

# WEST COAST NUT

November 2018 Issue

## SPOTLIGHT:

California Agriculture  
Fastest Growing Sector  
for Solar  
See page 4

## In This Issue:

Fall and Winter Irrigation Management for Nut Crops

Botryosphaeria Control—What You Need to Know

The Importance of Continuing Education for Farmers

The Latest Scoop on Red and Black Walnuts



**SAVE THE DATE**  
**NOV. 28, 2018**  
See page 67 for details

**KERN COUNTY**  
*Ag Day*

**JCS** MARKETING  
PUBLICATION

Photo courtesy of Rachael Bertagna.



## Higher Almond Yields with Luna<sup>®</sup>

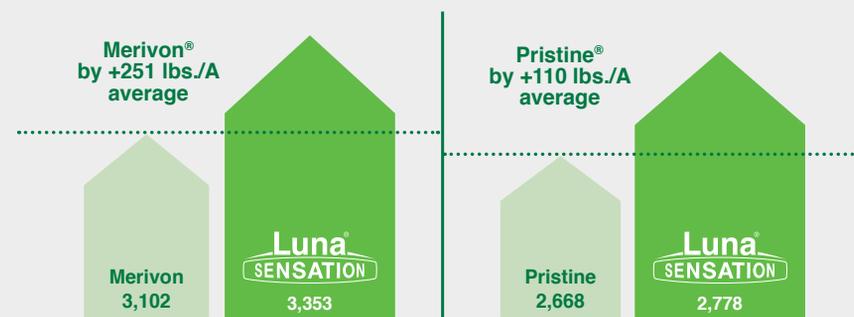
Luna Sensation<sup>®</sup> | Luna Experience<sup>®</sup>

From bloom to harvest Luna<sup>®</sup> fungicide protects almonds from **8 major diseases** to **improve plant health** and ensure higher almond yields season after season.



**SPRAY AT BLOOM** FOR BEST RESULTS AT HARVEST.

### LUNA<sup>®</sup> OUT-YIELDS IN PERFORMANCE TRIALS



SPRING AND EARLY SUMMER (AROUND BLOOM TIME) IS WHEN MOST DISEASES OCCUR.

- Scab**  
*Cladosporium carpophilum*
- Jacket Rot**  
*Botrytis cinerea*
- Shothole**  
*Wilsonomyces carpophilus*
- Hull Rot**  
*Rhizopus* spp.  
*Monilinia* spp.
- Anthracnose**  
*Colletotrichum acutatum*
- Brown Rot Blossom Blight**  
*Monilinia laxa*
- Alternaria Leaf Spot**  
*Alternaria alternata*
- Almond Leaf Rust**  
*Tranzschelia discolor*

**8 DISEASES THAT IMPACT ALMOND TREE HEALTH & YIELD**

LEARN MORE ABOUT HOW LUNA CAN HELP YIELD ABUNDANT HARVESTS AT [LUNAFUNGICIDES.COM](http://LUNAFUNGICIDES.COM).



Luna<sup>®</sup>

### How It Works

Luna<sup>®</sup> is a breakthrough systemic fungicide with uniform uptake after application, allowing it to effectively enter the buds, blooms and new tissue where disease hides. Make Luna a cornerstone of your fungicide program to control eight almond diseases for long-term tree health.



## Protection Means Profits

Luna<sup>®</sup> out-yields Merivon<sup>®</sup> by more than 251 lbs./A.

**+251 lbs. = an additional \$800/A\***

Luna out-yields Pristine<sup>®</sup> by more than 110 lbs./A.

**+110 lbs. = an additional \$351/A\***

\*Source: Average yield gain in dollars per pound based on California Agricultural Statistics Review, 2014-2015, California Department of Food and Agriculture, page 81.



**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**

<b>Alex Ott</b> Executive Director, American Pecan Council	<b>Jenny Holtermann</b> Contributing Writer
<b>Almond Board of California</b> Contributing Writer	<b>Julie R. Johnson</b> Contributing Writer
<b>Amy Wolfe</b> MPPA, CFRE, President and CEO, AgSafe	<b>Mae Culumber</b> UCCE Farm Advisor
<b>Jeff Bowman</b> CPA	<b>Rich Kreps</b> CCA, Contributing Writer
	<b>Safe Food Alliance</b> Contributing Writer

**UC Cooperative Extension Advisory Board**

**David Doll**  
UCCE Farm Advisor, Merced County  
**Elizabeth Fichtner**  
UCCE Farm Advisor, Tulare County  
**Dani Lightle**  
UCCE Orchards Advisor, Glenn/Butte/Tehama Counties  
**Franz Niederholzer**  
UCCE Farm Advisor, Colusa/Sutter/Yuba Counties

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.

# WEST COAST NUT

By the Industry, For the Industry

## IN THIS ISSUE

- 4 California Agriculture Fastest Growing Sector for Solar
- 10 Fall and Winter Irrigation Management for Nut Crops
- 16 Botryosphaeria Control—What You Need to Know
- 22 The Importance of Continuing Education for Farmers
- 26 New Research on Walnut Varieties Shows Promise
- 32 Farm Tax 2018: A Changing Landscape
- 38 Latest Research on Salinity Management in Pistachios
- 44 American Pecan Council Asks Consumers to #PledgePecans
- 50 Choosing the Right Hazelnut Variety for your Operation
- 54 Forklift Safety 101
- 58 The Produce Safety Rule: What it Means for Nut Growers
- 64 Know Your Roots
- 70 The Latest Scoop on Red and Black Walnuts
- 76 Winter Sanitation: The Foundation of Navel Orangeworm Control

View our ePublication on the web at [www.wcngg.com](http://www.wcngg.com)

**FEATURED ARTICLE**

It is no wonder that California agriculture’s fastest growing sector is adopting solar at a fast pace. “These permanent crops are a long term investment and we know we are going to need energy for a long time. Long term, solar made sense,” said Red Bluff walnut and prune grower Mike Vasey.

*See the full story on page 4*



# CALIFORNIA AGRICULTURE

## *Fastest Growing Sector for Solar*

By: Cecilia Parsons | Associate Editor

**I**t is no wonder that California agriculture's fastest growing sector is adopting solar at a fast pace.

### **Solar Makes Dollars and Sense**

"These permanent crops are a long term investment and we know we are going to need energy for a long time. Long term, solar made sense," said Red Bluff walnut and prune grower Mike Vasey.

Vasey installed his first solar system seven years ago to run a prune dehydrator and power well pumps. Today he has three more solar systems generating around a third of a megawatt, powering, in addition to dehydrator and wells, homes and an office. The systems are both ground and roof mounted.

His first solar panels were made in

China, he said, but his most recent installation has U.S.-made panels. Prices have come down since their first installation, he added and pay-off for the systems is faster, though state rebate programs have ended. Loss of the rebate has been off set by the lower cost of panels, he said.

Vasey estimated that the solar system supplies 85-90 percent of his electrical power. With incentives, reduced costs for energy and depreciation, installing the systems made sense from a business perspective, he said.

### **Solar Installation Led by Tree Nut Markets**

Nut growers and processors make up a large portion of the agricultural solar installations confirmed Chad

## **O'CONNELL SOLAR CONSULTING**

CSLB Lic# 1015327

### **PACIFIC LAND & ENERGY** REAL ESTATE CADRE LIC # 1440543

We handle all aspects of the project including savings analysis, financing, rebates, permitting, grants, installation and commissioning. Even after your installation is complete we are able to help with any issues or questions. Customer satisfaction is our number one priority. We can also help with any of your real estate needs.

We develop comprehensive and detailed information on your facility for the competing solar companies. Your business can compare the solar provider's offerings in a side-by-side report individualized for your facility.

#### **DANIEL O'CONNELL**

cell **530.632.3902**

office **916.400.4255**

daniel@pacificlandandenergy.com

2.5 MW solar panels. All photos courtesy of Chad Cummings, JKB Energy.

Cummings of JKB Energy. Cummings, who has been in the solar industry since 2010, said consistently, solar installation pace has been led by tree nut markets.

## Large Solar Systems

The largest solar power system in the San Joaquin Valley is an eight acre project located near I-5 at Kettleman City. Installed by JKB Energy, it is a fixed ground-mounted 2.5 megawatt solar power system that can produce more than four million kilowatt hours annually. This provides 88 percent of onsite energy needs for a large scale irrigation system servicing multiple almond and pistachio ranches in the surrounding area.

Another large project servicing the nut industry is at the Setton Pistachio processor in Terra Bella. That 1.7 megawatt solar power system is designed to produce 2.6 million kilowatt hours, powering the 300,000 square foot processing facility.

## Buyers Market

There are plenty of solar adopters in the dairy, tree fruit and row crop sectors, Cummings noted, but generally, the more profitable a crop is in a given year, the more that industry purchases solar to offset tax liability for that year. The systems also create a hedge against continually rising energy costs.

Those initiating a solar energy project can expect an on-site visit to evaluate the location. With a 12-month energy records, the solar developer can provide an assessment of potential savings with solar system.

It is a buyer's market right now in solar, Cummings said, with competitive pricing for systems. Efficiency and reliability of products are also improved. Solar costs vary from project to project, making an average cost difficult to identify. However, Cummings said the typical payback for solar facilities is three-four years. It is not unusual to exceed a 20 percent rate of return on a mid-size solar project, he said.

## Tariffs

Given the benefits of solar, including a faster pay-off time, Cummings and others in the solar industry do not believe the tariff on Chinese-made components announced last year would have significant impacts on adoption rates.

Cummings said the Section 201 Solar Tariff announced in mid 2017 caused market prices of solar modules to increase until the tariff was negotiated

and implemented. He also noted that the module market seemed to react more to fear than the actual tariffs. Currently, Cummings said module prices have returned to a normal level with manufacturers apparently absorbing much of the tariff monetary impact. The most recent tariff issue impacting the solar industry is related to the steel and aluminum used in solar manufacturing solar systems.

*Continued on Page 6*



**sunworks**  
Solar Power

**LOWER YOUR OPERATING COSTS FOR YOUR ORCHARD AND PROCESSING PLANT**

**25 YEARS**  
WARRANTY

Agricultural solar projects generate long term savings, tax benefits, and near-zero electricity rates, a great way to take some of the burden of operational overhead off your shoulders. Working with Sunworks, you will receive a single provider support with quality business practices that exceed industry standards and uphold our ideals of ethics and safety.

**866.600.6800 | SUNWORKSUSA.COM**

CA Lic# 441690



2.5 MW / 8 acre solar site in Kettleman for almond & pistachio orchards.

*Continued from page 5*

There may be some issues related to steel and aluminum costs due to the tariffs, Cummings said, but he doesn't see major issues related to sourcing components.

Solar consultant Daniel O'Connell of O'Connell Solar Consulting said fear of the announced tariff's impact did lead to some buying and hoarding of solar components, but the hit has not adversely affected system pricing.

"The uncertainty was worse than the reality," O'Connell said of the tariff.

### Solar Installation

As solar system prices have leveled off, buyers are realizing that energy purchased from a utility company will continue to rise, he added.

O'Connell said initially solar installation cost \$7.50 per watt and, though costs vary depending on the complexity of installation, the average now is around \$1.65 per watt.

"Solar in the ag sector is growing. The almond industry and water districts are among the big adopters," O'Connell said.

Financing for mid-size solar projects and working with utility companies continue to be challenges for solar installations. Obtaining financing for home solar installation is easy, O'Connell said. It is the mid-size projects for water districts and small processors in the 100-500 kWh range that lending institutions are rejecting. Given their tax liability, financing those projects could be a big opportunity for banks, O'Connell said.

Delays with solar system hookups to power lines and the utility company's need to upgrade their system prior to connecting a new solar installation are ongoing issues. Although states have mandated higher levels of renewable energy, Business Insider reports that several large U.S. utility companies are lobbying to reverse economic incentives for solar installations.

There is also push back on net metering, where excess power from a solar system is sold back to the grid. Business Insider reports that Edison Electric Institute, an industry organization comprised of the country's largest investor-owned electric companies is pushing to buy back solar at lower rates.

### Federal Investment Tax Credit

The more urgent topic in the solar industry, Cummings said, is the 'sunsetting' of the Federal Investment Tax Credit (ITC)—the 30 percent solar tax credit. *Continued on Page 8*

**NO FINE PRINT**

We think a handshake still means something.

**JKB ENERGY**  
LEADER IN AG & COMMERCIAL SOLAR

Start saving today.  
JKBENERGY.COM | 209-668-5303



# HELMSTAR PLUS SC

fungicide



## THERE CAN ONLY BE ONE CHAMPION

Introducing HELMSTAR PLUS SC. A new champion for best in class disease control.

With a superior formulation of the industry's most powerful systemic active ingredients, HELMSTAR PLUS SC provides maximum protection to elevate almond production to its highest potential. As a single, simple solution across multiple crops, HELMSTAR PLUS SC delivers the protection you expect with the economic value you demand.



[helmstarplus.com](http://helmstarplus.com)

Always read and follow label directions. HELM® is a trademark of HELM AG. ©2018 HELM Agro US, Inc. All rights reserved.

Continued from page 6

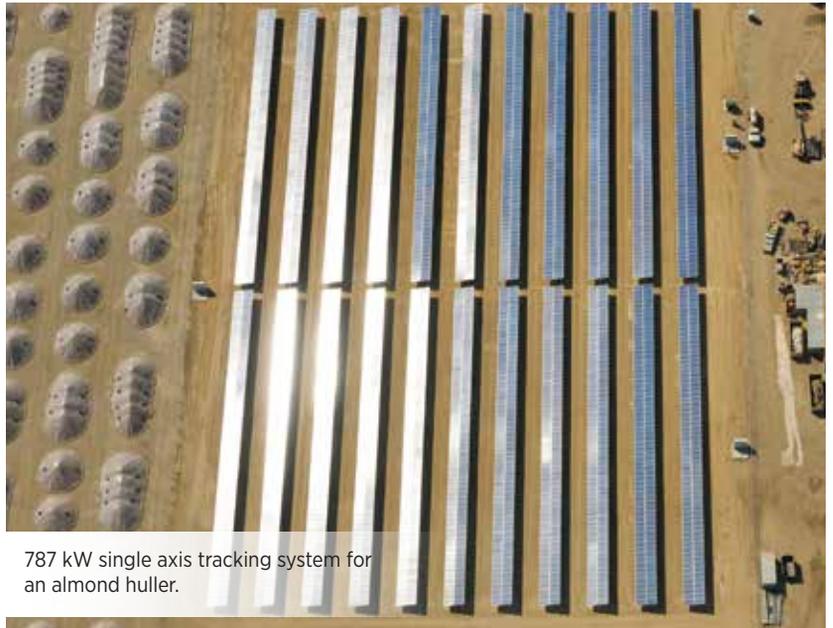
“This is the most significant incentive change the solar market will experience in the near future,” Cummings said.

Those contemplating a solar system installation should safe-harbor their Federal Investment Tax Credit, locking in the 30 percent tax credit rate for projects several years out.

Beginning in 2020, the ITC will start on a decreasing schedule that will ultimately settle at 10 per cent, indefinitely, in 2022.

If construction of a solar system begins at any time before 2020, the ITC will equal 30 percent of eligible costs. If construction begins in 2020, the ITC equals 26 percent of eligible costs. If construction begins in 2021, the ITC equals 22 percent of eligible costs. If construction begins on an eligible solar facility in 2022 or later, the ITC drops to 10 percent of eligible costs. Solar facilities also have a statutory placed-in-service deadline.

According to solar industry reporting, the Internal Revenue Service guidance reads that a taxpayer may begin construction by either starting



787 kW single axis tracking system for an almond huller.

physical work of a significant nature or paying or incurring five percent or more of the total cost of a facility. The taxpayer must also continue construction until the facility is complete, barring delays that are beyond control. The IRS guidance provides for a safe harbor under which the continuous construction requirement is deemed satisfied if the taxpayer places a facility in service during the calendar year that is no more than four calendar years after the calendar year when construction began.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

**Pre-Season Specials  
are Starting in October!  
Plan ahead! Call us for details.**



79 Series  
Air-Cab Sweeper



3000 Series  
Mower



34 Series  
Air-Cab



860 PTO  
Harvester



57 Series  
Sweeper



3648  
Elevator



ST-14  
Shuttle Truck



8770  
Harvester

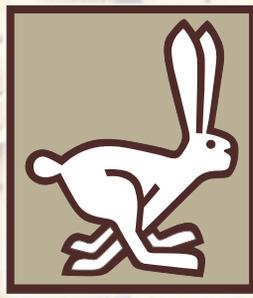
Watch videos of Flory products in action... [goflory.com](http://goflory.com)

# BEELER TRACTOR CO.

<b>YUBA CITY</b> 887 Onstott Rd • CA (530) 673-3555	<b>COLUSA</b> 1954 Hwy. 20 • CA (530) 458-5196	<b>ANDERSON</b> 2025 Barney Rd • CA (530) 378-1116
---	--	--

**CNH INDUSTRIAL** GENUINE PARTS

[www.BeelerTractor.com](http://www.BeelerTractor.com)



# JACK RABBIT

## STICK JACK PREHARVESTER DE-STICKER/CONDITIONER



**Remove sticks, reduce labor and increase harvester performance in a single pass.**

- Eliminate sticks in a single pass.
- Unload sticks with a flip of a switch.
- Increased harvesting productivity.
- Adjustable ground clearance.
- Adjustable crowders for even windrows.
- Optional walnut fan & PTO pump available.

**Contact Us Today for More Information.**

471 Industrial Ave. • Ripon, CA 95366 • 209.599.6118 • [www.jackrabbit.bz](http://www.jackrabbit.bz)



# FALL AND WINTER IRRIGATION MANAGEMENT *for Nut Crops*

By: Mae Culumber | Farm Advisor UCCE Fresno

After all the nut harvests are through for the year, some managers may ask “How much water do trees need when leaves are still on the tree? How much do they need through the winter?” Central Valley’s Mediterranean climate allows deciduous tree crops to hold on to their leaves until months after harvest, usually until the first hard freeze. With optimal conditions, transpiring trees will continue to photosynthesize, the process by which plants capture energy from the sun and carbon dioxide (CO<sub>2</sub>) from the air to produce sugars and carbohydrates that supply the building blocks for tree growth and next year’s crop. Maintaining a healthy canopy postharvest is critical to building carbohydrate reserves and fruitful bud development, and many orchard managers have reported rapid defoliation following preharvest regulated deficit irrigation (RDI) and mechanical shaking. RDI during hull-split in almonds and before harvest in all nut crops, depletes available moisture reserves and can cause stress to develop more rapidly during the postharvest period.

