lure



*Patent pending

Contact your local supplier and order now!

Visit our website: www.trece.com or call: 1-866-785-1313.



INSECT PHEROMONE & KAIROMONE SYSTEMS

Your Edge – And Ours – Is Knowledge.

Increasing Yields and Reducing Inputs

By RICH KREPS | CCA

IN FARMING, WE ARE ALWAYS STRIVING TO produce two outcomes: Increasing yields while reducing input costs. Of course, that's much easier said than done. A couple years ago, after presenting a budget to a farmer, I received a common response: "Rich, It's not always what you make, but what you save that matters..." Well, that only makes sense if you have already maximized your production. Let's dive a little deeper into that math.

Increasing Yields

Let's say a farmer makes a 2000 pound almond crop. At an arbitrary price of \$250 per pound our gross yield is \$5000 per acre. That's simple math. Now let's look at two different scenarios: Farmer Bill spent \$1000 per acre to get that yield. Farmer Bob spent \$1200 per acre to produce his nuts. Both farmed about the same with their inputs and timing. Obviously, Farmer Bill made \$200 per acre more profit. What if they can increase their yields to 2500, 3000 or even 4000 pounds per acre? If both farmers are at max capacity of 4000 pounds per acre and Farmer Bill spends \$200 more per acre than Farmer Bob it is definitely imperative that he find a way to save \$200. But only if he can stay at 4000 pounds.

Solid Postharvest Program

Now let's change the playing field. What if spending a little more can dramatically improve yields?

1) Farmer Bill goes into 2020 with a solid postharvest program in 2019 calculated off July tissue tests to see where he was short. He times his applications to make sure his calcium (Ca) inputs aren't over applied and followed too closely with phosphorus (P) inputs. The early focus is on soluble applications of Ca to feed the trees and ionic adsorption to actually offset sodium, not just help with water penetration. Plant ready P gets applied at rates a plant can actually take up and not lock up extra free lime or insoluble calcium over winter. Sodium leaching fractions are improved. He sprays his insufficient minor nutrients upstairs with properly buffered applications adding a shot of P for energy. K (potassium) can be added to assist in moving carbohydrates to the roots for winter storage. Studies have shown growers realizing as much as a 7:1 improvement over a ground application of iron, for instance. Compost and any other major soil amendments are applied after the trees have been fed. Biology and organic matter increase over winter as he incorporates them into his soil. A cover crop is planted to greatly increase green manure and organic matter. Next spring, the cover crop is mowed and weed control is greatly enhanced. Water penetration and retention is improved, soil



ULTRA GRO
Ag is Life

Ultra Gro, LLC is an employee-owned company based in Madera, California. Experts in agronomy who take a comprehensive approach with our growers, we manufacture and distribute a full line of proprietary liquid fertility products direct to the farmer. Our Ultra Gro products have proven to provide high yields, top quality and cost-effective results in both permanent and annual crops throughout the West. We have 20 crop nutrition consultants on our team with an aggregate of over 300 years of experience.

FIND OUT MORE ON OUR NEW WEBSITE

ultragro.com
or give us a call at 559.661.0977



nitrogen (N) assimilation is increased, soil carbon is increased and pest pressure lightens. That pest control budget can be reduced. Extra organic matter in the soil chelates more nutrient inputs and keeps them in the root zone with deeper aerobic activity. Healthier plants secrete more root exudates, soil biology improves and flourishes. Nutrient assimilation increases again. Yield goes up. Let's say it's only a 10 percent improvement per year for three years. Farmer A spent an extra \$150 per acre in calculated inputs and \$100 per acre in extra labor. A 10 percent improvement gets him to 2200 pounds in 2020, 2420 pounds in 2021, and 2662 pounds in 2022. At the same price of \$2.50 per pound he grossed \$18,205 per acre. His expenses went up a bit to \$3750 over Farmer B for the three years. His net return was \$14,455.

2) Farmer Bob does the exact same thing he has always done expecting the same yields he has always realized. (Because Albert Einstein warned us, "Doing the exact same thing over and over again and expecting different outcomes is the definition of insanity", we should avoid that thought process). He spends \$1200 per acre every year and nets \$15,000. His inputs were still \$3600 so he netted \$11,400.

That's an extra \$3000 per acre over the three years. However, I don't consult for any one acre farmers. On a small, 40 acre farm like mine that's an extra \$120,000 in three years. My clients with 1000 acres or 5,000 acres ramps things up to \$3,000,000 and \$15,000,000 respectively. I don't know about you but to me, that's nothing to sneeze at.

There's No Guarantee

Here's the rub: No one can actually guarantee you a specific year over year increase in yields. Mother Nature throws us those curve balls we spoke about in a previous article, the state can reduce our water AGAIN, pest pressure can ramp up in a crazy cool, wet spring, and markets can fall. We get it. Manure happens. However, just doing the same thing over and over again will almost always average out to the same yields we've always seen. Can we improve

yields by 10 percent by doing things differently and more deliberately over the course of a few years, absolutely. Healthier trees may produce more yields. Healthier trees will definitely receive less pest pressure according to a conversation I had with a great entomologist, Dr. Joel Siegel. The benefits of increasing soil biology and organic matter may have much more significant and lasting soil health increases. As water gets more expensive and less available, increasing the soils holding capacity and flocculation will be a huge benefit. That water savings could be the biggest of all in California. Maybe 10 percent is even a low expectation.

It's important to note, the human eye can't see a 10 percent difference in an orchard hanging in the trees. But that same human's eye can definitely see a fatter wallet when his yields go up! Pay yourself for your efforts by being smart. We've heard the old adage of

"It's important to note, the human eye can't see a 10 percent difference in an orchard hanging in the trees."

"work smarter not harder". As hard as farmers work, we have to be focused on that motto. Saving more money can be a great benefit to increasing profitability on a farm. But maximizing yield every year will put much more money in your pocket over the course of an orchard's lifetime. We plant a finite resource. Make sure you're maximizing it.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

FALL TILLAGE SALE

\$2000 OFF List Price for 2019 Sales

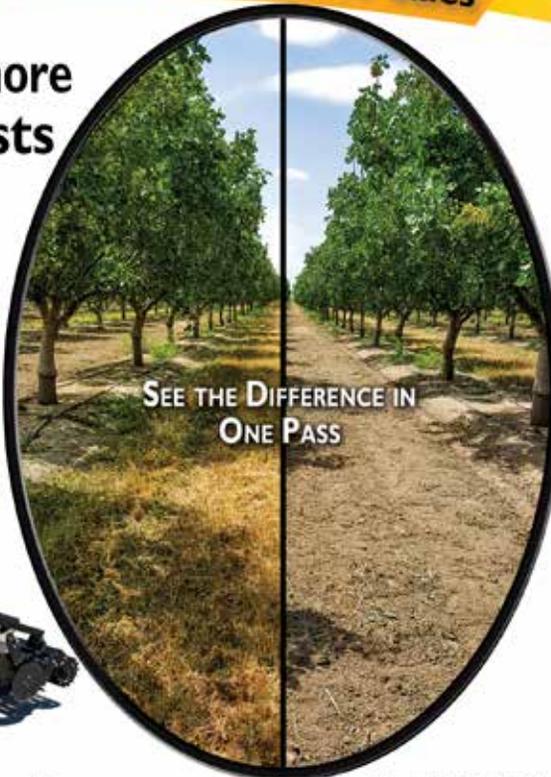
Save 50% or more
on time & costs

Uproot weeds.
Put mummies under.



Multiple sizes for
orchards and vineyards.
Sign up for a free demo or
no-risk rental!





SEE THE DIFFERENCE IN
ONE PASS

VISIT WWW.ORCHARDDISK.COM OR CALL (866) 663-8455

Farm Spotlight: *Burroughs Family Farms*

By CRYSTAL NAY | Contributing Writer



Ward Burroughs stands in a cover crop of mustard. Mustard cover crops provide many benefits to an orchard or field. All photos courtesy of Benina Montes.



SATAKE

Satake **EVOLUTION** **RGB+Shape** and **MIR** optical sorters utilize full-color, shape, and multispectral infrared (InGaAs) technology to achieve the highest level of foreign material detection and removal for the tree nut processing industry.

Contact us for a **free sort test demo** using your product at our full service test facility in Modesto, CA.

 www.satake-usa.com | (209) 551-3203



LIKE MANY OF THE FARMS in California's Central Valley, Burroughs Family Farms is the current iteration of a generational legacy spanning all the way back to the early 1900's. A humble start as milk delivery service in the East Bay soon grew to a dairy, then a move to the Valley allowed for expansion. Three generations and 1,100 acres in, what was once the old way of farming is now becoming new—organic and regenerative.

Transitioning to Organic

“We were conventional farmers up until 2000,” says Benina Montes, owner and manager of Burroughs Family Farms. “We farmed almonds conventionally, but used compost and manures to fertilize the trees.”

Growing up around beef cattle, dairy, and almonds, Montes was familiar with a cyclical agricultural structure, but her family partnership was interested in ways to diversify the almond aspect of the farm. At the time the family was becoming interested in organic farming practices, Montes's brother was

Continued on Page 56



The best way to manage pathogens before they become an issue.



TriClor is chloropicrin based and can be used as a standalone or as a complement to Telone® depending on your orchard redevelopment needs. When targeting soil borne disease and nematodes, TriClor and Telone® can be applied in a single pass. This reduces application costs, promotes early root development, and improves soil health. For more information about TriClor or to schedule an application contact TriCal, Inc.

TRICAL, INC.

669-327-5076

www.TriCal.com

*TriClor and Telone are federally Restricted Use Pesticides.

beginning a dairy on virgin ground. Since the land hadn't been sprayed, they decided to go organic from the very start, using this endeavor both as a tool for education and diversification.

"We were open to being educated, and we saw that going organic wasn't scary. So, in 2006, we started transition of our first block of almonds," says Montes.

The differences became obvious to the family farmers. The organic block became greener, the trees didn't look stressed, and certain pests weren't present.

When Montes became pregnant, she didn't want her children or herself exposed to the harsh chemicals of a conventional farm. She also didn't want any of her employees exposed to such chemicals, either. "We got rid of all the chemicals and decided we would just figure out something else. The more we learn and see the positive results of organic/regenerative farming practices, the more we are committed to them."

2015 was the first year the entire farm was certified organic.

Regenerative Farming

Burroughs has taken their organic operations a step further by implementing regenerative farming practices. After attending industry conferences that made note of negative environmental changes, the Burroughs team realized steps could be taken on the farm to help combat these changes.

"We have choices," says Montes. "In agriculture, we need to stay positive for each other, but there are differences in how we farm, and if someone chooses to do it differently, that's okay."

Transitioning an orchard isn't necessarily easy, and farmers run into bumps along the way. For Burroughs Family Farms and many others, it's about making the numbers work and not losing too much in production during the transition process. According to Montes, it has to be part of a workable balance, where money continues to come in so

farmers can continue to employ their staff, which in turn continues to keep the farm functioning and organic methods intact.

Labor

As farm manager of Burroughs Family Farms, Nick Hibma knows exactly how important this is. Organic farming simply requires more physical labor. "In today's climate, with the lack of labor in general, getting the number of people necessary to cover the ground in an organic setting can be a challenge," says Hibma. "Conventional guys are able to come in with a spray, cover the ground, and not be back on it for several months." But Hibma and his crews are out in the field frequently in order to maintain the orchard.

Research

Financial feasibility also allows for continued access to information. While the Burroughs operation does conduct trials in their own orchards, Montes is acutely aware that there just isn't as much research funding in organic farming as there is in conventional farming, especially in crops harvested off the ground as opposed to directly from the trees.

Pest Control

Aside from the financial aspects, pest control is a top-ranked topic in the industry in general, and, therefore, especially piques interest when discussing organic practices. Erring on the side of prevention, Burroughs does dormant spray, uses compost tea, and is working on biologicals, but also greatly supports habitats for beneficial insects. Planted all around the ranch are either native or blooming plants. "We try to have something in bloom every day, so that those beneficial insects always have somewhere to go," says Montes.

As for the usual suspects, like navel orangeworm, Hibma stands behind the farm's aggressive winter sanitation program. After harvest, the team goes back through to shake remaining nuts from the trees, sweeps them to row centers, and mows to kill the pest. "Winter sanitation is first and foremost—and the absolute key—to prevent navel orangeworm populations," says Hibma.



When maximizing your harvest is all that counts...

It's best to choose your shaker wisely.

Since 1990, we have hand-crafted our tree shakers with precision technology.

Orchard-Rite® tree shakers are engineered, assembled and serviced by people who have a vested interest in your success.

Experience pure performance when you harvest with an Orchard-Rite® tree shaker.

Three Reasons an Orchard-Rite® Tree Shaker is Your Best Choice:



HydraShake™ operating system offers a faster delivery and customizable rate of power, allowing for a concise powerful shake so the operator can shake more in less time.



AccuShake™ uniformly shakes the orchard using variation in shake timing and engine speed, clearing trees faster and easier than before.



WetHead® cooling and lubrication system, featuring Shurflo® electric injection system.

Orchard-Rite

Pure Power. Pure Performance. Pure Orchard-Rite.

PACIFIC DISTRIBUTING INCORPORATED

Authorized Distributor of Orchard-Rite® Tree Shakers

559-564-3114 | orchard-rite.com



Burroughs Family Farms discovers a dramatic increase in earthworm populations after transitioning to organic farming practices.



Cover crops help to protect the soil, suppress weeds, and provide habitat for beneficial insects.



Ward Burroughs checks the compost. Compost is applied to the orchard as part of the fertilizing program.

Benefits of Organic

Another challenge of organic farming is the lack of overall information. The shortage of research means a little more legwork from farmers, like making sure they have the proper reports from farm advisors, and keeping track of additional paperwork.

But to Montes, and the entire Burroughs family, it's worth it for a number of reasons. They know they are caring for natural resources, and that their practices are ensuring cleaner air, water, and soil. "I don't have to worry as much about my own kids being out in the field," says Montes.

The organic-approved sprays that are used are much softer products than conventional pesticides and insecticides, and are safe for beneficial insects. The fields are no-till, so the grass and cover crop is left to grow, and then simply mowed and left to break down and cycle back into the soil. Weeds are also managed with mowing and without chemicals. The farm is irrigated using drip irrigation, and the fertilizer program includes dried poultry litter applied in the fall, Biologically Enhanced Agriculture Management (BEAM) compost, farm-brewed compost tea, and cover crops.

There has been a boost in natural, healthy activity in the orchards, including beneficial microbes, birds, and more. (While digging to look at the soil in the first and second years of transition, the Burroughs team happily found three times as many worms.) Hibma, whose curiosity into regenerative farming ultimately landed him at Burroughs, is glad to see the increased interest in this method, and the expansion of cover crops, bee programs, and compost. "Farmers can't just push, push, push, and keep taking from the orchard without expecting to put something back into it. You have to have that life cycle that goes with it."

Montes agrees. "It's such a sign of life."

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

PROUDLY SERVING NORTHERN & CENTRAL CALIFORNIA SINCE 1990

CALL US TODAY!
(530) 891-5545



FAMILY OWNED
AND OPERATED

NORTH STATE
DRILLING

LIC # 812678

NORTH STATE
ELECTRIC & PUMP

LIC # 534959

— WATER WELL DRILLING — — LOCAL SALES & SERVICE —

AGRICULTURAL

NEW & USED PUMPS

COMMERCIAL

MOTORS & CONTROL

MUNICIPAL

WELL DEVELOPMENT

DOMESTIC

REHAB & REPAIR



WELLINDUSTRIESINC.COM | MEMBER OF BOTH CGA & NGWA | 3282 HIGHWAY 32, CHICO, CA

CHURCHILL FELLOW VISITS OREGON DURING GLOBAL HAZELNUT EXPEDITION



Jim Goodpasture guided Cannon on a tour of Goodpasture Farms, one of the oldest orchards in Oregon. Photo courtesy of Oregon Hazelnut Industry Office.

By THE HAZELNUT MARKETING BOARD

GLOBAL HAZELNUT PRODUCTION is amid an era of change, expansion and discovery, and one young Briton is traveling the world to chronicle it. Tom Cannon was chosen as a Winston Churchill Memorial Trust fellow, a rare honor that has afforded him the opportunity to travel the world and compare hazelnut production strategies.

His worldwide journey brought him to Oregon in September to learn how American farmers manage their orchards.

Third Generation Hazelnut Grower

Cannon is a third-generation hazelnut—known as a cobnut in the United Kingdom (UK)—farmer in Kent, a county on the southeast coast of Great Britain that is home to most of the country's hazelnut industry. The family manages 100 acres of hazelnuts, along with a diversified berry enterprise; Cannon recently launched an online store for the family farm that enables them to fill and ship custom orders direct to consumers.

“Our cobnut industry has a long history, and I am keen to make sure the sector grows into the future. As in the USA, nut consumption is becoming more popular in Great Britain, so a domestic industry is important,” Cannon said. “In addition, my grandfather set up the Kentish Cobnut Association (KCA) and helping to contribute to that and the entire sector is a privilege. I am on the KCA committee, so I am keen to bring back ideas and best practice.”

Hazelnut Growers Around the World

Cannon was very keen to see American

hazelnut farms, due to the level of innovation in the United States.

“The mutually beneficial partnership with Oregon State University is world-leading and very forward thinking. Although we eat most of our nuts green, we do want to develop more value-added products, and I think there is a lot of crossover in terms of developed consumer markets wanting to buy more nuts. I also feel it is sensible to understand the impact of pests and diseases that we don't currently have,” Cannon says.

In addition to his two weeks in the United States, he also trekked across Turkey and China learning about their hazelnut industries.

“I have seen so much during the trip, from traditional hill farming in Turkey to new significant plantings in China. I have also seen numerous processing operations and a real range of hazelnut products. Consumption is different in all three countries. Hazelnut products are most established in Turkey; the sheer range and availability is impressive, while in China the luxury nature of hazelnuts seems very apparent,” says Cannon.

U.S. Hazelnut Production

While in America, Cannon met with industry leaders at all stages. He visited eight farm families, each one with variations on management practices. Trees ranged from new-growth orchards yet to produce any nuts, all the way up to some of Oregon's oldest trees in the south Willamette Valley. Cannon's largest areas of focus were irrigation, fertilizer practices and harvesting methods.

“From harvesting to processing and product development, I was particularly keen to see current practices and how it differs from our approach. For instance, we do not currently irrigate in Kent, and the rise of this as a practice in Oregon is particularly interesting. This could make a big difference in Kent, because much like Oregon, we are seeing drier summers.

After visiting the orchards, Cannon explored receiving stations and processing facilities—both of which also vary greatly from the UK methods.

His trip concluded with field visits and discussion with Oregon State University researchers in Corvallis and at the North Willamette Research and Extension Center. From the latest on weed management and irrigation to understanding how the new varieties were created and their unique characteristics, the research team shared their findings on all areas of orchard science.

Cannon returned to the UK after his visits in America; he will wrap up the entire project with a trip to Australia and New Zealand next March. Upon completion, Cannon will compile a report and presentation on his findings.