A postharvest irrigation is typically applied immediately after harvest to relieve trees of stress. However, soon after, irrigation is often greatly reduced or ended for the season to reduce vigor and provide frost damage protection for the winter. As the weather cools tree water requirements will decrease, but fall is an important time to continue site specific, calculated irrigation decisions that factor in tree water stress (see UCANR pub 8503, Fulton and Buchner, 2014), the moisture in the soil profile, and either historical or real time evapotranspiration (ET<sub>c</sub>) rates (<http://cekern.ucanr.edu/files/98834.pdf>).

## Water Needs Vary Between Crops

Almond, pistachio, and walnut may have different water needs postharvest due to phenological differences in fruitful bud formation, the process that determines if a bud will flower or produce vegetative growth in the following season. It is well established that resuming irrigation in the postharvest is critical for almond, as severe stress during this developmental stage has been associated with yield reduction in the following season (Esparza et al. 2001). In almond, bud differentiation occurs in the time before and after harvest (depending on variety) and can extend several weeks afterward (Doll and Shackel, 2015). Looking at the 30-year average for ET<sub>c</sub> rates (Table 1), an almond block in the Five Points region would require 119 inches of water from September to December after a harvest in late August. Over half of the water loss occurs in September, the critical period for harvest stress recovery and fruitful bud differentiation.

Less is known about the late season irrigation needs for pistachio and walnut, as the main period of next seasons flower development is completed by June and July in mature trees. Pistachio briefly resumes fruitful bud formation in the fall, but little research has investigated the effect of water deficit on this development (Catlin, 1998; Ferguson et al., 2015). Research by Spann et al. 2008 found pistachios acquire the necessary reserves for kernel fill from carbohydrates accumulated in the current season. It is not clear what previous season carbohydrate storage has on next year’s crop, and what affect a late season water deficit has on these processes. In pistachio and walnut, Goldhamer and Beede (2004) found a 70 to 75 percent reduction in irrigation (Oct. 1-Nov. 15 in the San Joaquin Valley) did not adversely affect Kerman pistachio yields in the following season. For many growers who adhere to an October 1st cutoff for irrigation, this would amount to a full deficit of 4.88 inches of water from October through November. Kerman, is usually harvested in

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 —

- AGRICULTURAL
- COMMERCIAL
- MUNICIPAL
- DOMESTIC

— LOCAL SALES & SERVICE —

- NEW & USED PUMPS
- MOTORS & CONTROL
- WELL DEVELOPMENT
- REHAB & REPAIR

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

Month	30-year avg ETo (5-Points)	almonds K <sub>c</sub> (Zone 15)	almond ET <sub>c</sub>	pistachio K <sub>c</sub> (Zone 15)	Pistachio ET <sub>c</sub>	walnut K <sub>c</sub> (SJV)	walnut ET <sub>c</sub>
January	1.34	0.40	0.54	-	-	-	-
February	2.17	0.45	0.98	-	-	-	-
March	4.18	0.69	2.88	0.11	0.46	0.12	0.50
April	6.12	0.81	4.99	0.45	2.76	0.61	3.71
May	8.07	0.93	7.46	0.93	7.46	0.84	6.78
June	8.79	1.03	9.05	1.17	10.28	0.97	8.48
July	8.90	1.08	9.57	1.19	10.59	1.14	10.14
August	8.21	1.06	8.72	1.17	9.63	1.14	9.36
September	6.40	0.99	6.33	1.01	6.46	1.03	6.56
October	4.41	0.83	3.64	0.82	3.63	0.70	3.07
November	2.22	0.62	1.39	0.56	1.25	0.28	0.62
December	1.28	0.40	0.51	-	-	-	-

**Table 1.** Monthly reference evapotranspiration (ET<sub>o</sub>) for five points based on a 30-year average from 1997 to 2007, with corresponding zone 15 crop coefficients and ET<sub>c</sub> rates for almond, pistachio, and walnut.

the second or third week of September, close to the October 1st cutoff” and the impacts of withholding water at this stage may be minimal. Other earlier varieties like Golden Hills and Lost Hills are sometimes harvested as early as a month before Kerman and may be very susceptible to water stress if irrigation is either cutoff or applied at a severe deficit. The average ET<sub>c</sub> needs for

Five Points pistachios is over 16 inches in August through September (Table 1), indicating early varieties may be particularly vulnerable to early irrigation deficit after harvest.

### Controlled Deficits

In walnut, controlled deficits are thought to help harden-off new shoots

and decrease the susceptibility of these young shoots to damage by early frost. Conversely, extreme deficit may cause winter die-back on new growth as well as older wood in walnut trees. With a seemingly narrow margin between the risk of frost damage and winter kill, it seems fall is a critical time for attention to tree water stress as an indicator of

*Continued on Page 12*



### 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**



**Figure 1.** Dendrometer mean daily shrinkage and overall growth (brown line) from the end of September to end of October 2014 for Howard Walnut trees in a trial at UC Davis. The blue arrow indicates the point where tree growth levels off for the season.

*Continued from page 11*

the appropriate application of water. Tree water status measurements can be combined with soil moisture and ETC monitoring to make calculated decisions about when and how much water to apply. Dendrometers continuously monitor daily cycles of shrink and swell of the tree trunk in response to dehydration and hydration. Less water in soil and/or increased ETC rates will cause the trunk to shrink more each day. The sensors also provide a trend of trunk growth through the season. Dendrometer tree water stress and tree growth monitoring in a UC Davis trial (brown trend line, Figure 1) resulted

in an overall leveling-off of seasonal tree growth in mid-October. This may demonstrate a physiological shift from growth to storage of carbohydrates for the following year and may also indicate when it may be appropriate to pull back on irrigation for the season.

Preharvest RDI irrigation practices may not be the only cause of yellowing leaves and defoliation late in the season. Irrigation trials in walnuts (Lampinen, personal communication), found trees that received an early season irrigation with higher application rates throughout the season began to defoliate up to two full weeks prior to normally irrigated trees (Figure 2).

## Over and Under Irrigation

Over and under irrigation can both be catalysts for stress in tree crops. With an increased tendency for stress this time of year, it is important to monitor tree water stress and soil moisture content to ensure that trees maintain a healthy green canopy after harvest through the end of the season.

After leaf drop, ETC rates for nut crops are very low. Since tree water use is minimal during the winter months, water use needs may be met by the last irrigation around the end of October or beginning of November, combined with rainfall. In almond, the 30-year average (Five-points) for ETC in almond (Table 1) is estimated to 1.4 inches in November and 0.5 inches December. Without rain, irrigation may be recommended in some regions to ensure adequate moisture will be available at bloom. The effects of winter drought on almond bloom development in the following year is currently being researched and preliminary data suggests bloom timing may be delayed in drought winters. Most of the precipitation in the Central Valley comes in January and February and in many years may provide enough water without supplemental irrigation. For those who choose to irrigate in winter, the amount of water needed to fill the profile depends on the soil type, usually 3 to 6 inches of water should be adequate. Irrigators should make sure



**Figure 2.** Picture of late season (November, 2016) health and vigor of young walnut trees in a variable irrigation trial. Trees on the left received normal irrigation to match ETC throughout the season, and trees on the right received excess water. Trees on the right defoliated a full two weeks before those on the left. Photo courtesy of Bruce Lampinen.

*Continued on Page 14*



# Alion®



## Residual control that goes the distance.

**Alion® pre-emergence herbicide:**

- Delivers powerful control of grass and broadleaf weeds, including resistant species, to protect your high-value crops
- Offers up to 6 months of residual control, reducing the number of in-season sprays
- Allows you to focus less on weeds and more on profitability



**Labeled for use on citrus, pome fruits, stone fruits, grapes, tree nuts and olives.**

**Cleaner. Longer. Alion.**

Not all uses are registered in all states. Check local recommendations.

© 2018 Bayer CropScience LP, 800 North Lindbergh Boulevard, St. Louis, MO 63167. Always read and follow label instructions. Bayer, the Bayer Cross, and Alion are registered trademarks of Bayer. Alion is not registered for use in all states. For additional product information, call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at [www.CropScience.Bayer.us](http://www.CropScience.Bayer.us).



*Continued from page 12*

to keep irrigation sets to less than 24 hours to avoid the risk of soil saturation and Phytophthora. A good strategy is to begin applying irrigations in January (one inch per event) leaving some ability of the soil to absorb any rainfall that occurs before flowering and leafing. If no additional rainfall occurs, continue applying one inch every few weeks with the goal of reaching a full profile by the time of flowering.

### References:

Doll, D., and K. Shackel. (2015). Drought management for California almonds. ANR Publication 8515 10

Esparza, G., Dejong T., Weinbaum S., and I. Klein. (2001). Effects of irrigation deprivation during the harvest period on yield determinants in mature almond trees. *Tree physiology*. 21. 1073-9.

Ferguson, L., Polito, V., and C. Kallsen. (2015). The Pistachio Tree; Botany and Physiology." *Fruits and Nuts*. UC Davis. 31-39.

Fulton, A., Grant, J., and R. Buchner (2014). Using the Pressure Chamber for Irrigation Management in Walnut, Almond and Prune. UC ANR 8000 Series Publications 27

Goldhamer, D.A and B. H. Beede. (2004). Regulated deficit irrigation effects on yield, nut quality and water-use efficiency of mature pistachio trees. *Journal of Horticultural Science & Biotechnology*. 79 (4) 538-545.

Polito, V., (1998). *Floral Biology: Flower Structure, Development, and Pollination* In: Ramos, D.E. (Ed.) *Walnut Production Manual*. University of California Division of Agriculture and Natural Resources. Publication 3373. pp. 127-132.

Spann, T., Beede, R., and T. DeJong. (2008). Seasonal carbohydrate storage and mobilization in bearing and non-bearing pistachio (*Pistacia vera*) trees, *Tree Physiology*, 28, (2), 207-213, <https://doi.org/10.1093/treephys/28.2.207>

# SUPPRESS®

## HERBICIDE EC

### Effective Organic Weed Control

SUPPRESS® Herbicide EC is a broad spectrum contact herbicide for post-emergent, non-selective weed control.

**SUPPRESS® Herbicide EC provides fast and effective burndown**



4 hours post-application



72 hours post-application

- Proven efficacy
- No pre-harvest interval
- Excellent tool in IPM
- Helps break chemical resistance
- Non-volatile, emulsifiable concentrate



(800) 876-2767  
www.westbridge.com

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*



# Sierra Gold Nurseries

Yuba City, California

Your Nursery Innovation Leader For

• *Almonds* • *Walnuts* • *Pistachios*



Best New Hybrid Rootstocks  
For All Site Conditions



- 100% Clonal Rootstocks
- Most Resistant To Crown Gall
- Proven Most Productive



Industry Leading  
Selections of Rootstocks  
& Budded Trees

*67 Years of Experience Growing Quality Trees  
using Industry Leading Advancements*



On-Site Tissue Culture Lab



Ellepot™ System  
For Superior Roots!

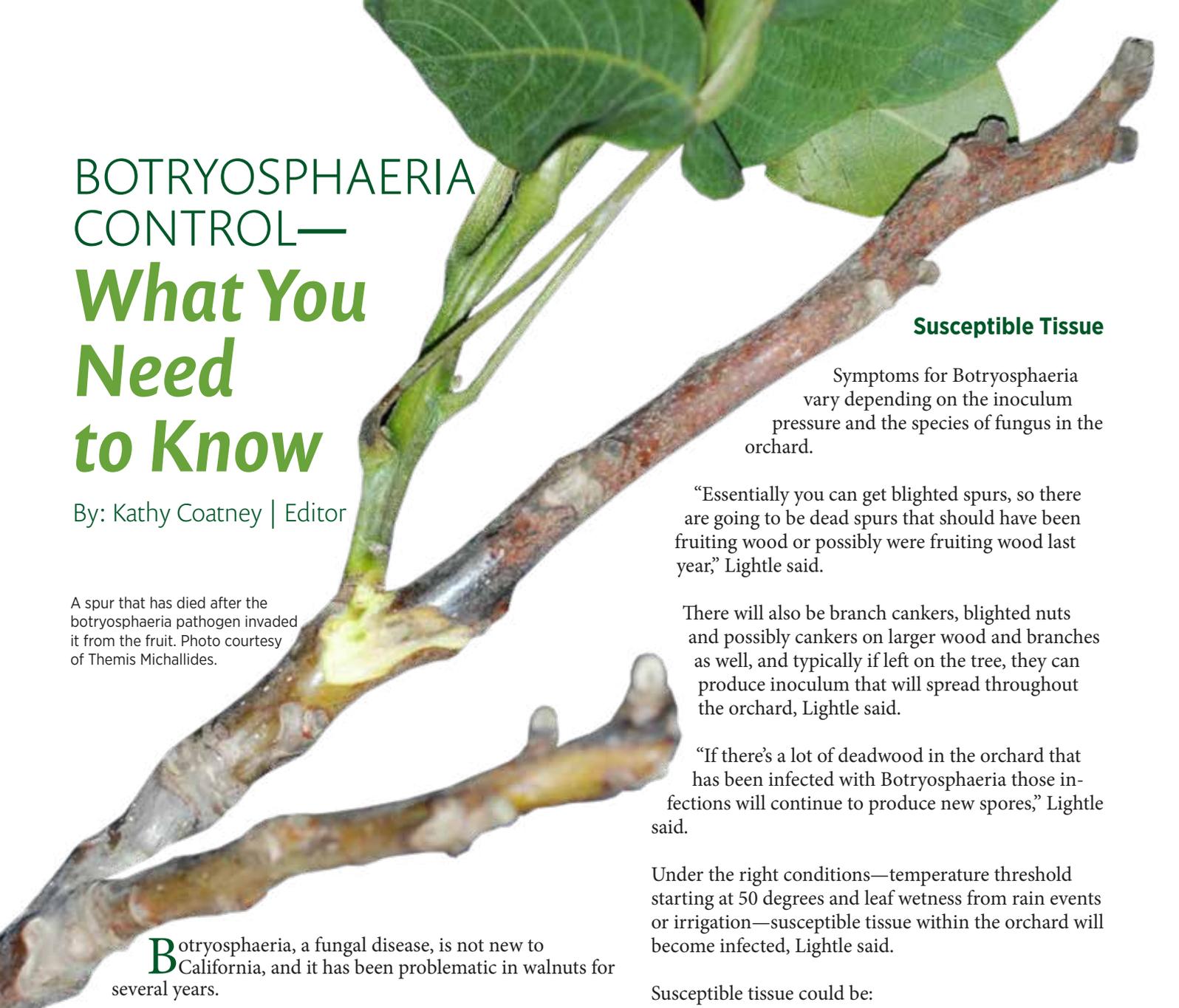


Experienced Field Reps To  
Serve You At Your Planting Site

**530-674-1145**  
*sgtrees.com*

Your Source for:  
Olives, Cherries, Apples, Pears, Peaches,  
Prunes, Nectarines, Apricots & Plums

View our Videos at: [https://www.youtube.com/channel/UC4X-8luGuAbIB1IHg-6-s6A?view\\_as=subscriber](https://www.youtube.com/channel/UC4X-8luGuAbIB1IHg-6-s6A?view_as=subscriber)



# BOTRYOSPHAERIA CONTROL— *What You Need to Know*

By: Kathy Coatney | Editor

A spur that has died after the botryosphaeria pathogen invaded it from the fruit. Photo courtesy of Themis Michallides.

**B**otryosphaeria, a fungal disease, is not new to California, and it has been problematic in walnuts for several years.

Dani Lightle, University of California Cooperative Extension (UCCE) orchards advisor for Glenn, Butte and Tehama counties said, she thinks what happened is a combination of different orchard management changes have occurred that have been beneficial for this particular pathogen.

It's most likely due to a combination of factors:

- Higher humidity
- More cuts from mechanical hedging and pruning
- Older blocks where deadwood has accumulated
- Increased walnut scale

All of these different factors have built on top of each other and created a situation that has encouraged the growth of Botryosphaeria, Lightle said.

“So you start to get these situations that are really hard to tease apart any one given factor, but there's probably lots of different pieces and parts that are playing a role,” Lightle said.

## Susceptible Tissue

Symptoms for Botryosphaeria vary depending on the inoculum pressure and the species of fungus in the orchard.

“Essentially you can get blighted spurs, so there are going to be dead spurs that should have been fruiting wood or possibly were fruiting wood last year,” Lightle said.

There will also be branch cankers, blighted nuts and possibly cankers on larger wood and branches as well, and typically if left on the tree, they can produce inoculum that will spread throughout the orchard, Lightle said.

“If there's a lot of deadwood in the orchard that has been infected with Botryosphaeria those infections will continue to produce new spores,” Lightle said.

Under the right conditions—temperature threshold starting at 50 degrees and leaf wetness from rain events or irrigation—susceptible tissue within the orchard will become infected, Lightle said.

Susceptible tissue could be:

- The hull of a nut
- A wound on the branch or spur where the peduncle of the nut was attached
- A pruning wound
- A feeding injury from scale

Spring rains could start the process with the right conditions, Lightle said.

“Say we got a rain for a few hours in the morning, and it's a warm rain, absolutely that would be the right conditions,” Lightle said.

## Decreasing the Inoculum Load

There are different options for decreasing the inoculum load from an orchard depending on the level of pressure.

*Continued on Page 18*

# **K-PHITE® 7LP + SIZER®**

---

## **FOR POST-HARVEST APPLICATION TO CONTROL BOTRYOSPHERA, PHYTOPHTHORA AND TO SUPPORT BUDWOOD MATURATION.**

### **POST HARVEST APPLICATIONS CAN BE PARAMOUNT TO A SUCCESSFUL CROP IN THE FOLLOWING YEAR.**

The use of **K-PHITE 7LP** Systemic Fungicide/Bactericide, in combination with **SIZER 4-20-22** Urea, Di Potassium Poly Phosphate, is research-proven to support healthier and more vigorous spring growth and considerably stronger bloom set when compared to other programs.