The Winston Churchill Memorial Trust was established following the passing of the former British prime minister. Contributions have been made to the fund throughout the years, and the program now sends 150 Britons on international missions, annually.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

Key Dollar Cab

Protecting Growers Since 1982

Introducing the Precision Fit 8 Cab (exclusive to John Deere)

- Ceiling Mounted Climate System
- Improved Serviceability
- Greater Visibility
- Roomier
- Quieter



"Celebrating over 35 Years of Orchard Cab Innovation"

www.KeyDollarCab.com

(800) 481-0876

Preventing Soil Erosion in Young Hazelnut Orchards

By DANITA CAHILL | Contributing Writer

SOIL EROSION CAN PRESENT an issue in young hazelnut orchards. Since a ton of soil per acre is only about the thickness of a penny, it doesn't take long to displace or lose a large quantity of topsoil. But according to Nick Sirovatka, acting state agronomist for Oregon Natural Resources Conservation Service (ONRCS), cover crops or conservation crops can help prevent soil erosion, as well as provide more nutrients and water to the tree roots.

"Before the canopy is over, there are different potentials for what you can do between the rows," Sirovatka said. To illustrate this, he put on a

demonstration during the Nut Growers Society Summer Tour at the Linn County Fair & Expo Center in Albany.

Demonstration

Sirovatka brought five samples from the North Willamette Research and Extension Center in Aurora, Oregon. All of the samples were from Willamette soil. Sirovatka pointed out that the samples were dried out, because they'd been taken two weeks prior, but still worked for the demonstration. The samples were:

- 1) Grass with above-ground irrigation.



Nick Sirovatka talks about five different soil samples. All photos courtesy of Danita Cahill.



Photos show the land where soil samples were taken.



Nick Sirovatka holds up a model with Styrofoam balls representing sand, silt and clay particles.



An overhead sprinkler waters soil samples in a soil erosion demonstration.

WALNUTS, HAZELNUTS, PECANS DRYERS

BIN FEATURES

- Knock Down Kit
- Modular
- Corrugated/Galvanized Construction
- Do-It-Yourself-Option
- Low Lead Time
- 6 Ton Capacity

Three images showing different views of a large industrial dryer bin. The top image shows the bin from an elevated perspective, the middle image shows the bin from a side angle, and the bottom image shows the bin from a low angle, highlighting its structure and capacity.

KRAEMER & CO MFG., INC

3778 County Road 99 W. Orland, CA 95963
Phone 530-865-7982 | Fax 530-865-5091
CA Cont. Lic #485-547

- 2) Grass in the tree row, chemically controlled.
- 3) A clover and grass combination. (Mow it every year, but leave the crop).
- 4) Flailed, no soil structure; an organic system with heavy tillage.
- 5) Naturalized system of perennial grass stands under the trees.

The samples were in metal trays with holes drilled in the bottom. Sirovatka set the trays up on a table at a slanted angle. He used an overhead sprinkler to water them for several minutes, representing rain. Clear plastic jugs hung under the samples to catch the run-off water and soil.

Sirovatka pointed out that there was no sample of flailed soil with branch prunings, leaves, etc... "That's more of what's found in established orchards,"

he explained, "and this demonstration is for newer, younger orchards."

While the sprinkler was running, Sirovatka showed a model with different sized Styrofoam balls to represent the largest to smallest particles of sand, silt and clay. Sand, which is 2 to .05 mm in diameter, was represented by the largest Styrofoam balls. Silt, which is .05 mm to .002 mm, was represented by the medium-sized Styrofoam balls, and clay, which is anything tinier than .002 mm, was represented by the smallest of the Styrofoam balls.

Demonstration Results

Once the samples were watered and the sprinkler turned off, Sirovatka, with assistance, removed the trays and flipped them over on a tarp.

Sirovatka removed the trays, leaving the soil exposed to show how much, or how little, the water penetrated, and to show how much root growth there was down into the soil, as well as how well

the roots held the soil together.

The small crowd that had gathered between the buildings at the Linn County Fairgrounds to watch the demonstration converged around the tarp to compare the results of the different soil samples. Some of the hazelnut growers knelt to feel the soil. The samples with the most root growth were also the ones most saturated with moisture. Sample 4—the bare soil—crumbled apart. It had the most soil run-off into the plastic jugs, and showed little or no noticeable signs of water penetrating through the soil to the bottom of the tray.

Roots Rule

As roots grow into the soil, Sirovatka explained, they protect and insulate the soil against breaking apart when a rain-drop hits it. Rain on bare soil can create

Continued on Page 62

OMRI LISTED
For Organic Use

KNOCKOUT NEMATODES
AND SOIL DISEASES WITH

ORGANIC
Fungicide & Nematicide

PRODUCT OF
HUMAGRO

PRO MAX
BIOPESTICIDE

No Residue

Increase ROI

GET DEMO PRODUCT

Visit: HUMAGRO.COM/WCN1119

rills and gullies from run-off. Roots of all sorts, even dying roots, Sirovatka said, form a structure and help prevent erosion.

Living roots do even more to help surrounding plants grow, beyond helping pull water down into the soil. Living roots produce sticky root exudate, which are the chemicals secreted by roots into the soil. These exudates create more nutrients and micronutrients for plant life. Roots work to help regulate the microbial community in their immediate vicinity, and help support beneficial bacteria, fungi and nematodes. The roots exude many different compounds to help the plant deal with stresses such as herbivores, as well as to utilize mutually beneficial relationship with other plants or animals (symbiosis). The chemicals that roots secrete also change the physical and chemical properties of the surrounding soil, or rhizosphere. As much as 20 percent of all photosynthetically-fixed carbon transferred to the rhizosphere happens through root exudates.

To get these beneficial roots into the soil of hazelnut orchards, there are two sorts of crop covers to consider: A conservation cover, which is made up of a perennial plant or plants; and a cover crop, which is an annual—let it grow, harvest it or not, then destroy it by tilling it under. Even the tilled root structure works to store and bind more carbon, helping hold water in soil.

Various Cover Crops to Consider

There are many different crops, both annual and perennial, that can be grown alongside hazelnuts. Jeff Newton, farm manager for Crimson West/Christensen Farms in McMinnville, Oregon, has experimented with many different crops between the rows of trees. He's tried wheat in the past, (not very successful) seed vegetables, such as dried peas (successful), several different varieties of clover, flax, and both annual and perennial grasses, with varying degrees of success. He's also grown stands of wild grasses. He's discovered that poa, an annual grass, while a scourge of a weed to most grass seed farmers, actually makes a great cover crop among hazelnuts. He's even planted poa (Greek for "fodder") on purpose from seed. Jeff did mention that commercially grown poa seed is not easy to come by.

Other grass crops to try include fine fescue and creeping red fescue. The seed can be a cash crop when the hazelnut trees are young. As the tree canopy grows over, the fescue may no longer provide a seed crop, but it can still provide benefits to the orchard. Growers do have to stay on top of growth by mowing the grass six to eight times a year. Leave the clippings in place to act as fertilizer. It will cut down on conventional fertilizer costs. The roots will help provide better soil, and hold the soil in place to protect it from water and wind erosion.

"We understand not every orchard is going to be able to do a row cover," Sirovatka said. He mentioned biochar, which can be used as a soil amendment. It's good for improving yield in plants that require high potash and elevated soil pH. Biochar helps reduce leaching of nutrients, and can reduce fertilizer and irrigation requirements.

Even stands of native grasses, either planted on purpose, or simply left to grow wild under young hazelnut trees—while not providing cash flow the way some cover crops might—will still provide that root structure for better soil health, as well as help prevent soil erosion.

Cover Crop Funding Available

Up to 100 percent of cover crop funding is available through the United States Department of Agriculture's (USDA) Environmental Quality Incentives Program to hazelnut growers in Marion, Polk, Washington and Yamhill counties. For more information, contact one of those county's USDA service centers. In Marion County, call Les Bachelor at 971-273-4816. In Polk County, contact Evelyn Conrad at 503-83703689. In Washington County, call Jessica Wells at 503-207-7949. And in Yamhill County, you can reach Thomas Hoskins at 503-376-7605.

OFFERING EVERYTHING YOU NEED IN AGRICULTURAL STAKES

- Douglas Fir Treated Tree Stakes
 - Wide variety of sizes
 - Economical Douglas fir
 - Individually graded for high quality
- Lodgepoles
 - For areas requiring extra staking
 - Standard sizes from 2" - 3"
- Post & Rail Fencing
- Bamboo stakes

We're Not Just Stakes Anymore

New product lines, same old commitment to service...

POLY FILM **SOIL** **SHADE CLOTH**

Scott Goldsmith:
(702) 568-2020



Visit us online at
sullivanandmann.com

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com



CALCIUM WHERE YOU NEED IT WHEN YOU NEED IT

Apply CaTs® during the dormant season for improved water infiltration and soil structure. The convenient liquid formulation of CaTs allows for easy calcium application ahead of winter rains. The 100% soluble calcium and thiosulfate works immediately in the soil by displacing sodium to flocculate soil colloids. Prepare your fields for next season with CaTs.

Learn more about CaTs on the Crop Vitality YouTube Channel.



SPEAK WITH YOUR CROP VITALITY SPECIALIST
EMAIL INFO@CROPVITALITY.COM
VISIT CROPVITALITY.COM
CALL (800) 525-2803

©2019 Tessengerlo Kerley, Inc. All rights reserved. CaTs® is a registered trademark of Tessengerlo Kerley, Inc.

Walnut Pest Management: Walnut Husk Fly & Pacific Flatheaded Borer

By CRYSTAL NAY | Contributing Writer

IT SEEMS THAT GROWERS ARE ALWAYS BATTLING

pests in order to protect their crops. While we looked into navel orangeworm and codling moth in the first part of this two-part series, this second part shines the light on walnut husk fly and the Pacific flatheaded borer. So just how concerned should a walnut grower be about these pests? They don't require equal interest, as one is more of a concern than the other.

Walnut Husk Fly

About the size of a housefly, and far more colorful, the walnut husk fly has one generation per year, in which female flies lay eggs beneath the surface of the walnut husk. The first sign of infestation is a point-sized, stinglike mark on the husk. And while it might initially be an easy miss, the husk will eventually show black marks as the eggs hatch and the maggots feed and destroy it. After feeding, the maggots drop to the ground, where they bury themselves inches below the surface, and pupate in the soil. While most will emerge as adults the following summer, some can remain in the soil for up to two years.

Walnut husk fly is a notable pest, but there are others that surpass it in terms of infestation and damage. Orchards that experience this pest are likely to see it every year. Even though most California walnut-growing regions have walnut husk fly infestation, not every orchard has it. The damage is often overlooked because of how the fly damages the nut—only in the husk. The nutmeats are generally protected and undamaged, but shells often show staining, which is a problem more for those who sell walnuts in-shell. However, moldy or shriveled kernels can be the result of infestation occurring early in the season.

“The practices that are in place can help keep walnut husk fly damage low, and the need for multiple insecticide use within the season has potential consequences that include cost and

impacting the natural enemies in the orchard,” says Jhalendra Rijal, PhD, Area Integrated Pest Management Advisor. This basically comes down to using insecticide that includes bait, which attracts the fly to feed on the very chemical that is designed to control adult flies before they can lay eggs. With proper timing, eggs laid within one month prior to harvest will not have time to mature.

There has been some discussion in the last two to three years about whether or not soils can be treated to prevent pupating insects from emerging. There's also been mention of alternative methods, like winter soil cultivation, wintertime insecticide options, or biologicals such as insect pathogenic nematodes, but these have ultimately not yet come to fruition. “It seems to be difficult, because the pupae are very well protected within the pupal case, and below a few inches of ground,” explains Rijal. With this being the case, more research is needed on these practices to ensure their safety and efficacy.

The walnut husk fly is identified by its signature dark-banded wings, bright yellow spot near the wing attachments, and greenish eyes.

Pacific Flatheaded Borer

On the other end of the spectrum is a pest that holds the attention of researchers and growers alike due to its sudden increase in numbers and damage. The Pacific flatheaded borer has a particular attraction to damage or injuries on trees, from sunburn or canker, to pruning cuts, freeze damage, or any other kind of wound.

This beetle lays its eggs in these damaged parts, and the larvae will bore tunnels beneath the bark and deep into the wood of the tree, where they pupate. When the weather becomes warmer, adult beetles emerge. This causes extensive damage to the tree, causing parts of mature trees—or entire younger trees—to die.

“Last year was a widely-spread issue, and this year seems to be a little more of a problem in certain areas,” says Rijal. “A critical factor found this year was significant damage found to the younger walnut trees in several orchards, in addition to mature orchards.”

While observing two walnut blocks of trees under two years old, Rijal found 100 percent of them with Pacific flatheaded borer damage, for a total of 350 acres. Another orchard of trees planted just this year was entirely infested with the pest, making the grower consider grafting every single one of his trees below the infestation damage in an attempt to save his orchard.

In observed trees that were six to seven years old, Rijal





discovered borer damage everywhere on the plant, not just the wounded areas, including the trunks, branches, and smaller limbs and twigs, and internal parts of the tree that had little to no sun exposure.

While it's known by researchers that something happened to cause the sudden increase in Pacific flatheaded borer populations—possibly including the previous drought years—it's still unclear what the deciding factors were. With help from the Walnut Board of California funding this year, researchers might now have more of a lead on the borer's previously unknown cycle.

Winter-pruned infested branches were collected and placed in plastic tubs, which were then placed outdoors,

where they received all natural light and temperature. Rijal waited for adult emergence. At the first week of May, adult beetles began to emerge and continued through June. "Knowing the borer's adult emergence—something we didn't know before—was new to this year's research," says Rijal. "We are also testing a few trap types to capture adult beetles. If found effective, we hope that growers will be able to use these traps for flatheaded borer monitoring."

As more is discovered about the Pacific flatheaded borer, growers are encouraged to implement and maintain what are current best practices for preventing or curbing infestation. Removing infested branches is the most important step a grower can take to reducing damage

from infestation. "I've seen trees that have infestation everywhere, so you can't get it all," says Rijal, "but in whatever way you can remove infested branches, especially from mature trees, it can help a lot."

White latex paint applied to the trunks of trees to prevent sunburn can also help prevent the borer, since this pest is attracted to sunburn damage.

Latex painting and removing infested branches are the two best things growers can do while insecticides, chemical application timings, and other methods are being developed or researched in order to combat Pacific flatheaded borer. These practices will remain critically important until better tools become available.

The Pacific flatheaded borer has one generation per year. As a larva, it has an enlarged, flat area behind the head, and is light-colored. As a beetle, the body is a dark bronze with copper spots on the wings.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com



Clonal Rootstocks

from Lab to Field

VX211, RX1, Vlach

Call Us Today.
916-655-1581

Parm Randhawa
parm.randhawa@csplabs.com

3556 Sankey Road, Pleasant Grove, CA 95668

SOUTH VALLEY Nut & Citrus CONFERENCE

November 20th, 2019

7:00 AM to 1:00 PM

Tulare Fairgrounds

215 Martin Luther King Jr Ave, Tulare, CA 93274

- **Free Event**
Growers, Applicators, PCAs, CCAs, and Processors Welcome!
- **CE Credits Offered**
- **Seminars & Workshops**
- **Networking Opportunities**
- **Free Industry Lunch**
- **Free Coffee & Donuts**
- **Cash Prizes**

Pre-Register at WCNGG.COM/SVNCC



Powered by:



MARKETING
AG MARKETING SOLUTIONS

WEST COAST NUT

Progressive

Crop Consultant

Organic
FARMER



@jcsmarketing



JCS Marketing Inc.



@jcs_marketing

PRE-REGISTER ONLINE

AT WWW.WCNGG.COM/EVENTS

To be entered into a drawing to win
a **FREE John Deere Gun Safe**
at the conference!

*Must be present to win



7:00 AM

Registration

CE Credits:

DPR: 3.5 Hours (3 Other, 0.5 L&R)

CCA: 3 Hours

PENDING CE APPROVAL

7:30 AM

Trade Show CE Credits: 15 Minutes, Other

PROFESSIONAL CITRUS TRACK

PROFESSIONAL TREE NUT TRACK

WORKSHOP TREE NUT TRACK

8:00 AM

New Approaches to Phytophthora Management in Citrus

Jim Adasakveg, Professor & Plant Pathologist, UC Riverside
CE Credits: 30 Minutes, Other

IPM Management For Controlling Problem Pests

Kris Tollerup, UCCE Area-wide IPM Advisor
CE Credits: 30 Minutes, Other

Viruses, Phytoplasmas, Union Disorders and Almond Leaf Scorch

Mohammad Yagmour, UCCE Area Orchard Systems Advisor, Kern and Kings Counties

8:30 AM

Psyllid Control for Managing HLB

Greg Douhan, UCCE Area Citrus Advisor for Tulare, Fresno, and Madera Counties
CE Credits: 30 Minutes, Other

Weed Resistance and Identification of Problematic Weeds

Kurt Hembree, Weed Management Advisor, UC Cooperative Extension, Fresno County
CE Credits: 30 Minutes, Other

Winter Juvenile Tree Dieback (WJTD)—a Problem in Pistachio in the San Joaquin Valley

Craig Kallsen, UCCE Farm Advisor

9:00 AM

Navigating Your Citrus IPM Program

John Martzen, PCA since 1979, GAR Tootelian, Inc.
CE Credits: 30 Minutes, Other

NOW Management

Brad Higbee, Field Research & Development Manager, Trécé Inc.
CE Credits: 30 Minutes, Other

SGMA, Voluntary Agreements, and What it Means to Your Farming Operation

Mike Wade, California Farm Water Coalition

9:30 AM

Break

10:00AM

Trade Show CE Credits: 15 Minutes, Other

10:30 AM

How to Mitigate Drift

Tulare Ag Department Marianna Gentert, Deputy Agricultural Commissioner
CE Credits: 30 minutes; Other

Best Pest Management Practices for BMSB and Flatheaded Borer

Jhalendra Rijal, IPM Advisor for San Joaquin, Stanislaus and Merced Counties
CE Credits: 30 Minutes, Other

How to Get the Most Out of Your Irrigation Management Tools

Mae Culumber, UCCE Nut Crops Advisor

11:00 AM

Management and Control Options for California Red Scale

Stephanie Doria, Staff Research Associate Citrus Entomology Lindcove Research and Extension
CE Credits: 30 Minutes, Other

Dealing with Nematode Control in Your Orchards

Kreig Williams, PCA & Agronomist, TriCal, Inc.
CE Credits: 30 Minutes, Other

Crown Gall Management in Walnuts

Elizabeth Fitchner, UCCE Farm Advisor, Kings and Tulare Counties

11:30 AM

BeeWhere Reporting

Tulare Ag Department Marianna Gentert, Deputy Agricultural Commissioner
CE Credits: 30 minutes; L&R

Using Microbial Product in Your Orchard: A Closer Look at the Research

Mark Abildgaard, Western Regional Manager, Agrinos
John Frieden, CEO, Micro-TES, Inc. dba Liventia

12:00 PM

Lunch

NUT COMMODITY UPDATES

Pistachios

Almonds

Walnuts

1:00 PM

Tariffs and the Impact on California Pistachios

Richard Matoian, Executive Director of American Pistachio Growers

The Almond Orchard of Tomorrow: 2025 Goals

Daren Williams, Senior Director, Global Communications, Almond Board of California

Tariffs, Tariff Mitigation and What it Means to You

Jennifer Williams, Marketing Director, Domestic Advertising at California Walnut Board & Commission

1:30 PM

Adjourn

ALMOND VARIETY TRIAL CONTINUES

By KATHY COATNEY | Editor



Systemic Bactericide & Fungicide

- Patented formulation, plants fully absorb copper within 3 hours
- Systemic technology for significantly superior activity
- Protection throughout the plant – outside and inside
- Immediate copper nutrition and reduced soil copper loading
- Low use rates and no visual residue

SymAgro

www.sym-agro.com
541-607-5097 Info@Sym-Agro.com

48-Hour REI 0-Day PHI MRL Exempt



Almond trial CSU farm Chico, California. Photo courtesy of Luke Milliron.