**K-PHITE 7LP** is the only fully systemic material to have been rated ★★★★★ for the treatment of *Botryosphaeria* by the University of California. Of the top rated materials for *Botryosphaeria*, **K-PHITE 7LP** is the only one that has the ability to provide excellent control of *Phytophthora*. **K-PHITE 7LP** is classified as a FRAC 33 with regards to resistance, giving it one of the higher ratings in the industry. As a patented linear polymer molecule, other marketers may claim to be equivalent to **K-PHITE 7LP**, but they simply are not.

**SIZER 4-20-22** is a foliar nutrient with one of the highest solubilities among P-K fertilizers, five times that of mono-potassium phosphate or potassium nitrate, and the efficiency of nutrient uptake is directly correlated to solubility. By effectively placing both P and K into the tree system, **SIZER 4-20-22** supports the maturation of the trees' budwood, resulting in a stronger, more receptive bloom in the spring. And everyone knows that immature green whips produce weak, if any blossoms.

Rates of 3 quarts/acre of **K-PHITE 7LP** combined with 4 quarts/acre of **SIZER 4-20-22** applied twice during the post-harvest period have been proven to dramatically improve the strength of bloom along with providing control of both *Botryosphaeria* and *Phytophthora* in a low cost combination.

**Manage Today for Tomorrow's Results.** *Plant Food Systems is an innovative pioneer, leading manufacturer and international distributor of foliar macro and micro nutritional solutions for tree nuts and crop health bactericides for all crops under environmental and pathological stress. **K-PHITE 7LP** and **SIZER 4-20-22** contain patented technology and are themselves the product of groundbreaking molecular research, and contain unique Phosphorus, co-polymeric phosphate and phosphite molecules.*

---

**For more information including research results and scientific publications, contact:**

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

**(559) 731-1267 • [mbrady@plantfoodsystems.com](mailto:mbrady@plantfoodsystems.com)**

K-PHITE®7LP and SIZER® are registered trademarks of Plant Food Systems, Inc.



Continued from page 16

**Low Pressure:** An orchard with low pressure would do a maintenance treatment with a single spray application done in late June/early July. This has been shown to be the most effective management for low pressure, Lightle said.

But even with low levels of inoculum in the orchard, it's important to continue to prune out deadwood and dispose of the brush by removing the prunings from the orchard and burning them, Lightle said.

**Medium Level:** With medium pressure, the deadwood also needs to be pruned out and removed from the orchard and burned. A fungicide treatment program is also recommended—spray timings of mid-May, mid-June and mid-July, Lightle said.

**High Level:** With high levels of inoculum forgo removing the prunings. Instead, chip and leave them in the orchard.

“There’s not necessarily a reason to push and burn at that point,” Lightle said.

Treatment for orchards with high levels of inoculum would be to use a full calendar schedule—a mid-June/mid-July/mid-August spray application.

## Leaf Wetness Model

Another option that has been developed is the leaf wetness model (LWM), Lightle said.

Using the leaf wetness model may mean fewer sprays than just doing the calendar spray applications, depending on the weather, Lightle said.

“The idea is that you use it (LWM) to help determine when you’re at highest risk of infection,” Lightle said, and determine when a spray application is needed.

LWM takes into account the temperature and how long the leaf had been wet, then breaks down whether it is a low, medium or high risk level, Lightle said.

Infection from pruning wounds that shows the canker developed and the bumpy surface is where the pycnidia developed.



[com/walnuts/diseases/the-latest-on-managing-bot-canker-and-blight-in-walnut-2016-research-updates/](http://www.westcoastnut.com/walnuts/diseases/the-latest-on-managing-bot-canker-and-blight-in-walnut-2016-research-updates/)

The goal of using the leaf wetness model is that growers might avoid a spray application, Lightle said.

“I think it’s much easier to go on a calendar schedule, and since the leaf wetness tends to not be more efficacious than that in our data, the easy way to just ensure that you’re on a good program is to do a mid-May, mid-June, mid-July,” Lightle said.

## Available Fungicides

There are several fungicides that are efficacious on *Botryosphaeria*, Lightle said.

“The fungicide efficacy tables are updated every year by the plant pathologists, and they basically are just screenings of the different fungicides that are registered and how well they work on different diseases. It will have the full list of the ones that are efficacious,” Lightle said.

More information can be found on fun-

“You would spray when you come out in a medium or at a high risk level, unless you’re still within the residual period from the last fungicide application,” Lightle said.

For more information on the leaf wetness model go to: <http://www.sacvalleyorchards.com>.

Continued on Page 20

**COMPLETE PLANTS**  
Built to Fit Your Needs

**Wizard**  
MANUFACTURING INC.

WizardManufacturing.com  
info@wizardmanufacturing.com  
530.342.1861 • Ca Lic. # 1036445

# LONG-LASTING + BURNDOWN CONTROL OF 51 TOUGH BROADLEAVES



**Pindar<sup>®</sup> GT**

**HERBICIDE**

**Pindar<sup>®</sup> 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.

 **CORTEVA<sup>™</sup>**  
agriscience

Agriculture Division of DowDuPont

Visit us at [corteva.com](http://corteva.com)

®™Trademark of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners. Always read and follow label directions. ©2018 Corteva Agriscience

Continued from page 18

fungicide efficacy at this link: <http://ipm.ucanr.edu/PDF/PMG/fungicideefficacytiming.pdf>

## Resistance

“Botryosphaeria is actually really interesting in that genetically there are lower risks of resistance development by Botryosphaeria species to a fungicide,” Lightle said.

But there’s a big but to this, Lightle stressed. “All of the other species out in your orchard are still liable to develop resistance.”

Since there are a broad range of materials that work well on Botryosphaeria, it’s still a good idea to rotate chemistries, Lightle said.

## Pruning With Bot in Mind

Themis Michailides, a plant pathologist with the University of California (UC), Davis, UC Kearney Research and Extension Center has looked at two different timings for pruning, one was in the fall and one in the winter, Lightle said.

The infection rates (canker in shoots) from winter pruning was 78 to 99 percent compared to 28 to 75 percent in the

fall pruned shoots.

Higher infection rates were seen in three and four year old wood compared to one and two year old wood, and these results further confirmed 2015 findings showing longer cankers in older wood.

It is suspected that the hollow pith inside older walnut branches provides a haven for Botryosphaeria infection, spore germination, and pathogen growth, Lightle said.

If pruning or hedging is planned this year, the recommendation is to do so as early as possible in the fall when no rain is forecast. Ideally, deadwood removal should be done during the dry summer months, Lightle said.

## Mechanical Pruning

Lightle thinks that the tight spacings many walnut orchards have may play a role in problems with botryosphaeria.

Denser canopies are linked to greater humidity, and after it’s rained there could be longer leaf wetness.

“I think one of the other really big players is that when we started doing these hedgerow types of plantings we began to rely very heavily on—and in some cases exclusively—mechanical pruning and hedging,” Lightle said.

Mechanical pruning and hedging creates large numbers of indiscriminate cuts. Oftentimes deadwood is not gone through and cleaned out, so a lot of inoculum is left in the orchard, Lightle said.

“You’ve got a lot of inoculum, and you have a lot of susceptible places to become infected,” Lightle said.

## Managing Botryosphaeria

Fungicide sprays alone won’t solve the problem, Lightle said. “You still need to go through and get rid of the large deadwood.”

“For most orchards it’s going to be impractical to worry about every dead spur because you’re going to pay way too much to get it out. But if you can just spend a few minutes and focus on the large deadwood, that’s going to be a big help in starting to get the inoculum load under control,” Lightle said.

Lightle said good management practices such as ensuring sprinklers are keeping trees dry, pruning when wounds are less likely to become infected and keeping scale under control will help form a solid management approach.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

**SOIL PRO**  
ORCHARD AND PLANT SOLUTIONS

- Naturally out-competes soil pathogens
- Reduce water usage
- Controls Gall and Canker
- Cost effective
- Healthier plants
- Stimulates Plant's natural immunity

Our proprietary blend of naturally occurring bacteria will help to restore your soil back to it's optimal condition. Soil Pro is uniquely designed to combat harmful soil pathogens and naturally bring your most valuable asset, your soil, back to working for you instead of against you.

**SOIL PRO** Rick Reynolds  
Sales Cell: 510.334.4711  
Developed By Micro-Tes Inc

PRE-CLEANING • HULLING • DRYING • SHELLING • RECEIVING

# MAXIMIZE EFFICIENCY

and Reduce Processing Costs with

## GROSSI COMPLETE SYSTEMS

Pre-Cleaning • Drying • Shelling  
Hulling • In-Shell • Packaging



Our focus is on designing and building integrated complete processing systems that **maximize efficiency** and **reducing processing costs.**



We are experts in the walnut industry and will ensure you get the best system at the best value.



**GROSSI**  
FABRICATION INC.

**CONTACT US  
TODAY  
TO GET A QUOTE  
OR SCHEDULE A  
SITE VISIT**

*Contact Us Today*

3200 TULLY ROAD, HUGHSON, CA • [Grossifabrication.com](http://Grossifabrication.com)

209.883.2817

# THE IMPORTANCE of Continuing Education *for Farmers*

By: Jenny Holtermann | Contributing Writer



## Take your seat at the table

In order to still be in agriculture these days, you must be a resilient person. Let's face it, sometimes it feels as if government is forcing agriculture to exit out the back door. Farmers are eternal optimists. If you weren't, you wouldn't still be in this business. Farming is hard. Sacramento and Washington D.C. seem to be throwing every regulation and law they can think of towards the agriculture industry. The best part is, we come out above it and are stronger businessmen and women because of it. The worst part though, is that we have proven we will continue to thrive regardless of what manure they throw in our direction. They keep chucking it, and we keep trekking forward.

## California Number 1 in Agriculture

Many counties have recently reported their agriculture values for the 2017 crop year and the top counties all increased their agriculture production values. California farmers are able to continue to grow agriculture products with higher quality and higher food safety standards. We are an industry that continues to thrive, even with increased regulations, taxes, labor laws and lack of water. California remains the top agriculture state in our nation by a landslide. We do it with less inputs and more regulations.

## Are You Involved

With the onset of the Sustainable Groundwater Management Act, are you involved with your local Groundwater Sustainability Agency to provide feedback and ideas on your local Groundwater Sustainability Plan? It is critical to be engaged in these plans so you are prepared and able to plan for your future.

Chlorpyrifos has recently been banned by federal court. The United States Court of Appeals for the 9th Circuit ruled that the Environmental Protection Agency needed to ban the chemical. Soon products like Lorsban will have the registrations cancelled in accordance with the court ruling. How will farmers be able to tackle those tough pests, keep their farms economically viable and stay compliant with regulations?

The list could go on with burdens that farmers face.

## Get Educated

We have to keep moving forward or we will get stuck in the

past. Stay engaged, get educated, be in the know, stay up to date... we've all heard it a thousand times. As harvest ends, winter comes and things start to slow down on the farm, kind of. Farmers then start to find themselves at field days and conferences. In my house we refer to December through March as conference season. It really is a season where commodity boards, agriculture organizations and affiliated groups organize events for farmers to gather and learn.

There is always something new to learn. Whether that be a new technology, new research study, irrigation systems, diversification, the latest in estate planning or the onset of a new regulation, there is always going to be something that agriculturalists need to learn to advance their farm. Without being open to new things and ideas, you are staying stagnant and closing yourself off to the new advances in technology and science that are available in this day and age. Farming really is a science, it isn't something you can do based off of a calendar. Science and our environment are constantly changing and we need to be able to adapt and learn with it. You also need to know what is applicable to your business and your budget.

You may be a Pest Control Advisor, Qualified Applicator or Private Applicator and are already required to attend hours of continuing education to keep your license current. You may be on your local Farm Bureau Board of Directors, Western Growers Board, or maybe a committee member of the Almond Board of California, American Pistachio Growers or Western Agricultural Processors Association. These are all great examples and I know there are even more organizations doing a great job to

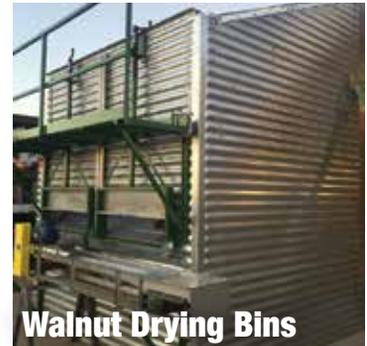
*Continued on Page 24*



# Kraemer & Co. Mfg., Inc.

## Nut Drying & Storage Facilities

**Almonds • Pecans • Pistachios • Walnuts**



- 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](http://www.kcomfg.com)



*Continued from page 23*

advocate and promote the agriculture industry. By attending the meetings and conferences they organize you are advancing your knowledge to help advance your farm into the future so that there is a future for the next generation. These organizations were founded and led by farmers and agriculturists looking for a means to keep the agriculture industry relevant, strong and increase the well being of the American farmer.

At the meetings these organizations sponsor, they cover all these issues in detail with qualified speakers and researchers. They have the time invested to help farmers advance their businesses. Without farmers advancing and growing, these organizations wouldn't be able to strive to do what they do. It is because of farmers and agriculturists being involved and engaged with agriculture boards that enables these groups to promote and protect the agriculture industry.

### **Education Sources**

Aside from commodity and agriculture boards and organizations there are marketing companies and industry

magazines that coordinate field days to centralize information to growers.

West Coast Nut organizes a nut conference in three areas of the state, there is also a Walnut Trade Show, Almond Day, and new this year is a Kern Ag Day. These conferences and field days are great for the busy farmer who can't take off for a few days or a week to attend commodity board meetings far away. These Nut Conferences are in close proximity to where nut production happens, making it easy for farmers who are involved in the day-to-day operations to escape for part of a day. When you spend most of your day managing, driving tractors, checking irrigation and trying to stay compliant on government reporting it can be hard, this makes it difficult to get away for even part of the day. It is especially difficult when you know you will be sitting in workshops and learning about the increasingly more burdensome regulations that are coming down the pipeline and what seems like the stripping of your own property rights.

### **Make Time to Attend**

But if we don't make the time to attend these workshops and conferences and

hear about these issues, we will become so disengaged, we won't be able to farm anymore. As a fourth generation California farmer myself who is trying to raise the next generation, it is most definitely discouraging to constantly hear of the increasing regulations that are being put on agriculture. I want there to be an agriculture industry for my children to be part of, the same way the generations before them were. If we don't hit these issues head on, we are choosing to be defeated. By being active members of organizations like Farm Bureau and Western Growers, you can get your voices heard and act on issues hurting your farm. Attend those field days and workshops pertaining to your crop and stay fluent on issues and research to better advance yourself and your business. You need to take your seat at the table to ensure your concerns are met. If you're not at the table, you're on the menu.

Jenny Holtermann, writes an agriculture blog 'Almond Girl Jenny' and farms almonds with her family.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

# **Activate™** **Nut Industry's Gold Standard** **for Post Harvest Fertility**



## **Why Activate™?**

- Highly concentrated bacteria, guaranteed species analysis
- Naturally occurring root colonizing bacteria, not genetically modified
- Stimulates root and plant growth
- Enhances nutrient cycling and a reduction in nitrogen needs
- Reduces leaching of nutrients



*Product Manufactured by Natural Resources Group*

34284-B Road 196  
Woodlake, CA 93286

Tel: 559.564.1236  
Fax: 559.564.1238

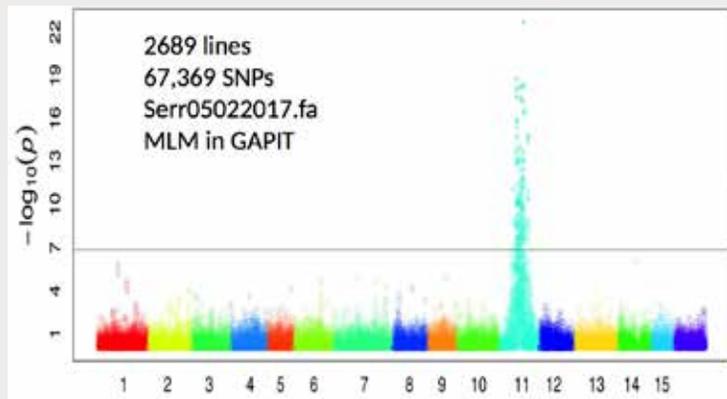
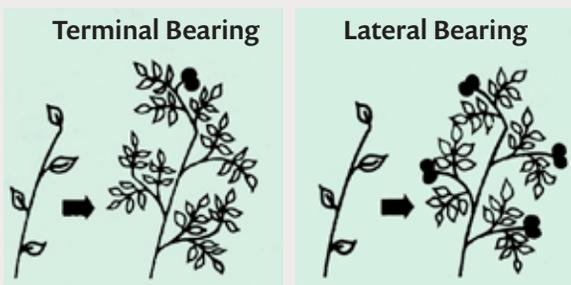
info@callnrg.com  
www.callnrg.com

# NEW RESEARCH ON WALNUT VARIETIES *Shows Promise*

By: Julie R. Johnson | Contributing Writer

## Lateral bearing: a major, predictable yield component

The ability to predict lateral bearing at the seedling stage is one of the many goals of Pat J. Brown's UC Davis Walnut Breeding Program's DNA research.



One spot on chromosome 11 controls lateral bearing

UC (University of California) Davis Walnut Improvement Program's DNA research is on the cutting edge as the team works to provide growers with new and improved walnut varieties.

The leader of the team, Pat J. Brown of the UC Davis Plant Sciences Department, said they have been working with DNA information to predict which crosses will provide better disease and pest resistance, yield and kernel quality. Other key traits of interest include leafing, flowering, harvest dates, kernel color stability across years and locations, and resistance to Cherry Leaf Roll Virus.

"An example of our DNA research is predicting lateral bearing trees which provide better and earlier yield for growers," he added.

Since Brown took over the reins from Chuck Leslie in 2017, he has been working to integrate genomic and imaging data into the Walnut Improvement Program. Leslie, who has over 30 years experience in walnut breeding, genetics and production, is still a key contributor to the breeding program, overseeing the tissue culture lab and advanced selection grower trials, among other things.

Several collaborating groups at UC Davis were the first to sequence the genomes of commercial walnuts varieties-Chandler and Serr, Brown said.

In concert with other walnut research funded by the California Walnut Board,

## Biotic and Abiotic Threats to Walnut Production

### SCION

Husk Fly



Bob Van Steenwyk/ Steve Seybold

Botryosphaeria



Themis Michailides

Blight



Jim Adaskeveg

PFA



### ROOTSTOCK

CLRV



DNA enabled walnut rootstock research is a collaboration between the USDA, UC Cooperative Extension, UC Davis and UC Riverside.

the DNA based predictions in the breeding program could accelerate and vastly advance work on breeding of improved walnut varieties.

An important point for breeding, Brown said, is that researchers don't need to know what the gene is or understand how it works, they just need to be able to predict the outcome, such as whether the tree will be terminal or lateral bearing.

"As we plant thousands of nuts each year, through genotyping we will not even bother planting nuts that are predicted to be terminal bearing," he added. "This way, we don't have to waste time and space planting seedlings and trees that don't produce the results we want."

Genotyping thousands of nuts each year can be a daunting task, and one that must be cost-effective. Thankfully the HiSeq4000 sequencers at the UC Davis Genome Center enables significantly

faster sequencing and reduced per-base-costs.

The program released walnut variety "Durham" in 2016 and another new release is just around the corner.

"We don't have a name for it yet," Brown said. "But the 'mom' is Chandler and the 'dad' is Solano. Nut quality is very similar to Chandler, but harvest date is at least 10 days earlier than Chandler" He noted many growers already have a lot of acreage in Chandler, saying the new variety would be a "nice compliment."

The focus on the varieties in the trial pipeline has been earlier harvest dates, better color stability, and pest and disease resistance.

"Walnut blight has been an important focus for a long, long time and creating more blight resistant varieties has always been a long-term goal," Brown said.

## DNA Research—Today, Tomorrow

DNA marker data enables researchers to take chances on parent lines and start using them earlier than they would otherwise.

"The traditional way of doing things is to wait for five or ten years to get performance on a tree or line before selecting it or using it as a parent," Brown said. "Now that we have marker data, I think we will have more confidence in our choices earlier on in the lifespan of the tree. By speeding up both the selection of parents, and the selection of progeny, hopefully the development and release of new varieties will become much more efficient."

The walnut breeding program now has 50 years of data to work with, he added, "lots and lots of data." Researchers have collected DNA from thousands of trees

*Continued on Page 28*



**SUTTER BUTTES  
MERCANTILE LLC**

**MONTANA  
TRACTOR & MACHINERY**

**Offering Annual Contracts**

**Individual Payment Schedules**

<https://www.facebook.com/sbmercantile.net>

[www.sbmercantile.net](http://www.sbmercantile.net)

**Custom Harvesting Available**

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

**530.846.5720**

# Breeding Scheme

1500 new nuts per year



100%



Seedling blocks



< 1%



Selection blocks



- Own-rooted *J.regia*
- Unreplicated
- 6' spacing



Parents of controlled crosses

- Grafted onto Paradox
- Replicated
- 20' spacing

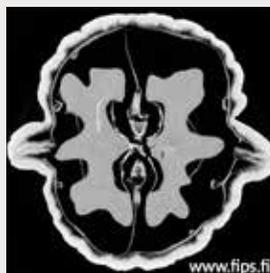
Grower trials release

Integrating DNA information into the walnut breeding program promises higher efficiency than past practices.

Better understanding of interactions affecting kernel color and quality



Kernel color variance within genotypes due to differences in harvest date, pre-/ post-harvest conditions



3D structure of shell, kernel, and packing tissue determine ease of removal (% halves)

*Continued from page 27*

and they have marker information from those trees.

“We now have markers that make accurate predictions, of lateral bearing for example, in that data set,” Brown states. “So, where we are today is that we are using that information to choose seedling trees. However, there is an iterative learning process here—predict, make mistakes, learn from your mistakes—and the learning never stops.”

He describes the work his team is doing as being “at the starting gate,” and is confident it will help in developing new and better varieties.

“The only question in my mind at this point is how quickly,” Brown said.

As for the future of the DNA program, he believes taking on the problem of blight will be a factor.

“Blight is such a big concern. If copper were to be taken away tomorrow in the fight against blight, everyone would be in big trouble,” he added. “Blight is a priority in our research.”

He believes understanding the genetic

Pat J. Brown, leader of the UC Davis Walnut Breeding Program DNA research team believes understanding the genetic control of kernel color in walnuts is extremely important because “at the end of the day that is what determines the size of the growers paycheck.”

*Continued on Page 30*

# CONSUMERS AROUND THE GLOBE ARE BUYING CALIFORNIA WALNUTS

Over 30 billion California walnuts have made their way into export markets for snacking, commercial and home baking, trail mixes, savory sauces, restaurant menus, ready-to-eat meals and more this past crop season.

Marketing programs are the key to building consumer demand to expand distribution and raise consumption.

## Top 10 Export Markets:



Currently, the California Walnut Commission (CWC) conducts targeted marketing programs in eight countries throughout Europe and Asia, including an EU regional industrial program, positioning California walnuts distinctive quality, taste, versatility and nutritional benefits. Industry growers, handlers, and the CWC have made great strides by working together and will continue building demand in an ever-expanding global market.

## Here are the numbers:

Walnuts were the 4th leading export commodity from California.<sup>1</sup>

Every \$1 spent in California walnut export promotion returned over \$26 in export revenue to the industry.<sup>2</sup>

Each \$1 in FAS-taxpayer support for California walnuts export promotion generated over \$15 in tax revenue creation.<sup>2</sup>

Spending on export promotion in 2017 created 2,682 jobs.<sup>2</sup>



**66%** of the California walnut crop was **exported** in the **2017/18** crop year.



walnuts.org

<sup>1</sup> California Agricultural Statistics Review 2016/2017 by CDFA

<sup>2</sup> Economic Evaluation of the California Walnut Commission's Export Promotion Programs: An Analysis of the Direct and Indirect Impacts, January 2018, Harry M. Kaiser, Cornell University



*Continued from page 28*

control of color is extremely important, because “at the end of the day that is what determines the size of the growers paycheck.”

### Rootstock Research

Brown said rootstock research is a newer part of the program.

“It got started as a scion-breeding program. However, the amount of time and effort we have put into rootstocks keeps increasing,” he says.

The research is a collaboration with many other walnut programs in the UC

system, and up and down the Sacramento and San Joaquin valleys.

“We’ve got different rootstocks that are good for different things—VX211 is good for nematodes and RX1 is good for Phytophthora,” Brown said. “The next step is to stack those resistances so we can have one rootstock that is good for everything, or at least for a larger number of things.”

This research is enabled by a new United States Department of Agriculture (USDA) Specialty Crop Research Initiative-funded project lead by Andreas Westphal, a UC Riverside nematologist based at the Kearney Agricultural Research and Extension Center.

DNA research activities for rootstock and scion varieties of walnut are closely related.

“We can use the DNA information we gather to strategize development of both rootstock and scion varieties,” Brown says.

His enthusiasm into DNA research in walnut and pistachio is evident and if that is any indication of the future of the program, much success is in store.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

**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** BAKERSFIELD (661) 588-8675 VISALIA (559) 625-5152

**NEW!**

# CIDETRAK<sup>®</sup>

## CMDA+NOW MESO<sup>™</sup>

FOR CODLING MOTH & NAVEL ORANGEWORM CONTROL

Only 20 dispensers/acre  
for moderate population abundance

*The Season  
Isn't Over!*



**2-FOR-1**

Codling Moth,  
*Cydia pomonella*

Navel Orangeworm,  
*Amyelois transitella*



**THE ONLY MATING DISRUPTION** product on the market today approved for organic use!

**Features:**

**Benefits:**

<ul style="list-style-type: none"> <li>High performance, dual mating disruption proven in university and government trials</li> </ul>	<ul style="list-style-type: none"> <li>Significantly reduces damage with a properly managed approach</li> </ul>
<ul style="list-style-type: none"> <li>Codling Moth mating disruption reduces NOW access</li> </ul>	<ul style="list-style-type: none"> <li>Additional "dual protection" from NOW infestation</li> </ul>
<ul style="list-style-type: none"> <li>Dramatic reduction of dispenser rate <u>and</u> "no moving parts"</li> </ul>	<ul style="list-style-type: none"> <li>Significantly less labor, less cost <u>and</u> "no mechanical worries"</li> </ul>
<ul style="list-style-type: none"> <li>Full-season "temperature dependent A.I. release"</li> </ul>	<ul style="list-style-type: none"> <li>Proper pheromone release synchronized with NOW adult action</li> </ul>
<ul style="list-style-type: none"> <li>Non-toxic</li> </ul>	<ul style="list-style-type: none"> <li>No residues, MRL's or worker safety to worry about</li> </ul>
<ul style="list-style-type: none"> <li>Patented, high performance hanging device</li> </ul>	<ul style="list-style-type: none"> <li>Fast application, less labor and no branch scarring</li> </ul>
<ul style="list-style-type: none"> <li>Apply with a simple pole applicator</li> </ul>	<ul style="list-style-type: none"> <li>Fast, low cost application</li> </ul>
<ul style="list-style-type: none"> <li>Personalized ready-to-use carrier pack</li> </ul>	<ul style="list-style-type: none"> <li>Convenient application, better inventory control - less material/less labor</li> </ul>



Ready-to-use carrier pack



The BEST Monitoring Systems for CM & NOW



CIDETRAK<sup>®</sup> CMDA + NOW MESO<sup>™</sup> Dispensers in use

**IMPORTANT: ALWAYS READ THE LABEL**





# FARM TAX 2018: A Changing Landscape

By: Jeff Bowman, CPA, Grimbleby Coleman CPAs

The Tax Cuts and Jobs Act (TCJA) hit the news in late December 2017, but it has taken the better part of 2018 to understand the nuances and complexities of this new law. The IRS released guidance about the new law in late summer, but many portions remain unanswered. The agency continues to work on additional guidance that we hope will bring clarity—but in the meantime, let's take a look at three key areas for production agriculture that will impact your 2018 tax year.

## Farm Depreciation and Increased Bonus Depreciation

The TCJA includes an extension of bonus depreciation rules—otherwise scheduled to begin phasing out in 2018—and increases the deduction from 50 percent to 100 percent bonus depreciation in the year of purchase. For the first time, bonus depreciation applies to used (in other words, not brand new) assets.

Let's consider the 2018 purchase of an orchard in full production. A portion of the purchase price should be allocated to the value of the trees, and that portion could be fully expensed using the new bonus depreciation rules. This provision is not permanent, but we do have until 2022 before it begins to phase out.

The special rule under Section 168(k)(5) to take bonus depreciation on trees or vines the year they were planted was also increased from a 50 percent to a 100 percent deduction.

On a side note, several other depreciation changes have taken a backseat to bonus depreciation. New farm machinery or equip-

ment can now be depreciated over five years instead of seven. The 150 percent calculation method for farm assets increased to 200 percent, so assets will be weighted to depreciate faster in their early years. And the well-known Section 179 first-year expensing rules increased from \$500,000 to \$1 million of potential deduction.

## Section 263A and Preproductive Development Costs

The requirement under Section 263A to capitalize the costs of developing and caring for an orchard or vineyard during the preproductive years has long been a thorn in the side of many farmers. These costs are significant, and paying them without a current tax deduction has been a challenge for many clients. Finally, some relief is in sight.

Under the revamped code Section 263A, growers with gross revenues under \$25 million may expense cultural costs accrued during a young orchard's pre-productive period as ordinary farm operating costs. Trees and vines must still be capitalized, as well as the associated costs to plant and get them in the ground. But keep in mind the previously mentioned election to take bonus depreciation on those costs in the planting year.

Of course, tax law is never easy. To determine if a grower is under the \$25 million gross income limit, we must take into consideration aggregation rules that may combine the gross income of related entities.

Additionally, the exception is not avail-

*Continued on Page 34*

# Key Dollar Cab

*Protecting Growers Since 1982*

## Introducing our John Deere 5115ML Orchard Cab

- 100% Stainless Steel Cab Construction
- ½" Orchard Glass Windows
- Powered Dual Stage Charcoal Pressurization System
- The Most Orchard Friendly Shape on the Market



**“Celebrating 30 Years of Orchard Cab Innovation”**

[www.keydollarcab.com](http://www.keydollarcab.com)

**(800) 481-0876**



*Continued from page 32*

able for tax shelters or (more critically) any arrangement in which 35 percent or more of losses are allocated to limited investors. For example, farm investment limited partnerships, or LLCs, that raised capital by selling limited partnership interests may find they are still required to comply with Section 263A, no matter their amount of gross receipts.

We'll need to carefully determine which farm entities benefit from this new exception to the Section 263A rules. Remember, California continues to apply the prior version of the law because it has not conformed to this provision, so additional record keeping is needed for state

tax compliance.

We hope the IRS will offer guidance on how to transition if a grower is no longer subject to Section 263A under the new law but has capitalized costs on their books for an orchard or vineyard that is not yet in production. Additionally, taxpayers who previously elected out of Section 263A (and paid the price with less favorable depreciation rules) await guidance on whether there will be a way to undo that prior election.

### The Arrival of New Section 199A

Many growers and ag entities were quite familiar with the old Section 199 Domestic Production Activities Deduction (DPAD). It has been retired and replaced with the new Section 199A, which provides a 20 percent deduction on qualified business income from pass-through entities and individual activities. As an aside, this new provision does not apply to C Corporations, but that type of entity did get its own new flat tax rate of 21 percent.

The Section 199A deduction, in general, will result in a deduction against the taxable income of the individual owners of the activity, so partners or S Corporation shareholders will receive the benefit on their personal tax returns. A 20 percent deduction of the net income of a business activity will be applied to reduce net taxable income, and likely will provide substantial benefits for many taxpayers. The deduction will only reduce ordinary income, not capital gains.

As you may have guessed, a number of limitations apply—many of which are beyond the scope of this article—but we'll highlight several for your discussions with your tax advisors.

For individuals with taxable income in excess of \$315,000 (married, filing joint taxpayer), the limitations begin to reduce and eventually eliminate any deduction. First, the activity must not be a specified service trade or business. In agriculture, potentially disqualifying examples include consulting activities (if not part of the sale of other goods and services) and dealing in certain types of commodities.

In general, this would not impact production agriculture and most processing activities. Another issue beyond the scope of this discussion is whether rental activity rises to the level of trade or business—the IRS often disagrees on this—and whether self-rental activities can qualify.

A more onerous limitation—again, only if income is enough to trigger these limits—is that the 20 percent deduction is limited to the greater of 50 percent of gross wages paid OR 25 percent of gross wages paid plus 2.5 percent of the unadjusted cost basis of certain types of assets (equip-

*Continued on Page 36*

**CALL TODAY TO  
RESERVE HIVES  
FOR 2019 ALMOND  
BLOOM**



**RASMUSSEN  
FARMS**

QUALITY HIVES FOR  
QUALITY GROWERS

PROVIDING  
POLLINATION SERVICES  
THROUGHOUT  
CALIFORNIA

SPECIALIZING IN  
ALMONDS AND  
CHERRIES

FAIR PRICES

TIMELY PLACEMENT  
AND REMOVAL



3400 MILLS RD  
GUSTINE, CA 95322

209-596-0047  
E: RASMUSSENFARMS@GMAIL.COM  
WWW.RASMUSSENFARMS.ORG

**SORTEX® F with  
BioVision™** — Now  
available in two sizes.

The **SORTEX® F** features industry leading throughput that nearly doubles that of a similar sized competitor model. In combination with SORTEX BioVision™ inspection technology, the SORTEX F offers nut and dried fruit processors 4-in-1 detection of **serious defects**, color defects, shell and foreign materials in just one optical sorting platform.

**Find out more.**

**T+ 1 209 983 8400**

[sortexsales@buhlergroup.com](mailto:sortexsales@buhlergroup.com)

[www.buhlergroup.com/sortex-f](http://www.buhlergroup.com/sortex-f)



Continued from page 34

ment, not land). We can neatly tuck limitations into a short paragraph for this article, but the details of how this will apply to this calculation—and how much guidance the IRS will provide—are quite lengthy.

For example, what if multiple entities have been structured so that a labor company employs workers who then manage the land of other farm entities? Will the 20 percent deduction be available on the crop income from land-holding entities that do not actually pay wages themselves?

Just in case that wasn't confusing enough, there's another wrinkle if you receive income from sales to a cooperative. The calculation now involves a potential deduction passed from the co-op to you, if the co-op chooses, and then a lesser calculation on your own income but with a reduction based on wages.

What if you sell to both co-op and other non-co-op buyers? Get your spread-

sheets warmed up, because there will be some cost allocations to make to determine the net income and resulting 20 percent deduction on both co-op and non-co-op portions of your overall income.

Given the potential limitations and questions, we suggest the following as discussion points when consulting with your tax advisors on Section 199A:

- Will taxable income level trigger these limitations?
- Is our type of business activity disqualified from this deduction?
- Do we have sufficient W-2 wages and/or basis in assets to maximize the 20 percent deduction?
- Do we sell to a co-op, and how will that calculation impact our deduction?
- Will the grouping rules of the recently proposed IRS regulations allow us to combine activities and work around the wage limitations?
- Is our rental activity considered self-rental, and does the rental qualify for the deduction?
- Do we expect losses from any qualifying activities, and how will

those losses reduce our 20 percent deduction?

### Final Thoughts...

The new tax law contains much more than just the three areas highlighted above. The new interest expense limitation rules and changes to net operating losses are important considerations. You'll need coordinated planning to layer these new rules into existing farm tax planning concepts like income averaging or crop deferral strategies.

A number of items in this article are based on proposed IRS regulations, meaning that their final form may yet change again. Given the state of change, and the many nuances that can't be addressed in this space, it is imperative to plan ahead with your ag tax advisors before year end to understand how this new law may affect you.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*



**GREENTREE NURSERY**  
*Growing the Extra Mile*

*Reed Says:*  
"Even a young farmer knows...  
Green Tree Nursery is the place  
to buy your nurserystock!  
Call my Grandma for more information."