A NEW ROUND OF STATEWIDE almond variety trials were started in 2014. There are three trials, one in Chico, Salida and Chowchilla. Each trial used rootstocks that were common to the area.

In Butte County, the trees are on the Krymsk® 86 rootstock. In Salida, Nemaguard rootstock was used because that area has problems with root knot nematode. In Chowchilla, Hansen peach/almond hybrid was used because it is more tolerant to drought and salinity.

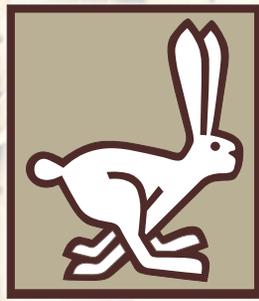
Almond Research Trial

Joe Connell, University of California Cooperative Extension (UCCE) farm advisor emeritus in Butte County, helped establish the almond variety trial at California State University (CSU) farm in Chico, California.

“The main purpose is to observe varieties in semi-commercial conditions that breeders thought, might have promise,” Connell said.

This could also be identifying varieties that have a fatal flaw like problems with shaking, excessive disease problems, or poor yields. Consistently poor producers might be selections yielding in the bottom third of all the varieties in the trial.

Continued on Page 70



JACK RABBIT

CO-JACK

Rodent Control System



Bright white smoke to detect connected openings.

Protect your investment from rodent damage with the safe and effective CO-Jack carbon monoxide delivery system

- Compact and lightweight design
- Available with trailer or on skids
- No permit or license required
- Easy to operate and maintain

Contact Us Today for More Information.

Continued from Page 68

About 30 varieties are being tested and researchers are evaluating the varieties for numerous traits:

- Hull split timing
- Varieties that shake well
- Number of mummies left on the tree
- Disease susceptibility
- Tree growth habit—upright or spreading

Variety trials are a winnowing out process where maybe the top third look promising enough to go further, Connell said.

Observation

Luke Milliron, UCCE orchard systems advisor for Butte County is currently the lead on the almond variety trial at the CSU farm.

The trial has a mix of both self-fertile and non-self fertile.

A big part of the research is observing the varieties during the season, watching

for bloom timing and how they stack up against Nonpareil. Will they potentially be good pollinizers for Nonpareil?

There is one variety that blooms extremely early—before anything else. “It’s shocking, but it had really high yields this year. We don’t understand how that’s at all possible, since the variety is not self-fertile,” Milliron said.

Researchers are also monitoring for diseases like blast at bloom and hull rot later in the season, along with hull split timing for harvest and yield data. They have been collecting yields since 2016.

Shaking and nut removal are being closely monitored. Mummy counts were made after harvest in 2017, and some varieties were identified as having numerous mummies left on the tree. This could create problems with overwintering of navel orangeworm.

As the trial progresses, researchers are learning the optimum shake time.

“If you wait too long to shake them, then they’re too dry on the tree, and they don’t come off very well,” Connell said. “That was part of the problem in 2017. We had some varieties that had

400-500 mummies after shaking and that of course is unacceptable.”

The harvests were more timely in 2018 and 2019 and nut removal was much better, Connell said.

Bloom is being evaluated, too. “Full bloom on most of these varieties is pretty close to Nonpareil because most of the breeders are selecting varieties as Nonpareil pollenizers,” Connell said.

Field meetings are being held so growers can walk the orchard and see what the trees and the structure of the trees look like, Milliron said.

Bruce Lampinen’s lab is also measuring the light interception on the different varieties.

Varieties

Milliron said he sees self-fertile varieties having several advantages for smaller growers.

Smaller operations are contracting out harvest. Having contractors come once to harvest instead of two or three times is a huge advantage, Milliron said.

“It just massively simplifies things,” Milliron said.

But there are challenges to self-fertile, too, Milliron continued. Nonpareil can still demand a significant price advantage over other varieties, he added.

The research trial at CSU, Chico is on Krymsk® 86 rootstock which is by far the most common in the region.

“We do have one variety both on Hansen and Krymsk® 86,” Milliron said.

There are some self-fertile varieties that are now available on Krymsk® 86, Milliron said. “Growers are going to be able to get Independence on Krymsk® 86.”

The Independence and Shasta self-fertile varieties aren’t in the trial. Shasta came out after the trials started, and Independence was proprietary and was unavailable to include in the trial.

“Krymsk® 86 has been a total game changer in our region. It’s not bullet-proof. Every rootstock is imperfect,” Milliron said.

Krymsk® 86 is highly susceptible to root knot nematode, but in general there isn’t a lot of root knot nematode in the Sacramento Valley. But anchorage and tolerance to wet feet are significant benefits of this rootstock.

“That’s why you see almond plantings

WE sort THEM ALL
with *Sherlock*

Walnut	Almond	Cashew	Hazelnut	Pistachio	Pecans	Peanuts
Insects	Shell fragments	Rubber	Wood	Glass fragments	Metal	

www.insort-inc.com **insort**
intelligent selection

going in where there was rice, that kind of thing,” Milliron said, adding self-fertile on Krymsk® 86 could be huge for Sacramento Valley growers.

Milliron is hopeful when they start a new trial that the Shasta self-fertile variety will be part of the project.

About 12 out of 30 varieties in the trial are self-fertile and a couple of them that are partially self-fertile. “Self-fertile varieties are ones that we’re particularly interested in following,” Connell said, to observe their potential.

Rootstock

Connell also has a rootstock trial in south Durham in Butte County that includes the region’s old standard rootstock, Lovell and the new standard, Krymsk® 86. Both rootstocks produce a tree that’s similar in size, vigor and yield.

The trial has six rootstocks in it and it’s currently in the tenth growing season.

“I have a pretty good track record on those rootstocks,” Connell said, so he knows how they’ve been behaving.

The rootstocks were all planted with the Nonpareil variety to see how it does on those rootstocks, Connell said.

Connell is looking at survival, anchorage, vigor, tree size on the rootstocks, blow over, and if the trees are straight or leaning.

“We’re also looking at nutrition of the Nonpareil variety on top of the different rootstocks,” Connell said.

Some of the rootstocks forage for nitrogen, potassium or boron differently than others. Some exclude salts better than others.

To date, there haven’t been any obvious root diseases in that trial. “We have had wet years, and so if there was something that was real susceptible to crown rot or root rot, we might have seen that. So far they’re all healthy, and there haven’t really been any differences in root health or root diseases on the rootstocks in the trial,” Connell said.

One thing that appears to be emerging from with Krymsk® 86 is it may have tolerance to oak root fungus.

In the past, growers would plant Marianna plum rootstock if the orchard had oak root fungus. That was problematic because Nonpareil can’t be grown on Marianna plum.

Krymsk® 86 isn’t immune to oak root fungus, but it’s holding up pretty well, Connell said.

Research Continues

A number of varieties are looking promising, but it’s still too early to make any determinations. Normally variety trials go 10-15 years to allow researchers to observe how the varieties hold up over time.

“The volatility and yield results from year-to-year so far have been

tremendous,” Milliron said.

The research will continue for several more years. “We have yield data from 2016, 2017, 2018 and now 2019, and so it’s going to go for a number of years more,” Milliron said. “At some point we will probably be planting the next generation trial while we’re continuing to monitor these three sites.”

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

Indianmeal Moth Control!

Mating disruptant for stored product moths!!

LESS IS MORE!

MOST COST-EFFECTIVE MOTH CONTROL AVAILABLE!

CIDETRAK® IMM Dispenser
=
LESS MATING
FEWER LARVAE
LESS INSECTICIDE
REDUCED INFESTATION

CIDETRAK® IMM is proven to be the most cost effective tool you can use for prevention and control of IMM and related moths. CIDETRAK IMM has consistently reduced or eliminated season long IMM abundance, and related insecticide applications in very large scale scientific trials. And users report outstanding results from extensive commercial use in food processing, commodity storage and retail facilities.

CIDETRAK® IMM

MATING DISRUPTANT FOR
INDIANMEAL MOTH AND RELATED SPECIES

Reduction of IMM at Retail Store

■ No. of IMM

96% REDUCTION

CT IMM Applied - Fall 2011, Spring 2013, Fall 2013
36 Dispensers per application

INSECT PHEROMONE & HARBORING SYSTEMS
New Edge - And Pests - In Knowledge.

Contact your local supplier and order now!

Visit our website: www.trece.com or call: 1-866-785-1313.

© 2019, Trécé Inc., Adair, OK USA - TRECE, PHEROCOON and CIDETRAK are registered trademarks of Trécé, Inc., Adair, OK USA - TRE-1647, 10/19

Expanded Cal/OSHA Reporting REQUIREMENTS FOR THE NEW YEAR



By AMY WOLFE | MPPA, CFRE, President and CEO AgSafe, Contributing Writer

THIS YEAR'S LEGISLATIVE session ended as most do, amongst a flurry of activity and last-minute wrangling to ensure bills reached the governor's desk. In the pile, since signed by Governor Newsom, were Assembly Bills (AB) 1804 and 1805, which meaningfully modify key definitions associated with worker illness, injury and exposure. As a result of those changes, employers can expect an increase in the number of workplace incidents that now must be reported to Cal/OSHA (Occupational Safety and Health). It's important to understand what's different and how this will impact your operation in the new year.