Call Karlene Hanf: 209.401.0346  
[karlenehanf@greentreenursery.com](mailto:karlenehanf@greentreenursery.com)  
[GreentreeNursery.com](http://GreentreeNursery.com)

23979 Lake Road, La Grange, CA 95329 | Office: 209.874.9100 | Fax: 209.874.2381

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**<sup>®</sup> SG

HERBICIDE

**Matrix<sup>®</sup> SG herbicide** makes controlling weeds easy. It provides pre- and early post-emergent control of important weeds like fleabane, marestalk, 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.

 **CORTEVA**<sup>™</sup>  
agriscience

Agriculture Division of DowDuPont

Visit us at [corteva.com](http://corteva.com)

©<sup>™</sup>Trademark of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners. Always read and follow label directions. ©2018 Corteva Agriscience



A young Kerman pistachio tree on PGI rootstock; our experiment will be investigating, among other things, how to mitigate the effects of early salinity with better quality water. All photos Courtesy of Irvin Arroyo.

# LATEST RESEARCH on Salinity Management in Pistachios

By: Cecilia Parsons | Associate Editor

Planting pistachio trees in California's Central Valley with the long-term goal of productivity is best achieved when both soil and water quality are good.

That scenario is not always played out and trees are often planted where soil and water quality are marginal. Researchers, looking at the limitations soil and water place on pistachio tree productivity, have been focused on yields and how it is affected by marginal soil and water quality.

## Salinity Studies

The next generation of salinity lysimeter and field studies examining the effects of salinity on pistachio tree growth and productivity is underway at the United States Department of Agriculture (USDA)/Agricultural Research Service (ARS) in Parlier. The study involves two different rootstocks, PG-1 and UCB-1, and irrigation of two-year-old trees with saline water.

University of California (UC) researcher Louise Ferguson and USDA-ARS scientist Gary Banuelos, along with graduate student Irvin Arroyo are evaluating the accumulation of sodium at the cellular level and macro level along with other biochemical responses of the trees grown in individual lysimeters using saline for three years.

As these young trees, though budded, will not be producing a crop during this time, the focus will be on responses exhibited by the trees and the accumulation and location of sodium, which can be toxic once its concentration exceeds the tree's threshold storage levels. This research team will also be looking at what is taking place in the soil with the accumulation of sodium. Salinity flux, gaseous oxygen, soil temperature and soil moisture in the soil profile will be measured.

*Continued on Page 40*

The 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](http://petersontrapco.com)

**NON-GMO**

# BIOSTIMULANT FERTILIZERS, PEST CONTROL & BIO FUNGICIDE

**INCREASE FLOWERING  
& FRUIT PRODUCTION  
WHEN USING PURE  
PROTEIN DRY**

**99% OF NITROGEN DERIVED  
FROM FISH PROTEIN  
HYDROLYSATE, INCREASES  
WEIGHT OF  
FRUITS & VEGETABLES**

## **PURE PROTEIN DRY 15-1-1 PRIMO AMINOS**

**18 TYPES OF AMINO ACIDS  
CONTAINS 80% + AMINO ACIDS  
100% WATER SOLUBLE**

**7.5-1-25  
5-7-14  
11-8-8**

**ORGANIC TREE NUT  
NUTRITION FOR ALL  
STAGES OF GROWTH**

### **ALMOND FERTILIZER PROGRAM**

Apply as a Foliar Spray or Through Irrigation



**AT PETAL FALL – APPLY ONE POUND PER ACRE OF  
PPD – PURE PROTEIN DRY 15-1-1**



**WHEN DIME SIZE – SPRAY 2 POUNDS /ACRE PPD**



**SPRAY 3 WEEKS LATER – 2 LBS/ACRE CAN ADD EX-ICUTE  
FOR MITE CONTROL WITH THE PPD - IN ONE SPRAY**



**3 WEEKS BEFORE HARVEST 1 TO 2 LBS/ACRE PPD,  
CAN APPLY EX-ICUTE WITH PPD IF MITES PERSIST**



**AFTER HARVEST SPRAY 1LB/ACRE PPD FOR HELPING  
THE DEVELOPMENT OF NEXT YEARS FLOWER BUDS**

## **EX-ICUTE™ & RID-BUGS**

**25(b) OILS MINIMUM RISK  
ORGANIC INSECTICIDES**

**AND BIO-FUNGICIDE**

 APHIDS	 LEAF FOOTED BUG	 POWDERY MILDEW	 RUST ON LEAVES
 LYGUS BUG	 NAVEL ORANGE WORM	 BOTRYTIS	 HULL ROT
 MITES	 SCALES	 ALTERNARIA	 ANTHRACNOSE
 THRIPS	 WHITE FLIES		

## **Weed-a-Way**

**CONTACT AND  
PRE EMERGENT  
HERBICIDE**




WSDA LISTED



SALES CONTACT INFO:

**ED ZYBURA**  
(805) 550-7776  
edzybura@charter.net

**JOE HASLETT**  
(805) 748-4033  
joehaslett.oap@gmail.com



**www.OrganicAGProducts.com**  
Guaranteed by AZ ENTERPRISES INC DBA ORGANIC AG PRODUCTS  
2367 Brant Street • Arroyo Grande, CA 93420



Lysimeter trees UCB1 and PG1 rootstock before budding.



UCB1 and PG1 rootstock after budding.



Heraclio Reyes, pistachio nurseryman and producer pruning rootstock.

*Continued from page 38*

# 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



**Contact Us Today**

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

The study will show what happens to younger trees on PG-1 and UCB-1 rootstocks with saline irrigation during early growth. Blake Sanden, Kern County farm advisor emeritus and Ferguson have shown in earlier field trials in Kern County that UCB-1 is more salt tolerant than PG-1.

### Panoche Drainage District

The research study will also include a field evaluation of yield and quality and biochemical parameters in established PG-1 trees grown under long-term saline irrigation. Tree growth and yield recovery with good quality irrigation replacing saline irrigation will be measured. The trees, in different blocks located in the Panoche Drainage District near Firebaugh, have been grown under saline conditions since planting in 2002, 2009 and 2011. The research team will also evaluate the drainage water impacts on soil quality.

The Panoche districts are cooperating with the study, which is being led by Fresno State University (FSU) plant pathologist Gurreet Brar. Funding sources for the research is from California Department of Food and Agriculture (CDFA) and CSU-Agriculture Research Institute.

Banelos, noting the recurring drought cycles in California, and the growing pistachio acreage, said that alternative sources of water need to be identified if crops like pistachios are planted. Besides groundwater, which may also have high salinity, there is drainage water from irrigation or surface runoff, which also may contain salt along with boron and

selenium. The two sources of water available in the location of this research project are poor quality groundwater or subsurface drainage water, both are high in salinity, boron and selenium. Use of this quality of water requires not only planting crops that are tolerant, but also having proven soil management practices to overcome the effects of salinity on tree health and yields.

Banuelos said that until this study, there have been few field studies evaluating this scenario, with most looking at crop yields. Looking at the very young trees, they will be looking at tree responses to salinity for three years.

The same biochemical responses in established PG-1 trees will be evaluated at the orchards in the Panoche Water District and Panoche Drainage District.

Panoche Water District serves about 38,000 acres and Panoche Drainage District serves approximately 44,000 acres, overlapping Panoche Water District and other nearby lands in and around Firebaugh. Typical crops include almonds, tomatoes, cotton, wheat, asparagus, pistachios and alfalfa.

Aaron Barcellos with A-Bar Ag Enterprises is one of the pistachio growers in the Panoche Water District and Panoche Drainage District who is hoping this research will provide information on how they can use the drainage water from irrigated fields and orchards. Barcellos said pistachio acreage in the districts has expanded in the past 7-8 years and knowing the limits of salt tolerance and impacts on yield will be helpful.

### Higher Salt Tolerance

With the higher salt tolerance of pistachio trees, growers are hoping this research can assist them in with their water management and use of subsurface drainage water.

Growers know that pistachio trees are more salt tolerant than other permanent crops, but don't fully understand the salt load the trees can handle and remain productive, Barcellos said.

### Earlier Salinity Studies

Earlier salinity studies by Ferguson and Sanden have found that while plant roots do most of the work in protecting the plant from excessive uptake of salts, and filter out most of the salt in the soil while taking up water, the processes governing the relationship between water and ion flow are complex. Sodium and chlorine and other ions do not move passively with the transpiration stream and neither are their movements entirely independent of it.

Ferguson said that salt sensitivity is related to mechanisms within the plant tissue which minimize the effects of toxic ions.

A plant can only grow or survive in a saline soil if it can both continue to take up water and exclude a large portion of the salt in the soil solution. Research based on the study of plant water use efficiency shows that the plant retains only two percent of the water transpired. In order to prevent the salt

concentration in the plant from increasing above that in the soil, then only two percent of the salt should be allowed into the shoot.

Salts in the soil water may inhibit plant growth for two reasons: first, salts reduce the ability of the plant to take

*Continued on Page 42*



Panoche field plot 2011 trees in May.

*More than a Century  
of Service to the  
Nut Industry*



AWARDED FOR  
AGRIBUSINESS  
Top Specialist Brokerages 2017  
Insurance Business America

**Buckman-Mitchell, Inc.**  
Financial & Insurance Services  
500 North Santa Fe, • Visalia, CA 93292 • (559) 733-1181  
License #0011334, #0A96361 www.bminc.com

f t in



Aerial overview of Panoche Pistachio Plots.



Panoche field leaf and nut cluster in September.

*Continued from page 41*

up water. The effect is the same as drought stress. Second, salts that enter the plant in the transpiration stream ultimately injure cells in the transpiring leaves. This is the ion-specific effect of salinity.

The earlier studies found that pistachio trees may tolerate a soil salinity similar to cotton of up to 9.4 dS/m without yield loss. This has not been proven on a commercial scale from planting to maturity.

University of California Salinity Management web site explains the measurement.

Soil and water salinity is often measured by electrical conductivity (EC). The most commonly used EC units are deciSiemens per metre (dS/m) and millimho per centimetre (mmho/cm), numerically:

$$1 \text{ dS/m} = 1 \text{ mmho/cm}$$

Simple relationships are used to convert EC to TDS (Total Dissolved Solids), or vice versa:

$$\text{TDS (mg/L or ppm)} = \text{EC (dS/m)} \times 640 \text{ (EC from 0.1 to 5 dS/m)}$$

$$\text{TDS (mg/L or ppm)} = \text{EC (dS/m)} \times 800 \text{ (EC > 5 dS/m)}$$

The ratio of TDS to EC of various salt solutions ranges from 550 to 700 ppm per dS/m, depending on the compositions of the solutes in the water. For soil extracts in the EC range from 3 to 30 dS/m, TDS can be estimated using the formula:  $\text{TSS (mmol/L)} = \text{EC (dS/m)} \times 10$ .

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

# 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](http://www.satake-usa.com) | (209) 551-3203







---

# IF PLANTS WERE ROCKETS, THEN YES, THIS WOULD BE ROCKET SCIENCE.

---

Protassium+<sup>®</sup> sulfate of potash (0-0-50-17S) is the leading source of potassium for specialty plant nutrition. With less than 1% chloride and the lowest salt index per unit of  $K_2O$ , the result is quality crops and higher yields.

Benefits of Protassium+ include:

- Quality organic grades, OMRI certified
- Only U.S. producer
- Ready for shipment via truck or rail to a location near you

Visit [ProtassiumPlus.com](http://ProtassiumPlus.com)





Photo courtesy of Kathy Coatney.

# American Pecan Council Asks Consumers to #PLEDGEPECANS

By: Alex Ott | Executive Director, American Pecan Council

The fall brings both harvest and the holiday season, a busy time for the pecan industry: growers are in the midst of harvesting the 2018 crop, and processors and retailers are doubling down to meet the seasonal demand. Meanwhile, the American Pecan Council (APC) is hard at work rolling out the next phase in its industry-wide consumer marketing campaign. We are in the midst of a major push this holiday season but before I share those details, let's first take a look back at how far we've come.

It has been just over a year since we began spreading the word about the nutrition, versatility and heritage of pecans, and just six months since launching American Pecans, the Original Supernut™ to American consumers. While there is still much we need to accomplish, I am encouraged by the many successes and learnings our team has seen in the first full year of marketing American's native nut.

## Smart Marketing Backed By Research

If you've attended APC marketing update sessions at recent industry conferences or have read our previous columns in this publication, you know that consumer research is the cornerstone of our marketing strategy. To ensure we are using marketing dollars most effectively, we and our agency partner, Weber Shandwick, rely upon research to inform how we define our consumer audience and how we can best reach them. Well before we officially kicked off our marketing efforts in July 2017, we invested in research to understand consumer perceptions of pecans.

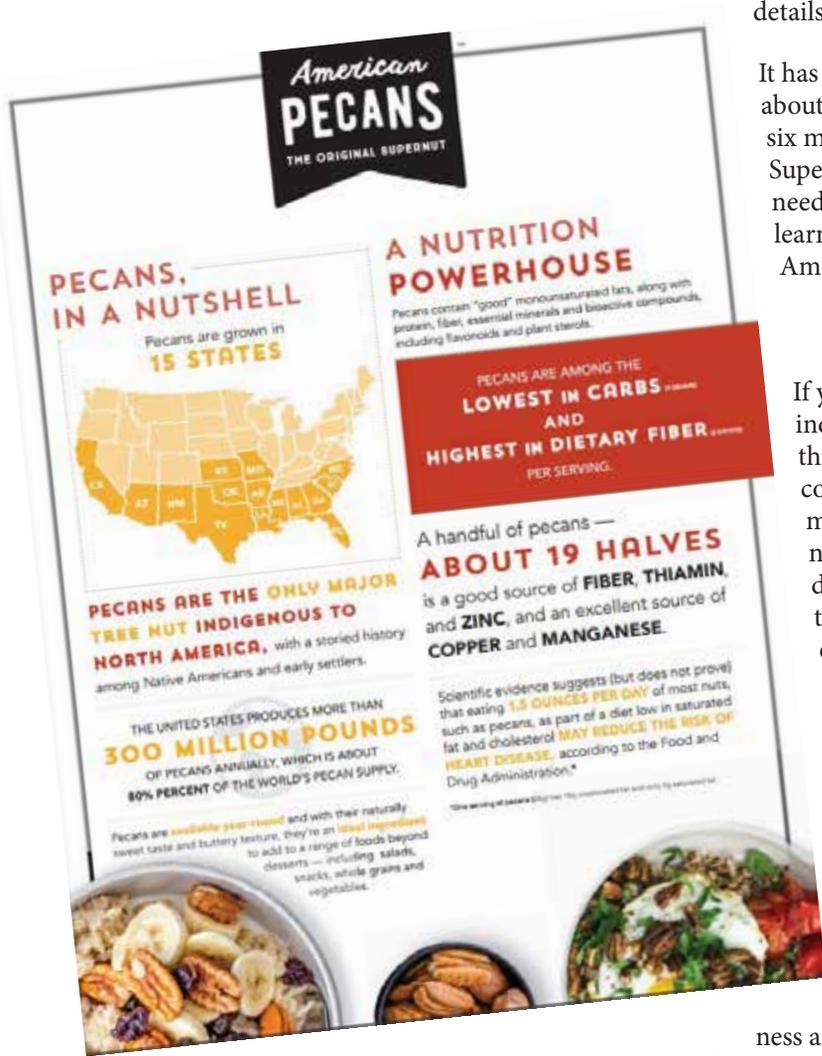
The results were surprising—when asked to name different nuts, pecans did not even make the list for many consumers. In fact, pecans were most often associated with baking and holiday pies, compared to other tree nuts, which were linked to snacking and a broader range of culinary uses.

This lack of recall and awareness of pecans set the baseline for our marketing strategy. In order to grow demand and drive consumption, we needed to first build aware-

ness and educate consumers about the nutrition, versatility and heritage of pecans.

## Sharing the Original Supernut Story Far and Wide

Last summer, we set ourselves to that task, and focused our efforts on reaching



The APC develops resources the industry can use to talk about the power of pecans. Photo courtesy of American Pecan Council.

*Continued on Page 46*

Helping Farmers Grow NATURALLY since 1974

# COMPOST

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



**NEW ERA FARM SERVICE**

[www.newerafarmservice.com](http://www.newerafarmservice.com)

Doug Graham, Certified Crop Advisor, License #329563

Cell: 559-903-6007 Phone: 559-686-3833 Fax: 559-686-1453

2904 E. Oakdale Ave. | Tulare, CA 93274

[doug@newerafarmservice.com](mailto:doug@newerafarmservice.com)



Continued from page 44

health-conscious consumers who enjoy incorporating new ingredients into their home cooking. When it came to marketing to this group, we again turned to research to ensure our message reached and resonated with our target audience.

Third party research and consumer research conducted on behalf of the APC told us that certain methods—specifically social media, news sources, and influential food and nutrition blogs—are more effective uses of resources than traditional advertising tactics, like billboards and TV ads, when it comes to gaining the attention of our consumer audience.

With this in mind, we have used marketing tactics to meet consumers in the places they most often seek food inspiration and information—from national magazines to daily newspapers, broadcast TV to radio, food blogs to social media. The results surpassed our expectations. In the first year of our

marketing efforts, pecans were included in upwards of 4,000 news pieces and TV segments—more than five times the amount the previous year.

### Partnering with Trusted Sources

We also sought to influence consumers through voices they trust. Ninety percent of foodies turn to websites and social media to get food information, and online channels played heavily in our marketing strategy. By harnessing the power of influential nutrition experts and food bloggers, we were able to reach a combined audience of 24 million people, all the while meeting consumers where they are already spending time—online.

These same influencers are also a major source of content for APC online and social media channels. Many of our food blogger partners develop original recipes for our use in marketing efforts. Since we launched our influencer program last year, our partners have developed more than a hundred new

recipes to showcase the versatility and many uses of pecans outside holiday pies.

We encourage the industry to look at APC assets as their own. In addition to appearing on AmericanPecan.com and on APC social channels, these recipes can be leveraged by industry in your own marketing and promotion efforts. You can post them directly to your own social channels by selecting the “Share” button located on each recipe page, or reach out to the APC at [industry@americanpecan.com](mailto:industry@americanpecan.com) if you'd like to include the recipes

and imagery on your business' website.