Key Definition Changes

While modifications to how something is defined may not sound like a big change, in this case, a few words removed and added will have a potentially meaningful impact for employers. AB 1805 modified California Labor Code Section 6302(h) defining "serious injury or illness" by removing the caveat that incidents requiring hospitalization in excess of 24 hours and including now any inpatient hospitalization, other than medical observation or diagnostic testing.

In addition, the definition includes if an employee suffers an amputation, the loss of an eye or serious degree of permanent disfigurement. Amputation

and eye loss are additions to this section. The exemption of injury, illness or death caused by an accident on a public street was expanded to include or on a highway, unless the accident occurred in a construction zone.

The second phrase changed under AB 1805 is "serious exposure," which refers to any exposure of an employee to a hazardous substance when the exposure occurs as a result of an incident, accident, emergency, or exposure over time and is in a degree or amount sufficient to create a realistic possibility that death or serious physical harm in the future could result

Continued on Page 74

PERSONNEL & LAND MANAGEMENT

Always
WORKING
FOR YOU!

Cream of the Crop
AG SERVICE

PROVIDING DEPENDABLE LABOR – SECURING HR & SAFETY COMPLIANCE SINCE '95

WEBSITE COTCAG.COM BAKERS FIELD (661) 588-8675 VISALIA (559) 625-5152



SG

Sierra Gold Nurseries

Walnut Tree Experts

100% Clonal, No Seed!

THE BEST WALNUT ROOTSTOCKS

RX 1 USPP #20649

- ✓ Phytophthora & Crown Gall Resistant
- ✓ Largest Tree & Highest Yield

VX 211 USPP #21179

- ✓ Great Vigor & Nematode Tolerant
- ✓ Survives Well in Field Tests

OPTION 1



ELLEPOT® CONTAINER

- ✓ Paradox Roostock: RX1, VX211, Vlach
- ✓ Great Defense Against Crown Gall
- ✓ Readily Available, Cost Effective

OPTION 2



STRAIGHT BAREROOT

- ✓ Paradox Roostock: RX1, VX211, Vlach
- ✓ One Season Growth
- ✓ Ready to Graft in Your Orchard

OPTION 3



FINISHED TREES

- ✓ Budded or grafted
- ✓ Bareroot Trees on Clonal Paradox Roostock
- ✓ No Field Budding or Grafting Logistics



SG

Sierra Gold Nurseries



GROWING QUALITY FRUIT & NUT TREES SINCE 1951



On-Site Tissue Culture Lab

SIERRA GOLD NURSERIES • (530) 674-1145 • SGTREES.COM

Continued from Page 72

from the actual hazard created by the exposure. Those elements highlighted and bolded are the modified terms, with realistic replacing substantial, thus broadening the scope of the key qualifier in this definition.



Legislation taking effect the first of the year changes how serious injuries, illnesses and serious exposure are defined. Photo courtesy of CAL/OSHA.

These broader definitions are important because all fatalities and serious injuries and illnesses must be reported to Cal/OSHA within eight hours of an employer learning of the incident. Those reporting requirements now include all inpatient hospitalizations, no matter how long the employee stays, unless it was for medical observation or testing. An employer must now report any incident

involving amputation or the loss of an eye.

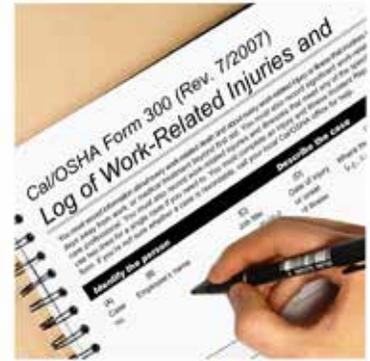
In addition, this expanded definition means employers must report physical harm or death as the result of crimes committed by coworkers or third parties. This change is directly tied to the ongoing discussion around the need for a standard that specifically addresses violence in the workplace. By reporting the serious injuries, illnesses and fatalities as a result of crime, Cal/OSHA will have more detailed data that potentially substantiates the need for such a standard.

New Ways of Reporting Injuries and Illnesses

The other piece of legislation passed was AB 1804, which changes the methods of reporting data to Cal/OSHA. Under current law, employers may report those serious injuries, illnesses and fatalities via phone call and email. Unfortunately, many employers have failed to include all the pertinent details the law mandates be provided. The result has been significant back and forth between employers and

Cal/OSHA to get the needed information for an investigation to be effectively conducted.

This new legislation eliminates the ability to report an incident via email and now allows for submission via an online portal that will be created and maintained by Cal/OSHA. The portal will prompt employers for all the necessary information and ideally, reduce the errors caused with email submissions. Until the portal goes live, emailing incidents is still a viable option. In addition, calling in to report an incident continues to be a compliant method of communication.



Starting the first of the year, employers can report a serious injury, illness or fatality to Cal/OSHA via phone call or using a soon-to-be-created online portal. Photo courtesy of Tolman Wiker.

As harvest winds down for most, now is the opportunity to evaluate your existing worker safety programs and begin planning for how you will make the needed adjustments to be in compliance in the new year.

For more information about worker safety, human resources, labor relations, pesticide safety or food safety issues, please visit www.agsafe.org, call (209) 526-4400 or email safeinfo@agsafe.org. AgSafe is a 501c3 nonprofit providing training, education, outreach and tools in the areas of safety, labor relations, food safety and human resources for the food and farming industries. Since 1991, AgSafe has educated over 85,000 employers, supervisors, and workers about these critical issues.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

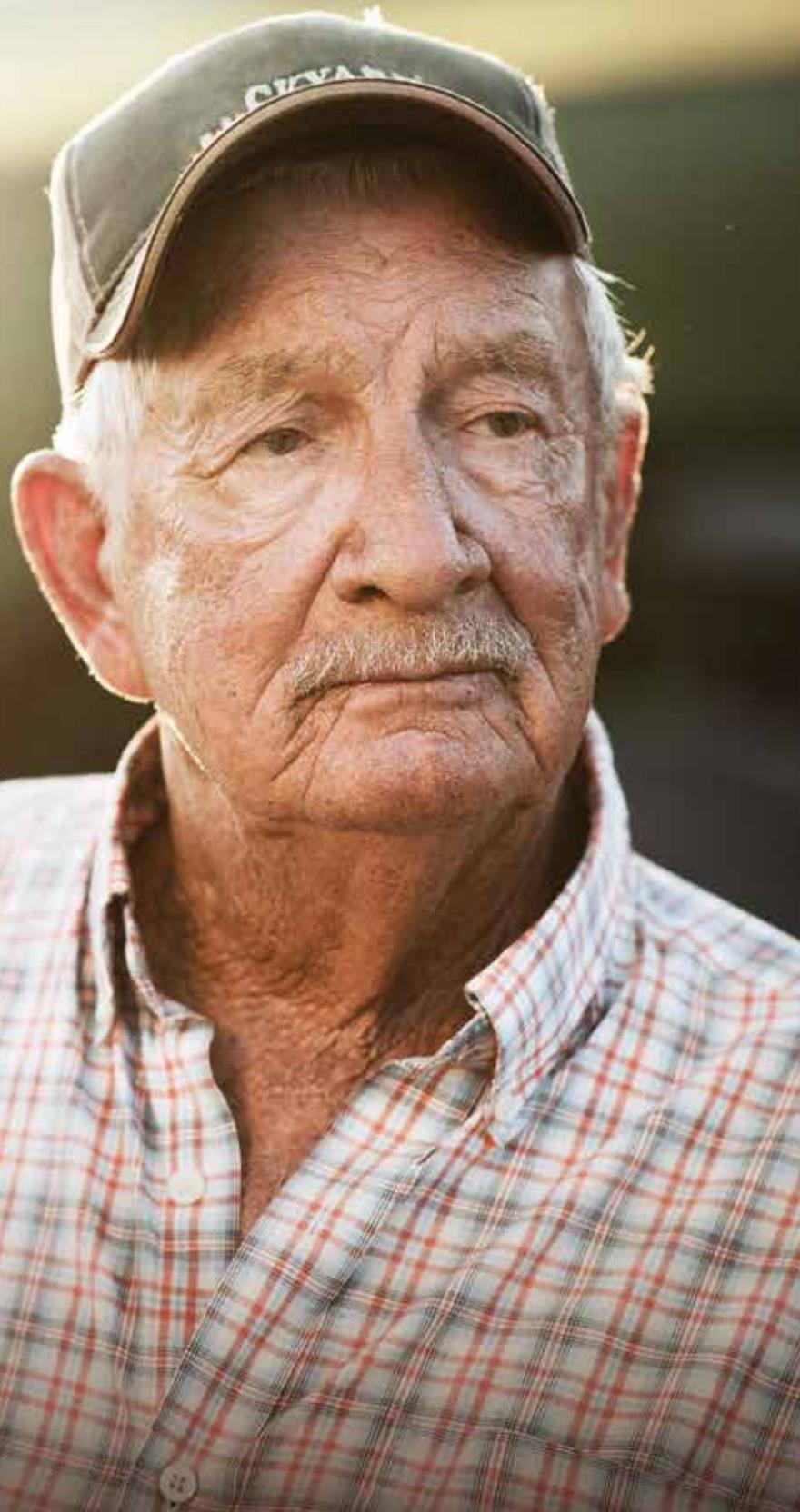
CONTROL YOUR FUTURE

SAFE HARBOR YOUR 2019
30% SOLAR TAX CREDIT NOW.