### Putting the FMO to Work for Industry

We are committed to supporting each grower and handler as they promote America's native nut. In addition to our partner content, we've created a host of resources you can use as we all work to raise awareness, grow preference, and drive demand for pecans.

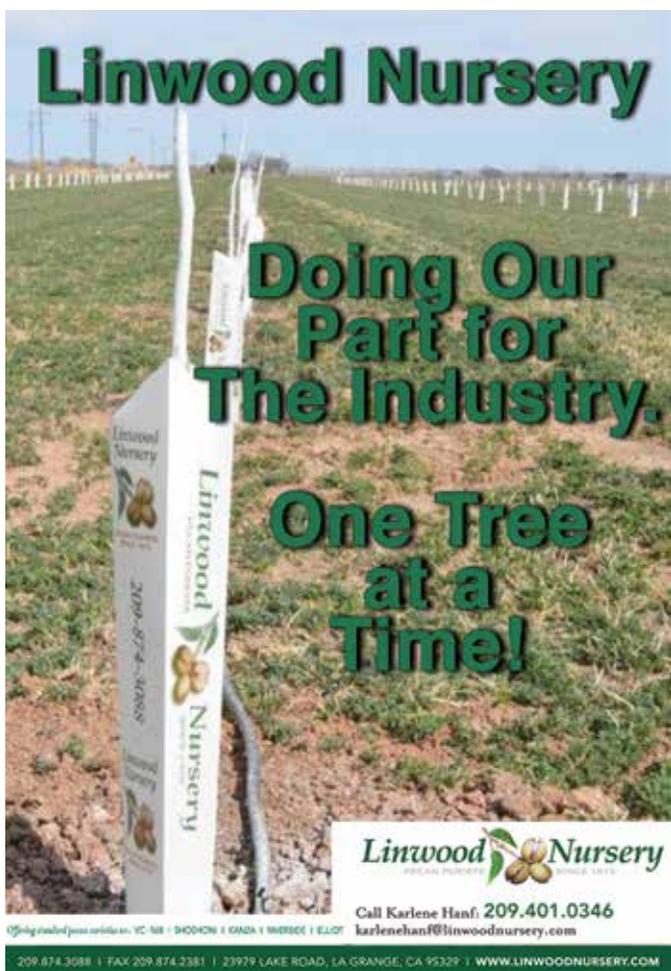
Our hope is that you leverage every available benefit made possible by the APC. That's why we've created an online digital toolkit full of helpful tools and materials you can reference when talking about the nutrition, versatility and heritage of pecans. From printable fact sheets to nutrition guides, the toolkit is a one-stop source of American Pecans branded materials to educate your customers, neighbors, and future pecan lovers everywhere. Check out [AmericanPecan.com/toolkit](http://AmericanPecan.com/toolkit) (password: pecans18) to access these resources.

In addition to the online content, we have our most popular printed materials available by request. We're offering to each member of industry 50 free nutrition handouts and 50 free The Original Supernut fact sheets—just email us at [industry@americanpecan.com](mailto:industry@americanpecan.com) or call the office at 817-916-0020 to put in your request.

### Better Measurement for Better Results

Digital marketing tools have allowed us to track the results of our efforts more accurately than ever possible before. By constantly reviewing and evaluating our campaign, we can adjust our tactics to ensure our marketing strategy is as effective as possible.

We know that the assessments through the FMO represent a big investment, and we must be good stewards of the funds provided by industry. I am pleased to share that in our first full year of marketing efforts, our average spend has been \$7.21 for every 1,000 consumers reached—the low end of the industry average (\$7.10-\$8.10). Moving into 2019, we remain steadfast in our pledge



to spend industry's dollars efficiently and effectively.

### Our Year Two Focus

So, what does the path ahead for American Pecans look like? Building on our progress to date, we will use many of the same tactics that have already proven successful, but with an even more targeted approach.

The APC cast an intentionally wide net in the first year; we consider most Americans a potential consumer and we needed to raise general awareness. While we will continue to reach a broad audience, much of our marketing efforts in year two will have a laser-focus on meal-planning Gen X and Gen Y moms with kids at home. Our research has shown that these consumers have significant household purchasing power, and represent the greatest potential for driving demand for pecans as they actively look for new, wholesome ways to feed their families.

This target audience is also highly engaged on the very channels where we are already sharing the American Pecans message. Many of these moms are active on social media and are heavy consumers of online content. They value the endorsements of well-known subject matter experts and online personalities, including food and nutrition bloggers. In the year ahead, the APC will continue to reach this group through partnerships with online influencers, as well as further leveraging our social media tactics.

### Super American Pecan-A-Thon Promotes Harvest Bounty

To jumpstart this new phase of marketing, we will promote American Pecans this holiday season via an interactive, online variety show. Just ahead of the Thanksgiving holiday, when pecan awareness is at its peak and extra pecans are in grocery aisles and kitchen cupboards, the Super American Pecan-A-Thon will be a fun and engaging way to promote pecans beyond the pie as a delicious, nutritious and versatile cooking and snacking staple for not only the holidays but long after celebrations end.

The show will be hosted in partnership with Condé Nast top recipe site, Epicurious, and reach our target audience through other Condé Nast-owned media properties, such as Bon Appetit, Self and Condé Nast Traveler. Hosted by a nationally recognized celebrity, the show will include a variety of live cooking demonstrations, holiday recipes and cooking tips, as well as festive home décor and entertaining ideas.

The big event will also showcase American pecan growers, the people who make the pecan industry possible, alongside food and entertaining influencers. We know a large portion of our target audience cares about buying local and learning about the people behind their food, so the Super American Pecan-A-Thon is a perfect opportunity to put industry at the forefront of the American Pecan story. In a season that celebrates family, tradition and community, the personal stories and powerful legacy of the American Pecan industry will shine through during the broadcast.

### Motivating Consumers to #PledgePecans

The great news is that the Super American Pecan-A-Thon is more than a one-time broadcast – consumers will interact during and after the show by accessing special recipe and holiday content by committing to make one more pecan dish beyond pie in support of American pecan growers.

To build community and continue the momentum of pecan-inspired cooking, snacking and idea-sharing, the hashtag #PledgePecans will be used across social media channels, and our influential food and nutrition partners will encourage their loyal audiences to take the pledge.

Sign up for the APC newsletter and check out our website AmericanPecan.com for updates on the Super American Pecan-A-Thon and how you can participate and spread the word to family and

*Continued on Page 48*

**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](http://www.insort-inc.com) **insort**  
intelligent selection



Partner recipes, like Registered Dietician Holly Grainger's Chocolate Chip Pecan Breakfast Cookies, showcase the versatility and nutrition of pecans. Photo courtesy of Holley Grainger, RD, on behalf of the American Pecan Council.

*Continued from page 47*

friends. And once you #PledgePecans yourself, let us know what new dishes you're making with The Original Supernut this holiday season.

### Supporting and Connecting with You

We'll also focus on continuing to provide you with more resources—both for your own marketing efforts and in support of our collective work to promote the power of pecans. With each new phase of our marketing campaign will come new tools for you to use, all of which will be available on the digital toolkit at AmericanPecan.com.

In the year ahead, I commit to keeping the industry updated. If you have not already, please sign up to receive our semi-monthly newsletter by visiting the AmericanPecan.com website. Of course, communication is a two way street, and we ask that you continue to share feedback and reach out to the APC with questions or comments. This effort would not be possible without the industry's support, and we are grateful for the opportunity to hear from you directly.

To each of you, I wish you a happy holiday season, on behalf of the entire APC staff and myself. Here's to further success during this season and in the New Year!

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*



### 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
- Quiet, 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](http://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., its subsidiaries or affiliates. First Call is a registered trademark of First Call Inc.

They may  
be unseen,  
but they  
shouldn't go  
unnoticed.



**VELUM**<sup>®</sup>  
ONE



Nematodes are the invisible threat to almond orchards.  
Protect your crops from nematode damage with Velum<sup>®</sup> One.

- Protection from wide-spectrum nematode damage.
- Can increase yield 8.3% with an average of \$475/bearing acre.<sup>1</sup>
- 58% average increase in canopy diameter in newly-planted trees.<sup>2</sup>
- Convenient in-season application via chemigation.

For more information, visit [www.VelumOne.com](http://www.VelumOne.com).

<sup>1</sup> Profit increase based on 2017 almond price/lb. and average yield/bearing acres with 8.3% increase in yield versus untreated over three-year trial, per trial data of five locations with a single application of Velum One at 6.5 or 6.85 fl. oz./A.

<sup>2</sup> Velum One applied at 6.5 oz./A, spring 2017, via drip irrigation. Trees planted in January 2017. Increase in green canopy pixels based on an average of two rows of untreated trees compared to an average of two rows of Velum One-treated trees.

# Choosing the Right Hazelnut Variety

## FOR YOUR OPERATION

By: Cecilia Parsons | Associate Editor

Ask Oregon Hazelnut Commission chairman Gary Rodakowski what hazelnut variety to plant and he'll quickly tell you: "anything resistant to Eastern Filbert Blight."

Rodakowski has seen first hand the effects of this disease on his 85-year old Barcelona variety hazelnut trees.

"This disease can't be stopped in these older varieties. With the newer resistant varieties, we can stay in production," Rodakowski said.

### Eastern Filbert Blight

Eastern Filbert Blight causes severe cankering, branch dieback and eventual death of susceptible hazelnut varieties. The disease was carried to Washing-

ton and Oregon hazelnut orchards by infected plant material brought from eastern states.

Beginning in the 1960s, the hazelnut industry in Oregon was losing production due to this fungal disease and planting slowed, as growers did not want to invest in orchards that would eventually succumb to the disease. Planting and production began to grow again, Rodakowski said, when Oregon State University (OSU) researchers developed new varieties that were highly resistant to the disease. New hazelnut orchard plantings have been on the increase since then.

### Hazelnut Varieties

According to the OSU hazelnut breeding program the varieties 'Lewis,' 'Clark,'

'Gem,' and 'Sacajawea,' have quantitative resistance to EFB. The varieties 'Santiam,' 'Yamhill,' 'Dorris,' 'Wepster' and 'McDonald' have a single dominant resistance gene.

Outside of EFB resistance, there are several other factors growers should keep in mind with deciding on a hazelnut variety to plant. It must be productive in the growing conditions at the orchard site. Compatible pollinizers must be planted in the orchard, have suitable harvest timing and the variety needs to match grower expectations for yields and nut qualities.

OSU has rated hazelnut varieties with and without EFB resistance on characteristics including vigor, growth habit, cumulative yield, yield efficiency, harvest date and susceptibility to filbert bud mite.

Nut and kernel characteristics were also evaluated. They included nut weight, kernel percentage of weight, nut shape, grade size, blanching, good nut percentage and kernel fiber.

### Newer Varieties

No single variety has a perfect score for all desirable characteristics. Newer varieties Dorris and Jefferson score lower on vigor, but high in yield efficiency. Sacajawea and Lewis have high scores for good nut percentage, but have small grade size. Wepster scores highest in vigor and cumulative yield.

Other examples of newer varieties are Yamhill, a kernel variety that has a shell out rate of 46 percent and an earlier harvest date than the standard Barcelona harvest timing. Willamette Hazelnut Growers reports yields at 4,400 pounds per acre.

Jefferson is an in shell variety and is

*Continued on Page 52*



**WALNUTS, HAZELNUTS, PECANS DRYERS STILL AVAILABLE FOR 2018**

**BIN FEATURES**

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

# THE BEST... JUST GOT BETTER

ALL NEW **ORCHARD**CAB. DESIGN  
FOR JOHN DEERE!



- More insulation keeps cab quieter and cooler
- Controls relocated for ease of operation
- Smoother frame and "Crop-friendly" shape
- Better visibility all around
- Certified ROPS with two entry/exit Doors
- 1/2" tempered Hehr glass available



**ASK FOR NELSON** *ORCHARD* **CAB.**

NELSON MFG. CO., INC. YUBA CITY, CA • (530) 673-0919  
INFO@NELSONHARDIE.COM | WWW.NELSONHARDIE.COM



Continued from page 50

avored as a highly resistant EFB variety. Wepster was developed for the chocolate and baking industry with kernel size a consideration. McDonald was aimed at the kernel market, filling nearly 51 percent of the shell and maturing two weeks earlier than Barcelona.

### Variety Alleles

Variety alleles are another consideration. A form of a gene, allele numbers signify compatibility with another hazelnut variety. Since hazelnuts are self-incompatible, a tree cannot set nuts with its own pollen. Pollen of some varieties will not set nuts on certain other varieties. OSU recommends planting three compatible pollinizer varieties, early, mid and late, in an orchard to cover the extended female flowering time. Standard percentage of pollinizer varieties in an orchard is 10-20.

Rodakowski said if he were planting a new orchard, he would choose more pollinizer varieties and plant up to 20 percent for better production.

### Other Factors to Consider

Value of the crop also plays a part in choosing a variety of hazelnut to plant. Hayden Craig, grower services representative at Willamette Hazelnut Growers explained that growers can choose kernel varieties that are valued for taste,

shell out and blanch ability or they can choose in shell varieties that are suited for ingredient uses. Some growers will go the all kernel route for an early harvest, others Craig said, will diversify and plant a combination of kernel and in shell varieties.

Soil is a big consideration in variety selection, Rodakowski said.

Deep river bottom soils are ideal, but hazelnuts are also being planted in areas with more marginal soils. Those trees could have some challenges, and there is not a lot of production history on the newer hazelnut varieties.

“As a grower, you have to look at your location,” Craig said in making variety decisions. If you are concerned with drainage, or how your soil holds water, then the earlier harvesting varieties would be a better choice, he said. Muddy conditions at the second pick can be avoided by planting a variety that can be harvested earlier.

Aside from harvest considerations, there is the fact that hazelnut trees do not grow well in poorly drained soils where their roots are in saturated soils for long periods.

“If you want your trees to grow quick and big and be healthy, plant them in good soils,” Craig advised.

### Early Harvest

Early varieties like Yamhill or McDonald can be harvested early and the second pick can come before muddy conditions are expected.

Since hazelnut acres have expanded in Oregon beyond traditional growing areas, growers are planting orchards in less than ideal conditions. In those cases, an early variety that has higher market value should be considered, Craig said. Yamhill, Sacajawea or McDonalds are higher end varieties that can make up for production losses and in the early stages would provide a quicker return on investment.

Harvest timing can be a critical factor. Rodakowski said some of the newer varieties could be 95 percent harvested by September 26. In wetter areas, that would be an advantage. Later varieties can be affected by weather.

“The sooner they are on the ground and can be picked up the better,” Rodakowski said.

### Irrigation

Response to irrigation is uniform in hazelnut varieties. The standard years ago was to irrigate only for the first three years after planting. Now, Craig said, irrigation is done for as long as a grower wants as they have found older trees benefit from the water as long as they are in well-drained soils.

Orchard spacing does not seem to make a difference in variety selection. With high-density plantings, all varieties can be used.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

**HILBERS**  
INCORPORATED  
CONTRACTORS & ENGINEERS

**STEEL BUILDINGS**

AGRICULTURE

PUBLIC WORKS

INDUSTRIAL

PROUDLY FEATURING  
**BUTLER**  
BUILDINGS

As a dedicated partner in the agricultural community, Hilbers is committed to not only meeting your expectations, but protecting your investments. Hilbers Inc. has assisted many farmers, processors and packers by providing pre-engineered buildings as cost-effective solutions for machine and equipment storage, cold storage, commodity bulk storage, food processing, and fumigation.

Whether it's a design-build project or renovating or expanding an existing building, Hilbers has the expertise to see you through to the completion of your project and help your industry grow.

**hilbersinc.com**  
1216 Stabler Ln.  
Yuba City, Ca. 95998  
530-873-2947

# Keep the beauty of almond bloom longer.



## Extend bloom. Boost nut set.

Extend your almond bloom with ReTain® Plant Growth Regulator for California. By reducing ethylene production, *ReTain* extends flower viability and increases nut set. Contact your PCA or visit [valent.com/ReTainCA](http://valent.com/ReTainCA) for more information.

**ReTain**®  
PLANT GROWTH REGULATOR  
FOR CALIFORNIA



Products That Work, From People Who Care® | [valent.com](http://valent.com) | 800-6-VALENT (682-5368)

**Always read and follow label instructions.**

Products That Work, From People Who Care is a registered trademark of Valent U.S.A. LLC. *ReTain* is a registered trademark of Valent BioSciences Corporation. ©2017 Valent U.S.A. LLC. All rights reserved. Printed in the U.S.A. AM57991

# Forklift Safety 101



By: Amy Wolfe, MPPA, CFRE |  
President and CEO, AgSafe

The food and farming industry still rank amongst the top ten most hazardous industries in which to work. While some hazards are just inherent in the work we do, it is imperative that we take steps towards prevention. In reviewing the top OSHA (Occupational Safety and Health Administration) agricultural violations in California from October 2016 through September 2017, we discover that operation of agricultural equipment, tractors and forklifts, in particular, fall in the top five violations, resulting in nearly \$200,000 in penalties.

More significant than the penalties are the number of agricultural workers who suffer from a serious lost-work-time injury. According to United States Department of Labor, OSHA, that number is a shocking 243 workers each day. This begs the question, how to we begin preventing those injuries that are a result of forklift operation?

## Forklift Training

First, we need to train. According to the California Code of Regulation (CCR), Title 8, Section 3441, an employee shall be instructed in the safe operation and servicing of all equipment before the employee is assigned to operate the equipment. Training shall continue annually thereafter. Additionally, imbedded in the general industry standard, CCR, Title 8, Section 3650, are safety rules for forklifts that serve as essential training topics:

1. Only drivers authorized by the employer and trained in the safe operations of industrial trucks or industrial tow tractors pursuant to Section 3668 shall be permitted to operate such vehicles.
2. Stunt driving and horseplay are prohibited.
3. No riders shall be permitted on vehicles unless provided with adequate riding facilities.
4. Employees shall not ride on the forks of lift trucks.
5. Employees shall not place any part of their bodies outside the running lines of an industrial truck or between mast uprights or other parts of the truck where shear or crushing hazards exist.
6. Employees shall not be allowed to stand, pass, or work under the elevated portion of any industrial truck, loaded or empty, unless it is effectively blocked to prevent it from falling.
7. Drivers shall check the vehicle at the beginning of each shift, and if it is found to be unsafe, the matter shall be reported immediately to a foreman or mechanic, and the vehicle shall not be put in service again until it has been made safe. Attention shall be given to the proper functioning of tires, horn, lights, battery, controller, brakes, steering mechanism, cooling system, and the lift system for forklifts (forks, chains, cable, and limit switches).
8. No truck shall be operated with a leak in the fuel system.
9. Vehicles shall not exceed the authorized or safe speed, always maintaining a safe distance from other vehicles, keeping the truck under positive control at all times and all established traffic regulations shall be observed. For trucks traveling in the same direction, a safe distance may be considered to be approximately 3 truck lengths or preferably a time lapse—3 seconds—passing the same point.
10. Trucks traveling in the same direction shall not be passed at intersections, blind spots, or dangerous locations.
11. The driver shall slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
12. Operators shall look in the direction of travel and shall not move a vehicle until certain that all persons

are in the clear.

13. Trucks shall not be driven up to anyone standing in front of a bench or other fixed object of such size that the person could be caught between the truck and object.
14. Grades shall be ascended or descended slowly.
  - When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.
  - On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.
  - Motorized hand and hand/rider trucks shall be operated on all grades with the load engaging means downgrade.
15. The forks shall always be carried as low as possible, consistent with safe operations.
16. When leaving a vehicle unattended (the operator is over 25 feet (7.6 meters) from or out of sight of the industrial truck), the brakes are set, the mast is brought to the vertical position, and forks are left in the down position, either:
  - The power shall be shut off and, when left on an incline, the wheels shall be blocked; or
  - The power may remain on provided the wheels are blocked, front and rear.
17. When the operator of an industrial truck is dismounted and within 25 feet (7.6 meters) of the truck which remains in the operator's view, the load engaging means shall be fully lowered, controls placed in neutral, and the brakes set to prevent movement.
  - Exception: Forks on fork-equipped industrial trucks may be in the raised position for loading and

unloading if the forks are raised no more than 42 inches above the level where the operator/loaders are standing, and the power is shut off, controls placed in neutral and the brakes set. If on an incline, the wheels shall be blocked.

18. Vehicles shall not be run onto any elevator unless the driver is specifically authorized to do so. Before entering an elevator, the driver shall determine that the capacity of the

elevator will not be exceeded. Once on an elevator, the industrial truck's power shall be shut off and the brakes set.

19. Motorized hand trucks shall enter elevators or other confined areas with the load end forward.
20. Vehicles shall not be operated on floors, sidewalk doors, or platforms

*Continued on Page 56*

*Biological Controls for  
Anthracnose, Alternaria, N.O.W.,  
and more...*

**BIO WITH BITE.®**

**REGALIA®**  
BIOFUNGICIDE

**VENERATE®**  
BIOINSECTICIDE

**GRANDEVO®**  
BIOINSECTICIDE

*Mid Valley Nut Conf.  
Visit us in Booth #25*

**Marrone®**  
Bio Innovations

marronebio.com

Continued from page 55

that will not safely support the loaded vehicle.

21. Prior to driving onto trucks, trailers and railroad cars, their flooring shall be checked for breaks and other structural weaknesses.
22. Vehicles shall not be driven in and out of highway trucks and trailers at loading docks until such trucks or trailers are securely blocked or restrained and the brakes set.
23. To prevent railroad cars from moving during loading or unloading operations, the car brakes shall be set, wheel chocks or other recognized positive stops used, and blue flags or lights displayed in accordance with Section 3333 of these Orders and Title 49, CFR, Section 218.27 which is hereby incorporated by reference.

24. The width of one tire on the powered industrial truck shall be the minimum distance maintained from the edge by the truck while it is on any elevated dock, platform, freight car or truck.
25. Railroad tracks shall be crossed diagonally, wherever possible. Parking closer than 8 1/2 feet from the centerline of railroad tracks is prohibited.
26. Trucks shall not be loaded in excess of their rated capacity.
27. A loaded vehicle shall not be moved until the load is safe and secure.
28. Extreme care shall be taken when tilting loads. Tilting forward with the load engaging means elevated shall be prohibited except when picking up a load. Elevated loads shall not be tilted forward except

31. When powered industrial trucks are used to open and close doors, the following provisions shall be complied with:
  - A device specifically designed for opening or closing doors shall be attached to the truck.
  - The force applied by the device to the door shall be applied parallel to the direction of travel of the door.
  - The entire door opening operation shall be in full view of the operator.
  - The truck operator and other employees shall be clear of the area where the door might fall while being opened.
32. If loads are lifted by two or more trucks working in unison, the total weight of the load shall not exceed the combined rated lifting capacity of all trucks involved.
33. When provided by the industrial truck manufacturer, an operator restraint system such as a seat belt shall be used.

When the load is being deposited onto a storage rack or equivalent. When stacking or tiering, backward tilt shall be limited to that necessary to stabilize the load.

29. The load engaging device shall be placed in such a manner that the load will be securely held or supported.

30. Special precautions shall be taken in the securing and handling of loads by trucks equipped with attachments, and during the operation of these trucks after the loads have been removed.

These rules are available in both English and Spanish:  
[https://www.dir.ca.gov/dosh/dosh\\_publications/IndTrucks\\_Eng.pdf](https://www.dir.ca.gov/dosh/dosh_publications/IndTrucks_Eng.pdf)  
[https://www.dir.ca.gov/dosh/dosh\\_publications/IndTrucks\\_Spa.pdf](https://www.dir.ca.gov/dosh/dosh_publications/IndTrucks_Spa.pdf)

### Pre-use Inspection

In addition to training, we need to do a daily pre-use inspection prior to operation of the forklift. Completing a pre-inspection can help prevent accidents and is a key requirement in the use of a forklift. If at any point during the inspection, something is not in proper working condition, it must be reported to the supervisor and/or mechanic and the vehicle taken out of operation.

First conduct a visual inspection, walk around the forklift looking at the forks, wheels, evidence of leaks and the seatbelt. After starting the engine, listen for any unusual sounds, check that all instruments are operational, test

Pre - Use Inspection Check List - Gas, LPG, or Diesel Forklift				
Equipment daily checklist - perform before use and/or at the start of every shift				
Note general vehicle condition. Clear away all collected debris, steam clean if necessary. Check for mechanical damage and loose or leaking components. Report faults to your supervisor or the maintenance department, whichever your company requires.				
Before starting engine, check the following:				
VISUAL INSPECTION	STATUS			REMARKS
	OK	NO	ADD	
Walk-around inspection (swearing details, capacity plate, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Forkslacking pin, carriage, mast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Wheels, tires & lug nuts (condition / pressure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Engine (check oil level and for leaks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transmission (check oil level and for leaks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Engine belts (check for adjustment / wear)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Air Cleaner (check indicator, clean or change as required)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Radiator (check coolant level and for leaks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Hydraulic tank (check oil level and for leaks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fuel tank (secure, valve open & fuel level)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Overhead guard (no damage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seatbelt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
After starting engine, check the following:				
START-UP ITEMS	STATUS			REMARKS
	OK	NO	ADD	
Engine (does it sound normal?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Instruments (check for normal readings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Exhaust system (check for leaks & excessive smoke)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Wipers & lights (spotlights, turn signals, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Horn & backup alarm (strobe lights)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All hydraulic controls (normal operation - lift, tilt, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transmission & clutch (direction and speed range)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Brakes (parking & service brakes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Steering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Note anything abnormal or in need of repair: _____				
Operator: _____ Supervisor: _____				
Vehicle #: _____ Hour Meter Reading: _____ Date: _____				

Training shall continue annually thereafter. Additionally, imbedded in the general industry standard CCR, Title 8, Section 3650, are safety rules for forklifts that serve as essential training topics. All photos courtesy of AgSafe.

lights, horn and wipers, test brakes and steering. Make note of anything abnormal and communicate your findings to a supervisor or the mechanic. Use a checklist to assist in documenting the pre-use inspection.

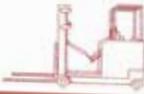
This is merely a brief overview of CalOSHHA regulations that effect forklift use in the food and farming industries. If you have questions about the specifics, including sample policies, visit [www.agsafe.org](http://www.agsafe.org), call (209) 526-4400 or send an email to [safeinfo@agsafe.org](mailto:safeinfo@agsafe.org).

AgSafe is a 501c3 nonprofit providing training, education, outreach and tools in the areas of worker safety, human resources, food safety, and pesticide safety for the food and farming industries. Since 1991, AgSafe has educated nearly 75,000 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](mailto:article@jcsmarketinginc.com)*



## OPERATING RULES FOR INDUSTRIAL TRUCKS



**General Industry Safety Order 3664  
Operating Rules (Part (a))**

(a) Every employer using industrial trucks or industrial low tractors shall post and enforce a set of operating rules including the appropriate rules listed in Section 3650 (f).

**General Industry Safety Order 3650  
Industrial Trucks. General (Part (t))**

(10) Trucks traveling in the same direction shall not be passed at intersections, blind spots, or dangerous locations.

(11) The driver shall slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.

(12) Operators shall look in the direction of travel and shall not move a vehicle until certain that all persons are in the clear.

(13) Trucks shall not be driven up to anyone standing in front of a bench or other fixed object of such size that the person could be caught between the truck and object.

(14) Grades shall be ascended or descended slowly.

(A) When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.

(B) On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

(C) Motorized hand and handrider trucks shall be operated on all grades with the load-engaging means downgrade.

(15) The forks shall always be carried as low as possible, consistent with safe operations.

(16) When leaving a vehicle unattended (the operator is over 25 feet (7.6 meters) from or out of sight of the industrial truck), the brakes are set, the mast is brought to the vertical position, and forks are left in the down position, either

(A) The power shall be shut off and, when left

We need to do a pre-use inspection prior to operation of a forklift to ensure it is in proper working order and safe for operation.



# EFFECTIVE NEMATODE CONTROL



## THAT'S ALSO ORGANIC

**ORGANIC Fungicide & Nematicide!**



**2 IN 1**

KILL: NEMATODES & SOIL-BORNE DISEASES

**\$**

SAVE: LOWER COST PER APPLICATION

**Globe icon**

ORGANIC: COMPLETELY SAFE & NON-TOXIC

**Person icon**

ZERO REI: SPRAY & WALK SAME DAY

**Target icon**

VERSATILE: APPLY WHEN, WHERE & HOW YOU WANT

**Plant icon**

SAFE: USE ON ALL TREES, ROW CROPS, VINES

Visit: [HUMAGRO.COM/WCN1118](http://HUMAGRO.COM/WCN1118)

PRODUCT OF **HUMAGRO**

# THE PRODUCE SAFETY RULE: *What it Means for Nut Growers*

By: Safe Food Alliance | Contributing Writer



## RMC

RIPON MANUFACTURING COMPANY INC.

Lic# 251698

### A Worldwide Leader in Almond Machinery Technology

*Ripon Manufacturing Company 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.*

209-599-2148 / 800-800-1232 / [info@riponmfgco.com](mailto:info@riponmfgco.com)



[riponmfgco.com](http://riponmfgco.com)

Of the 7 rules included in Food and Drug Administration's (FDA) Food Safety Modernization Act (FSMA) regulations, the Produce Safety rule may be the most widely debated. After congress mandated in 2011 that the FSMA regulations be written, the FDA was assigned the difficult task of creating a rule for growers—a segment of the food industry they hadn't previously had any significant oversight of. The impetus for these new regulations was triggered by a notable increase in reported food safety incidents, likely due to many factors. These factors include a more complex supply chain, novel food items and new methods of preparation for existing items, better laboratory detection methods and new data analysis technologies, real-time communication of illnesses via social media platforms, and a 24-hour news cycle. In addition, the food safety incidents connected to the Peanut Corporation of America rattled the country, and prompted citizens to demand change.

All of this has led us to today. In January 2019, the FDA will begin enforcing the Produce Safety rule for any covered operations that fall into their categories of "small business" and "all others". In January 2020 the compliance date for the category "very small business" will pass and they will start seeing regulatory visits. In the mean-time, the FDA is currently training inspectors, educating industry members, and conducting **On-Farm Readiness Reviews**. The FDA is conducting these reviews for growers to help identify gaps in their programs and ensure that each operation understands how to comply. The reviews will be conducted by FDA staff members and state officials, and in some cases will include cooperative extension agents from universities, whose job it is to assist the industry.



It's worth noting that, here in California, the State California Department of Food and Agriculture (CDFA) will be conducting most of the inspections on behalf of the FDA. CDFA has implemented a Produce Safety program that includes education as well as these readiness reviews; you can learn more about it or sign up for a review of your operation here: <https://www.cdfa.ca.gov/producesafety/educate.html>

### Hullers & Shellers

It's important to note here that while this article is primarily directed to growers, **the "Produce Safety rule" also applies to many huller & sheller operations.** We won't spend a great deal of time here trying to clarify that issue, as we've already explored the subject in our last article about the Preventive Controls rule: <https://www.wcngg.com/2018/09/18/fsma-preventive-control-for-the-nut-industry/>.

Suffice it to say, as a huller/sheller you need to determine whether you fall under the "Produce Safety" rule or the "Preventive Controls" rule. This clarification comes down to whether you are considered a processor or a "secondary activities farm." Additionally, for huller/shellers that fall under Produce Safety rule, some sections of the rule will apply in a modified manner (for instance water, soil amendments, and animal control).

### What's Required

Below we've created a brief summary of the rule sections and requirements. To get a better understanding of the full scope of the regulation, we strongly recommend attending the official one-day training.

- **Water:** Inspection of the water

*Continued on Page 60*

**WE PRIDE OURSELVES ON  
THE BEST TREES GROWN  
ON VIRGIN GROUND**



**WITH SIX GENERATIONS OF  
FARMING WE HAVE THE  
ROOTS YOU CAN COUNT ON!**



## ALL WALNUT VARIETIES

**80 YEARS OF WALNUT  
GROWING EXPERIENCE**

Mark Crow 209-602-8394  
Norman Crow 209-988-4570  
[WWW.ORESTIMBANURSERY.COM](http://WWW.ORESTIMBANURSERY.COM)

Continued from page 59

distribution system. Sampling and testing the water for generic E. coli using approved methods, and maintaining a specific type of trend analysis as prescribed by FDA.

- **Soil Amendments:** Managing application of amendments in a way that minimizes risk. This includes a significant pre-harvest interval after application of any raw manure (if used).
- **Animal Control:** Inspect growing areas prior to harvest, and at reasonable frequency during growing periods based on risk. Of course, tree nuts will be

considered a lower risk than something like carrots or leafy greens, and require less in this category. Any produce (nuts) found to be contaminated (for instance, visible feces) must not be harvested for consumption.

- **Worker Training, Health, and Hygiene:** At minimum, annual food safety training for everyone as well as job-specific training for key roles. The rule lays out specific employee hygiene standards, which can be considered basic “GAPs” (good agricultural practices) such as hand washing.
- **Equipment, Tools, and Buildings:** Maintenance of equipment, proper storage and design, cleaning and sanitation at an appropriate frequency.
- **Records:** Each section above includes associated records. All records have to be true and accurate, completed in real time, and comply with record-keeping best practices.

### What's New With Water Testing?

Likely the most-contested part of the rule, the FDA has been interacting with the industry a great deal regarding its requirements for water management. As of late, the FDA proposed an additional two year extension of compliance dates (for produce other than sprouts), in addition to the original two year delay built into the rule. What this means is that the first compliance dates for water requirements would be in 2022, giving growers additional time to plan for compliance.

The other big piece of news with water testing is that the FDA will now recognize eight inch equivalent methodologies for water analysis, in addition to the originally-stated method 1603. This is good news for farmers because it will allow more flexibility for water analysis. Unfortunately all of the methods still include some very stringent sample handling requirements that will pose a challenge for many growers. Informa-



# Almond Hull Refining System

- › Efficient Removal of Small Twigs
- › Reclamation of Loose Meats
- › System Sizes:
  - 25 TPH
  - 31 TPH
  - 38 TPH
  - 50 TPH

- › Aspiration of Shell
- › Extraction Screening of Fine Shell

Reclaimed Meats

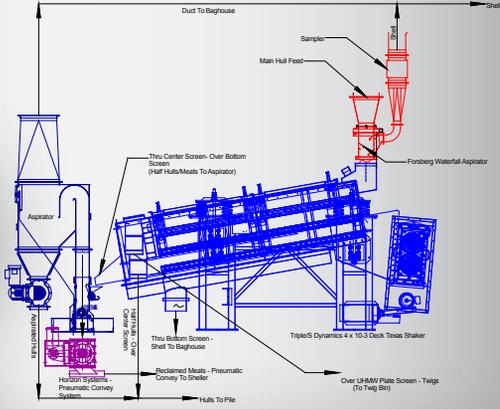


Removed Twigs



Fines










**P.O. Box 576627 | Modesto, CA 95357 | 209.577.4514**  
**sjss@sbcglobal.net | www.sjsystems.com**

tion about these methodologies can be found here: <https://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm575251.htm>.

At this time, we recommend you begin assessing your water distribution systems per the regulation requirements, map them out, and consider doing some testing to get a “baseline” for water quality. We have laboratories in Kingsburg and Yuba City that can help with this testing, and there may be other labs that also offer FSMA-compliant testing. Beyond that, we welcome any questions you may have and will do our best to help you.