**Call Today
to Find Out
How You
Qualify!**

POWERING THE VALLEY, LEADER IN AG & COMMERCIAL SOLAR.
JKBENERGY.COM | 209-668-5303

LIKE YOU,
WE'RE IN
THIS FOR
THE LONG
HAUL



AGAMERICA[®]
LENDING

AGAMERICA.COM 208.254.1347

AgAmerica Lending, LLC is a licensed Florida mortgage lender. NMLS ID#372267



CALIFORNIA LEGISLATIVE WRAP-UP FOR 2019

By **ROGER ISOM** | President/CEO, Western Agricultural Processors Association (WAPA), Contributing Writer



2019 UC ALMOND SHORT COURSE

November 5-7, 2019

Visalia Convention Center

303 E Acequia Ave, Visalia, CA 93291

Field Tour November 8 in Parlier



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

For more information go to:

<http://ucanr.edu/sites/almondshortcourse>

WELL THIS LEGISLATIVE YEAR IS IN THE BOOKS... almost. In what could have been a disastrous year from a business perspective, things weren't nearly as bad as they could have been. But that doesn't mean it was good either! California definitely continued on its anti-business trend; but, it just didn't go off the deep end!

As we went into the legislative session for 2019, we were looking at numbers in the Assembly of 61 Democrats, 18 Republicans and 1 vacancy. That's not just a majority, it's a supermajority! Similarly in the Senate, California has 29 Democrats and 11 Republicans. Again, a supermajority, and not a good sign for business. So with that in mind, let's look at how we fared. Keep in mind there were over 2,600 bills introduced this year. Let's look at the most pertinent.

AB 5: (Gonzalez): Worker Status: Employees and Independent Contractors.

This bill would state the intent of the Legislature to codify the decision in the Dynamex case and clarify its application. The bill would provide that a person providing labor or services for remuneration shall be considered an employee rather than an independent contractor unless the hiring entity demonstrates that the person is free from the control and direction of the hiring entity in connection with the performance of the work, the person performs work that is outside the usual course of the hiring entity's business, and the person is customarily engaged in an independently established trade, occupation or business. This bill contains numerous exceptions to the Dynamex test, however no exception was made for owner-operator truck drivers that serve the agricultural

industry, which is where our biggest concern lies. It could mean that any of the truck drivers you contract with would now become your employees. This bill passed the Assembly 61-16, and the Senate 29-11, and was signed by the Governor.

AB 916 (Muratsuchi): Pesticide Use: Glyphosate.

This bill would have, until January 1, 2025, prohibited a city, county, charter city, city and county, or a special district, as defined, from using any pesticide that contains the active ingredient glyphosate. The concern here was the precedent that would have been set. Thankfully, this bill was held in the Senate Agriculture Committee and did not pass this year.

AB 1054 (Holden): Public Utilities: Wildfires and Employee Protection.

AB 1054 requires Pacific Gas and Electric (PG&E), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E) to make \$5 billion in safety investments, otherwise known as "system hardening". This \$5 billion is spent without the normal return on equity that the utilities normally receive, saving ratepayers hundreds of millions of dollars. This legislation also clarifies an issue whereby it allows cost recovery if the costs and expenses are determined just and reasonable based on reasonable conduct by the utility. The legislation requires the utility to bear the burden to demonstrate, based upon a preponderance of the evidence, that its conduct was reasonable. Going forward AB 1054 creates the "Wildfire Fund" which would be used to pay eligible claims related to a covered wildfire. Utility shareholders will contribute \$7.5 billion initially and an additional \$3 billion over 10 years to the wildfire fund. On the other side, ratepayers will be assessed a non-bypassable energy usage charge of \$0.005 per kWh for 15 years. While this charge is new, ratepayers will not see a difference on their bills, because it will simply continue an already existing charge created during the energy crisis several years ago that was scheduled to end in 2020 or so. AB 1054 requires PG&E to resolve all pre-bankruptcy claims and achieve a California Public Utilities Commission

(CPUC) approved reorganization plan that is neutral to ratepayers. Therefore, PG&E shareholders would be responsible for all liability claims from the 2017 and 2018 wildfires, which is currently estimated to be close to \$30 billion! This bill passed the Assembly 63-10, and the Senate 31-7, and was signed by the Governor July 12, 2019.

AB 1080 (Gonzalez) and SB 54 (Allen): Solid Waste: Packaging and Products.

This bill would enact the California Circular Economy and Pollution Reduction Act, which would impose a comprehensive regulatory scheme on producers, retailers, and wholesalers of single-use packaging and priority single-use products to be administered by CalRecycle. As part of that regulatory scheme, the bill would require CalRecycle, before January 1, 2024, to adopt regulations that require producers (1) to source reduce, to the maximum extent feasible, single-use packaging and priority single-use products, and (2) to ensure that all single-use packaging and priority single-use products that are

manufactured on or after January 1, 2030, and that are offered for sale, sold, distributed, or imported in or into California are recyclable or compostable. These bills are very impactful to the agricultural industry, and an area we worked hard on this past session. Both of these bills were held on the floor, but we fully expect these to be taken up in the 2020 session.

SB 1 (Atkins): California Environmental, Public Health, and Workers Defense Act of 2019.

Arguably, this is the most controversial bill and would require specified agencies to monitor federal action and adopt federal regulatory standards through emergency regulations that existed before January 19, 2017 if a change at the federal level resulted in a less stringent standard. It would apply the California Endangered Species Act to the operations of the Central Valley Project, which caused the gravest concern, especially regarding the impact it may have on future water

Continued on Page 78

Back to Your Roots

Using the new Mid-Row Ripper from Schmeiser

Manage your Root Zone using the new Mid-Row Ripper.

- 4X Better Soil Breakout
- Water Savings and Enhanced Drainage
- Superior Mixing of Amendments in the Root Zone

The twin ripper is equipped with patented vibrating winged shanks. Soil structure breakout is unmatched by any conventional ripper.

"It's the new best way for planting orchards and vineyards, period."
- John Duarte of Duarte Nursery



Better Root Zone Management from

T. G. SCHMEISER®

1-800-288-8128 • www.tgschmeiser.com

issues, including the unimpaired flow requirements and the Voluntary Agreements being developed to address them. The bill passed out of the Assembly 48-22, and out of the Senate 26-14. Thankfully, the Governor vetoed this bill on September 27th.

SB 86 (Durazo) and SB 458 (Durazo): Public Health: Pesticide: Chlorpyrifos.

These two bills are the result of the ongoing pressure to eliminate the use of chlorpyrifos. SB 86 would prohibit the use of a pesticide that contains the active ingredient chlorpyrifos. SB 458 would prohibit the use of a pesticide that contains the active ingredient chlorpyrifos, but would make this provision effective unless and until the director adopts control measures for chlorpyrifos and the Director of Environmental Health Hazard Assessment and the chairperson of the State Air Resources Board determine, by clear and convincing evidence, that those control measures will not result in neurodevelopmental or other harm to children after taking into account the potential effects of consuming food or water contaminated with chlorpyrifos that was used in compliance with those control measures, and will not negatively impact sensitive receptors. Both bills were held in committee, primarily because the Administration moved forward with a two year phase-out of Chlorpyrifos.

SB 200 (Monning): Drinking Water.

There has been a lot of discussion over the past few years to address drinking water, including the possibility of the state implementing a fertilizer tax or water fee to pay for the cleanup. This bill establishes the Safe and Affordable Drinking Water Fund in the State Treasury to help water systems provide an adequate and affordable supply of safe drinking water in both the near and long terms. The bill authorizes the state board to provide for the deposit into the fund of certain moneys and would continuously appropriate the moneys in the fund to the state board for grants, loans, contracts, or services to assist eligible recipients. The passage of this bill eliminated the need for the fertilizer tax and water assessment. The bill passed the Assembly 68-0, the Senate 38-1, and was signed by the Governor July 24, 2019.

SB 468 (Jackson): Taxation: Tax Expenditures: California Tax Expenditure Review Board.

This bill would establish in state government a new California Tax Expenditure Review Board as an independent advisory body to comprehensively assess major tax expenditures, as defined, and make recommendations to the Legislature. The bill would require the board to be composed of five members, as specified, who would serve without compensation. This bill passed the Assembly 53-21, and the Senate 28-10 and is headed to the Governor. Our biggest concern here is maintaining the ag sales tax exemption.

Budget Act of 2018

Summary: The final budget totaled \$215 billion, and on June 13, the Assembly and Senate approved the budget sending it to the Governor for his signature. The final agreement included \$100 million for Safe Drinking Water from the Greenhouse Gas Fund and a continuous appropriation of five percent of the Greenhouse Gas Fund with a cap of \$130 million beginning in the 2020-2021 budget cycle. The Legislature and Governor also agreed to an allocation of \$65 million to ag diesel engine replacements and \$34 million for dairy methane reduction projects from the Greenhouse Gas Fund. This is a significant hit to the FARMER funding program, which is a priority for the ag industry; therefore, we are pushing the administration and the legislature to not only restore this funding in 2020, but increase it and lock it in for at least three years.

So while independent contractors are in question, we hope to sidestep a disaster when it comes to the voluntary agreements related to water, should the Governor follow through on his promise to veto SB 1. We avoided a limited ban on glyphosate, paying for all of PG&E's liability from the wildfires, paying a fertilizer tax, and still got significant funding for tractor replacement. All in all, it could have been far worse.

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

RMC
RIPON MANUFACTURING COMPANY INC.

Worldwide Leader in Almond Machinery Technology. RMC is a commercial grade manufacturer of nut processing machinery. Since 1963, RMC has provided turn-key systems to hullers, shellers, and processors of the San Joaquin Valley of California and around the world.

License No. 251698

sales@riponmfaco.com
P. 209.599.2148
F. 209.599.3114
www.riponmfaco.com
Serving the Nut Processing Industry for over 55 years!



Crop Consultant

C O N F E R E N C E

Thank You to our 2019 Sponsors



DINNER SPONSOR & MIXER CO-SPONSOR



TOTE BAG SPONSOR & MIXER CO-SPONSOR



BREAKFAST SPONSOR



BREAK SPONSOR



REGISTRATION SPONSOR



COFFEE SPONSOR & TRAEGER GRILL SPONSOR



AGENDA SPONSOR



MEDIA SPONSOR



INDOOR SPONSOR



INDOOR SPONSOR



INDOOR SPONSOR



INDOOR SPONSOR



CE CREDIT SPONSOR

POWERED BY:



Progressive
Crop Consultant

WEST COAST NUT

Organic FARMER

CO-HOSTED BY:



CERTIFIED CROP ADVISER
WESTERN REGION

All photos are courtesy of the American Pecan Council.

A WORD FROM THE BOARD: THE AMERICAN PECAN COUNCIL

AMERICAN PECANS



By THE AMERICAN PECAN COUNCIL

HAVE YOU BEEN HEARING more about pecans in the last year? It's not a coincidence! Last April, the pecan industry launched **American Pecans, The Original Supernut™**, a national consumer campaign designed to reshape the way Americans think about pecans—beyond the pie.

Mission

The new campaign is the work of the American Pecan Council (APC), an organization of passionate U.S. pecan

growers and handlers (processors) whose mission is to promote the many benefits of the American pecan and tell its story to consumers. Founded in 2016 through a Federal Marketing Order, the APC is funded by industry members who united around the goal of increasing demand for U.S. pecans. “Initially, our research revealed that most consumers had a one-dimensional view of pecans—simply to be enjoyed in desserts,” said Alexander Ott, executive director of the American Pecan Council. “While we love our pie,

we’re using the American Pecans brand to teach consumers about the impressive health benefits of pecans and their versatility for use in every kind of meal and snack.” Pecans are available year-round and with their naturally sweet taste and buttery texture, they’re an ideal ingredient to add to a range of foods beyond deserts—including salads, whole grains and vegetables.

Longevity of Pecan Trees

With the launch of American Pecans,

Linwood Nursery

Providing Pecan Trees Since 1915

“Best time to plant pecans... twenty years ago or today”
- Unknown Pecan Farmer

Order your Linwood Pecan Trees NOW!!!

Our Roots Are Your Foundation For Generations!

Linwood Nursery
PECAN PURISTS SINCE 1915

Call Karlene Hanf: 209.401.0346,
karlenehanf@linwoodnursery.com

209.874.3088 | FAX 209.874.2381 | 23979 LAKE ROAD, LA GRANGE, CA 95329 | WWW.LINWOODNURSERY.COM



the APC has educated consumers about how pecans are super local, super nutritious and super versatile. Of all the major tree nuts eaten in the U.S., pecans are the only ones indigenous to America. The word “pecan” is derived from a Native American word of Algonquian origin that means “a nut too hard to crack by hand.” Pecans have a storied history among Native Americans and early settlers. George Washington and Thomas Jefferson planted pecan trees and can still be found growing at Mount Vernon and Monticello. Pecans are now harvested in 15 states across the pecan belt, from California to North Carolina, and continue to be harvested (by actually shaking the trees!)—many on family farms have been passed down for generations. The United States produces more than 300 million pounds of pecans annually, which is about 80 percent of the world’s pecan supply. Pecans are a labor of love—though pecan trees can produce nuts for upwards of 100 years and beyond, it takes about five to ten years for a new tree to begin producing a full crop. Did you know one of the oldest pecan trees recorded is around 300 years old and still producing?

Nutritious Benefits

While pecan growers have long known the nutritious benefits of pecans, the APC is working to educate consumers on the powerful nutrition profile of The Original Supernut. Did you know that a handful of pecans—about 19 halves—is an excellent source of copper and manganese, a mineral essential for metabolism and bone health? The nut is also a good source of fiber, thiamin, and zinc. They’re also a heart-healthy whole food with multiple health-promoting nutrients and bioactive compounds. Compared to other nuts, pecans are among the lowest in carbs (4 grams) and highest in dietary fiber (3 grams) per serving. In each 1-ounce serving you’ll get 12 grams of “good” monounsaturated fat, with zero cholesterol or sodium.*

Pecans are also extremely versatile and can go far beyond the pralines or pie that first come to mind for many. Enjoy them straight out of the bag as a snack or use them as a tasty topper on morning

oatmeal, yogurt or smoothie bowls. They’re also a great swap for croutons and breadcrumbs—simply toss pecans on a salad to add a nutritious crunch or use pecan meal as a flavorful coating for chicken, fish or pork. You can even use finely chopped pecans in place of ground beef for pecan “meat” tacos or sheet pan eggs with pecan breakfast “sausage.” It’s easy to take any dish from simple standby to super standout—just by adding pecans!

Using Pecans Everyday Meals

As we get into the busy back-to-school season, the versatile Original Supernut is the perfect addition to weekly grocery lists and meal plans—just one bag of pecans makes dishes more wholesome and flavorful, no matter your dietary style. Whether you’re looking to create meals that are gluten free, plant based, or can be made in 30 minutes or less, American Pecans has created meal plans and recipes that bring the nutrients of pecans to your family table along with flavor that even the kids will love.

Pecans in the Spotlight

Pecans are increasingly in the spotlight, and we are excited for what the future holds. According to Mintel’s Global New Product Database, there was a 402 percent growth in pecan flavors for ice cream products, 16.7 percent increase of pecan adult beverages, and 17.6 percent increase of pecans inside dishes from 2017 to 2018. From pecan-crusted chicken to stir-fry and pasta sauces to soups and smoothies, pecans are showing up in many different recipes. Want to discover your new favorite go-to recipe? Visit AmericanPecan.com for a variety of delicious and nutritious recipes and for more culinary inspiration.

**According to the Food and Drug Administration, research suggests (but does not prove) that eating 1 1/2 ounces of most nuts, such as pecans, each day as part of a diet low in saturated fat and cholesterol may help reduce your risk of heart disease. One serving of pecans (28 grams) contains 18 grams unsaturated fat and only 2 grams saturated fat.*

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

WE PROMOTE
AMERICAN
PECANS

American
PECANS
THE ORIGINAL SUPERNUT

SO YOU CAN
FOCUS ON
SELLING

.....

LEARN HOW YOUR
FMO IS WORKING
HARD FOR YOU:

AMERICANPECAN.COM

FSMA PRODUCE SAFETY INSPECTIONS: WHAT TO EXPECT

By CALIFORNIA WALNUT BOARD

THE FOOD SAFETY MODERNIZATION ACT (FSMA) was passed in 2011 to help prevent food-borne illness outbreaks. Under the FSMA rules are the Preventive Controls Rule (PCR) which covers processors/handlers and the Produce Safety Rule (PSR) which covers farms. The PSR is being implemented in stages between 2019 and 2021 depending on farm size.

In California, Food and Drug Administration (FDA) is contracting with the California Department of Food and Agriculture (CDFA) to conduct the on-farm inspections to verify FSMA compliance. CDFA has created the Produce

GROWERS CAN ALSO PARTICIPATE IN AN ON-FARM READINESS REVIEW INSPECTIONS, A 'MOCK INSPECTION' IF YOU WILL, TO HELP THEM UNDERSTAND PSR REQUIREMENTS AND GET READY FOR THE OFFICIAL INSPECTION.

Safety Program (PSP) to educate and assist growers in complying with PSR requirements.

Impact on Walnut Growers

All farms covered under the Produce Safety Rule must take several steps to comply with its requirements. Key steps include at least one farm representative complete an FDA-recognized Produce Safety Rule Grower Training Course. This training, in turn, will inform how to implement required Produce Safety Rule food safety practices on your farm and any documentation that is needed.

The Grower Training need only be taken once. The California Walnut Board (CWB) sponsored complementary grower trainings for the last three years. And while CWB has concluded the complementary trainings, CDFA is currently offering low cost, subsidized training courses throughout the state, a list of which can be found here,

<http://www.cdfa.ca.gov/producesafety/training.html>

Growers can also participate in an on-farm readiness review inspections, a 'mock inspection' if you will, to help them understand PSR requirements and get ready for the official inspection. CDFA has clarified that any farm inspection will always be announced. If growers wish to receive updates about Produce Safety program, they can sign up here: <http://www.cdfa.ca.gov/producesafety/maillinglist.html>

For additional PSR related questions, growers can also email: producesafety@cdfa.ca.gov.

(Source: California Department of Food and Agriculture Produce Safety Program: <http://www.cdfa.ca.gov/producesafety/>)

Comments about this article? We want to hear from you. Feel free to email us at article@jcsmarketinginc.com

Do you
have the
best nut
processing
software?

get your  in order.

- Manage variety, size, grade, moisture, and all other quality attributes in one inventory solution
- Top of the line software, updated monthly; we invest \$1M annually to ensure it stays the best
- Implementation in 4 to 6 months

Tyler Marshall
425.408.9522
TMarshall@ParityCorp.com





POWERFUL MARKETING DRIVES POWERFUL SALES

It's true. When our TV campaign is on the air, visits to the California Walnuts website jump an incredible 500% or more!

And our newly launched consumer campaign tested very highly with consumers, with 78% saying they would be **more likely to purchase** after seeing the ad. Research showed that our consumers are seeking simple solutions to make life easier and more manageable. The new spots feature humorous vignettes illustrating that modern life isn't always easy. This effort will be supported by an unprecedented investment at retail, to remind consumers to add California walnuts to their shopping cart.



An Industry Working Together.

At the California Walnut Board, we're continually working for you to drive the awareness and sales volume of walnuts. To stay informed, sign up for our newsletter at walnuts.org, and stop by to say hi at the upcoming agricultural shows and California Walnut Conference.



walnuts.org/our-industry

Make your next move
your best move.



Protecting against almond bloom diseases.

To beat an opponent that is constantly evolving, you need a strategic game plan – one that capitalizes on your enemy’s weaknesses and fortifies your orchard against whatever move bloom diseases make. Get proactive with Scala® at pink bud and follow with Luna® at bloom through post-bloom to counter when diseases are strongest. Together, you have a game plan for effective resistance management and bloom disease protection for a winning season.



/// Learn more at
LunaScalaGamePlan.com.