### Mandatory Training

**The first step to compliance is training.** There is a mandatory one-day training developed by the Produce Safety Alliance, which covered operations must have someone attend. There are continued efforts by FDA and CDEA to make the



Produce Safety training available to growers, and our organization has been offering the training here in California for some time now. You can find our upcoming courses on the events page of our web site—<https://safefoodalliance.com/event> ). For a broader scope of learning in addition to this course, see <https://www.safefoodcalifornia.com> for our annual conference. Finally, the Produce Safety Alliance web site has a listing of all available courses nationwide: <https://produce-safetyalliance.cornell.edu/training/grower-training-courses/upcoming-grower-trainings/>

### Guidance from FDA on Compliance

The first FDA issued guidance for the Produce Safety Rule is geared toward “small and very small” growers, but may serve as a valuable source of information for any grower, providing insight into how FDA plans to enforce the rule. It includes topics such as employee health and hygiene principles, an explanation of exemptions, records requirements, and guidance on other sections of the rule. We encourage you to review it here: <https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ucm574281.htm>

### Hurricane Season and the Impacts of Flooding

Although this guidance is not from the FDA, the Produce

*Continued on Page 62*

**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](mailto: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](http://www.chemurgic.net)

Continued from page 61

Safety alliance has published a useful fact sheet related to flooding. The fact sheet explains appropriate ways for growers to deal with the aftermath of flooding with consideration given for the new requirements under the Produce Safety rule. Any growers in recently flooded regions, or buyers dealing with suppliers in those areas, should consider reviewing it. Visit <https://producesafetyalliance.cornell.edu/resources/general-resource-listing/>

### Exemption from the Rule

Finally, some nut growers and huller/sheller operations—especially those in the almond industry—are planning to claim the exemption laid out in section 112.2 (b) of the rule. This exemption is for products that receive commercial processing which will significantly reduce microbiological hazards, such as pasteurization, roasting, or baking.

**In order to take advantage of this exemption, you have to do two things:**

- First, communicate in documents accompanying the product, such as bin tags and shipping documents, that the product is raw. Specific language is required by FDA. The Almond Board of California has provided some excellent guidance on the matter here: <http://newsroom.almonds.com/content/produce-safety-rule-compliance-date-and-exemption-update>
- Second, obtain statements from customers (handlers) that they understand the products are raw, and will ensure that they get treated (pasteurized or cooked) before sale for consumption. The requirement for compliance with

this particular portion of the rule has been delayed, but some companies are already complying in the interest of being proactive.

For additional information on recent changes, you can visit <https://www.fda.gov/Food/NewsEvents/ConstituentUpdates/ucm575532.htm>.

For the FDA's main Produce Safety page, where all of these resources can be found, go to <https://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm334114.htm>

And finally, visit our web site to contact us or to sign up for communication from us regarding any changes or updates as they occur: <https://safefoodalliance.com/>

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*



**PACIFIC DISTRIBUTING, INC.**  
Distributor of... *Orchard-Rite*<sup>®</sup>  
WIND MACHINES & TREE SHAKERS

**PDI Chico**  
(530)-894-2755  
3195 Durham-Dayton Chico, CA 95928

**PDI Hughson**  
(209)-833-4032  
5724 E Whitmore Hughson, CA 95326

**PDI Selma**  
(559) 896-3222  
1029 Valley View Ct. Selma, CA 93721

**50**  
*Orchard-Rite*<sup>®</sup>  
YEARS STRONG

*Pure Power. Pure Performance. Pure Orchard-Rite.*





*Make Calcium an Integral*

— PART OF A SUCCESSFUL —

*Leaching Program*

Apply CaTs® for improved water infiltration and soil structure. CaTs® works by displacing sodium to flocculate soil colloids resulting in increased water movement through the soil.

The 100% soluble calcium and sulfur works immediately in the soil. The thiosulfate sulfur reacts in the soil to release additional calcium. CaTs® convenient liquid formulation allows for easy application with irrigation.

**Our Specialists can provide assistance regarding application, blending, field studies and technical data.**



START A CONVERSATION TODAY WITH YOUR *Crop Vitality Specialist*  
CALL (800) 525-2803, EMAIL [info@cropvitality.com](mailto:info@cropvitality.com) OR VISIT [CropVitality.com](http://CropVitality.com)

©2018 Tessengerlo Kerley, Inc. All rights reserved. CaTs® is a registered trademark of Tessengerlo Kerley, Inc.



# KNOW YOUR Roots

By: Rich Kreps | CCA

We are farmers. Our roots go deep. No other profession on the planet has stronger generational ties to a way of life. We are bound to our soil in so many ways and of course, so are our trees. The roots that bind have so many functions and often times, we don't look closely enough at which function we are trying to manipulate at any given time. Let's take a look at how we can better utilize the resources we have to maximize our production.

## Five Major Uses

Roots have five major uses: First, they anchor a plant. Weaving their net through the soil gives the tree a firm hold on the ground it covers to support the mass and structure to come. Second, they take in water and nutrition. Think of them as tiny straws feeding off the soil solution and pushing that liquid through the vascular system. Plants don't eat, they drink. As roots grow and forage, they create mass that secondarily stores the nutrients they absorb and stores the massive amount of carbohydrates a plant is making through photosynthesis. Fourth, roots are in a constant struggle with environmental stressors and pathogens to acquire the nutrition and development a tree needs for growth and reproduction. And last but not least, new research is emerg-

*Continued on Page 66*



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](http://www.TriCal.com)**

*Continued from page 64*

ing highlighting the chemical signaling roots provide to other plants and especially, the beneficial bacteria. This signaling is crucial to the symbiotic relationships created for proper health, production and vigor. It also triggers defense mechanisms to keep a tree healthy.

### **All Roots are not Created Equally**

Not all roots are created equally. A seedling develops a taproot that “taps” into deeper moisture in the soil and anchors the plant. This root grows quickly and is very thick in comparison to other roots. Many tissue culture and clonally developed rootstocks do not create a taproot. Even seedling propagated rootstock will lose the taproot once its transplanted from the pot to the field. Fibrous roots are all about the same size and branch out equally from the base under ideal conditions. The real work happens on an almost microscopic level with the fine root hairs. These little guys are a plants way of increasing the surface area of roots and dramatically increasing the interactions with the soil. Because the roots are below the surface of the ground, they don’t conduct any photosynthesis, but their big volume of mitochondria make for some serious energy production.

So that’s the way it is. Trees have roots, so what? On close examination, we see that those fine root hairs survive in an aerobic environment. In addition to soil solution, nut producing trees need oxygen to thrive. This comes in the way of pore spaces and irrigation timing creating that cycle of wetting and drying. We focus so much of our attention as farmers on keeping deep mois-

ture throughout the hotter months, but we don’t always pay much attention to how that water gets there. As the season progresses and farming gets more intense we become a slave to a specific schedule. We need to be a bit more cognizant of what an irrigation and more importantly, a fertigation event does in the soil.

### **Advancements in Technology**

Advancements in technology and specifically, irrigation technology has great promise in helping us better understand the movement of our soil solution below the surface. When specific soluble nutrients run through our soils there

*Continued on Page 68*



Feeder roots.

**Measure.  
Know.  
Advance.**

Soil Moisture Probes  
Advanced Software  
Telemetry

Call 530 488 0314  
sentekusa.com



HOSTED BY: **WEST COAST NUT** *Progressive* **Crop Consultant** *Organic* **FARMER**



Don't miss this **must attend** Ag Trade Show for all growers, processors and crop consultants.

**November 28, 2018**  
**7:00am - 1:30pm**  
 Kern County Fairgrounds  
 1142 S P St  
 Bakersfield, CA 93307

**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



**CE Units Offered**

**CCA: 5.5 Hours**

Soil & Water Management: 1.5  
 Integrated Pest Management: 3  
 Crop Management: 1  
 Professional Development: 0.5  
 Nutrient Management: 0.5

**PCA: 4.5 Hours**

Other: 4  
 Laws & Regs: .5

**07:00 AM**

**Registration**

**07:30 AM**

**Trade Show**

PCA-CE Credits: 15 minutes; Other

**PROFESSIONAL TRACK**

**GROWER TRACK**

**08:00 AM**

**Best Solutions for Controlling Nematodes in Your Soil**  
 Andreas Westphal, Department of Nematology, UC Riverside, Kearney Agricultural Research and Extension Center  
 CE Credits: 30 minutes; Other

**Management of Soilborne Diseases in Almond Orchards in Kern County**  
 Mohammad Yaghmour, UCCE farm advisor  
 CE Credits: 30 minutes; Other

**08:30 AM**

**The Newest on Mite Control for Almonds**  
 David Haviland, UCCE entomology and pest management farm advisor  
 CE Credits: 30 minutes; Other

**Nutrition Applications: What are the Best Management Practices?**  
 Richard Kreps, CCA

**09:00 AM**

**Laws and Regulations: Aluminum Phosphide and Vertebrate Control**  
 Monica Haskell Weinberg, Agricultural Biologist IV, Kern County Department of Agriculture and Measurement Standards  
 CE Credits: 30 minutes; L&R

**Live Demonstration—Best Management Practice for Preventing Pesticide Impacts to Groundwater**  
 Sarge Green, water management specialist, Center for Irrigation, Fresno State University  
 CE Credits: 30 minutes; Other

**9:30 AM Break**

**10:00 AM**

**Trade Show**

CE Credits: 15 minutes; Other

**10:30 AM**

**Weed Management—What's new in Chemical Treatments**  
 Kurt Hembree, UCCE farm advisor  
 CE Credits: 30 minutes; Other

**Growing and Producing Golden Hills Pistachios**  
 Craig Kallsen, UCCE farm advisor

**11:00 AM**

**What you Need to Know About Leaf-footed Bug for Better Control**  
 Kris E. Tollerup, PhD, UCCE advisor, UC Statewide IPM Program, CE Credits: 30 minutes; Other

**Improving Grape Coloration and Ripening Using the Plant Hormone Ethylene**  
 Ashraf El-kereamy, UCCE farm advisor

**11:30 AM**

**Update on Sterile Insect Technique to Control Navel Orangeworm**  
 Houston Wilson, Assistant Cooperative Extension Specialist—Tree Crop IPM, Kearney Agricultural Research and Extension Center, Department Entomology, UC Riverside  
 CE Credits: 30 minutes; Other

**Why an IPM Label Makes Sense for Growers, Consumers, and the Environment**  
 Surendra K. Dara, CE Advisor—Entomology and Biologicals, UCCE

**12:00 PM Lunch** | in NEW Lunch Area

**12:15 PM**

**NOW—Benefits of Mating Disruption**

Brad Higbee, field research and development manager for Trécé Inc. CE Credits: 30 minutes; Other

**01:00 PM**

**Adjourn**



Taproot from a seed.



## PBM Supply & MFG., INC.

Quality Agricultural Spray Equipment, Parts and Supplies  
[www.pbmsprayers.com](http://www.pbmsprayers.com)    [www.pbmtanksupply.com](http://www.pbmtanksupply.com)

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

**Chico - 530-345-1334**  
 324 Meyers St. Chico, CA 95928  
**Fowler - 559-834-6921**  
 3732 S. Golden State Blvd. Fowler, CA 93625  
**Murrieta - 951-696-5477**  
 41648 Eastman Dr. #102 Murrieta, CA 92562



**HAV Self Propelled Sprayers**



**Walking Beam Sprayers**



**Mixing Trailers**



**UTV Sprayers**



**Parts & Accessories**

*Continued from page 66*

are three ways they are picked up by the roots; mass flow, diffusion and root interception. If we continually flush those nutrients below the root zone by applying them too early in an irrigation event or apply too much water, we are wasting our money. We push them right out of the root zone, and more specifically, out of the area with the highest concentrations of fine root hairs, or feeder roots. Trying to get water to the deeper roots will often keep the fine root hairs near the surface too wet, for too long. We lose efficiency, kill beneficial soil microbes and bring on other sets of issues like phytophthora.

### **Load the Soil Profile**

A newer strategy that is taking hold is to load up the soil profile in late winter during dormancy. Let mother nature and rain water help to leach detrimental salts out of our surface root profiles. As temps warm up and our first root flush occurs, we can add some soluble



nutrients to the mix in small pulse shots to just feed the shallow roots. As the season progresses, adjusting the irrigation schedule to match ET's (evapotranspiration) should be confirmed with checking soil moisture probes against water movement. Let your one foot and two foot depths dry down to 30-40 centibars and pulse another shot of water. This will keep the deeper moisture from being depleted and smaller fertigation events can be managed to keep more nutrition where it can be absorbed. In the past five years many of my growers have seen a reduction in the total amount of nitrogen they have been applying while keeping in season tissue readings well into the sufficiency ranges. Applying less fertilizers in more frequent applications will also help us avoid over applying large amounts of nutrition that will just tie up with other elements that aren't absorbed. Plan some irrigation events to be longer to push water down a bit and shorter sets while applying nutrition.

Keeping our nutrition in the proper root zone for longer periods of time will dramatically increase it's efficiency. Over time it is also proving to increase yields and avoid waste. Knowing how your water moves in your specific soil types will allow you to fine tune your fertigation. Keeping those roots happy will go a long way to keeping you as a farmer well grounded.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

**F30 15**  
DESIGNED FOR EXPERTS

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

**TRY IT**  
10/26 MID-VALLEY  
11/06 SOUTH VALLEY

**ULTRA-COMPACT**  
**LITHIUM-ION BATTERY**  
**CHARGES IN 1.5 HOURS**

GOT QUESTIONS ?

  
www.infaco-usa.com

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

# THE LATEST SCOOP *on Red and Black Walnuts*

By: Cecilia Parsons | Associate Editor

**N**iche nut markets are driving demand for lesser known, but unique walnut varieties.

Black walnuts, more of a traditional mid-western nut crop are sparking interest in Idaho while the colorful red 'Robert Livermore' walnut cultivar is gaining attention as a high end restaurant item and in international markets.

## Red Walnuts

Chuck Leslie, director of the University of California Walnut Improvement Program, said that the Livermore variety was released for nursery propagation in 2002, and grower interest in the red cultivar is finally increasing.

In the last couple of years, he said, there has been a growing demand from nurseries for graft wood. The kernel coloring and less acidic flavor is attracting specialty markets and



**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



growers report premium prices.

“There has been a fair amount of interest recently due to demand in specialty markets. The red color attracts attention,” Leslie confirmed.

Leslie said when the cultivar was first released, there were concerns from nut processors that the red skinned nuts could not be kept separate from the brown-skinned kernels.

Named for a pioneer California rancher, the Robert Livermore is the first patented, red-kernel walnut in the state and was introduced to growers in 1999.

### **Robert Livermore Variety**

Leslie, who developed the Robert Livermore with Dr. Gale McGranahan, a fellow University of California (UC) researcher specializing in walnut breeding for rootstock and variety improvement, said they took terminal bearing red varieties and crossed them with Chandler, Howard and Tulare cultivars. They were selecting for yields and ability to extract kernel halves from the shell. At one time they were monitoring about 500 selections from those crosses.

The Robert Livermore is derived from a cross pollination between UC86-11 and Howard, a UC Davis cultivar released in 1978. Howard has typical extra light or light colored kernels. UC86-11 is a germplasm introduction obtained as scionwood identified as RA 1088 out of a walnut collection from Bordeaux, France. UC86-11 has a reddish brown seedcoat and a typical light cream-colored kernel. The cross made in 1991 resulted in 14 progeny of which six bore the red seedcoat. The Robert Livermore was chosen from among the progeny grown at the UC Davis field plots because early blooming—the fourth year from germination. According to the UC Davis review, about 90 percent of the lateral buds are fruitful and estimated yields are good, but not outstanding.

Robert Livermore leafs out and blooms near the Chandler variety and is ready for harvest about one week before Chandler. Pollination overlapped the bloom in three out of four years during testing. Other satisfactory pollenizers for Robert Livermore would be Tulare and Cisco.

Other UC descriptions of this variety include that it has a hard shell and a good seal. The kernel on average makes up 50 percent of the total nut weight. The red seedcoat is due to anthocyanidins.

Leslie said there could be some variation in the red color of the kernels from year to year. The color also tends to be deeper just after harvest and can fade out over time.

## Red Trees

Chico walnut grower Jimmy Bertagna said the 'red trees' were already in the ground when he joined the family nut growing business. His father, Nick Bertagna had planted a block of the Robert Livermore soon after its release from the UC program. The trees are now in their 15th leaf. Prices received for this walnut variety are higher than the brown skin varieties, but there has not been a consistent premium paid year to year, Bertagna said. Their business, Bertagna Family Nut Company, is gearing up to process and sell Robert Livermore walnuts to bulk customers.

The first shake of the harvest was done prior to Oct. 1 and a second shake is planned.

While the kernels are attractive, the trees themselves are 'the ugly step-children in the walnut family,' according to Bertagna. Cultural practices are the same as for their other walnut varieties, but he has seen the trees attract more than their share of walnut huskfly and mites. The nuts



Red walnuts.

# Simply the best...

## A Northwest will Outlast Everything on the Farm

Clean up post-harvest trash and prunings in *One Pass*.  
*Enrich* soil with organic nutrients for *tree health*.  
Release soil compaction for *better* water penetration.  
Most *heavy duty* machine on the market.

Look for our premier California dealers in:

<b>KERN MACHINERY</b> Bakersfield, CA Buttonwillow, CA Delano, CA	<b>LAWRENCE TRACTOR</b> Visalia, CA Hanford, CA Tipton, CA	<b>MAC'S EQUIPMENT</b> Kerman, CA Tranquillity, CA	<b>N&amp;S TRACTOR</b> Colusa, CA Dos Palos, CA Merced, CA Stockton, CA Turlock, CA Willows, CA Yuba City, CA	<b>RED BARN</b> Modesto, CA
--	---	--	--	--------------------------------

800.204.3122 | [www.nwtiller.com](http://www.nwtiller.com)

are somewhat more difficult to process, he said, due to a harder shell. Kernel half shell count is also lower than the Chandler.

Last year the United States Department of Agriculture (USDA) revised the U.S. Standards for walnuts in the shell and for shelled walnuts to allow grade certification of the Robert Livermore, removing obsolete references to an unclassified walnut category. The current U.S. walnut standards only permit the grade certification of four colors of walnuts: extra light, light, light amber, and amber.

According to the California Walnut Board, consumer demand for red walnuts is growing internationally. These revisions will provide the specialty crops industry with greater marketing flexibility.

### Black Walnuts

Black walnuts are another niche option in tree nut production.

Tony Garrison of the Treasure Valley area of Idaho said he began planting black walnut seedling trees 12 years ago. That part of Idaho is not known for black walnut production due to more extreme weather, but his block of trees is now producing viable crops and he is planning to supply local customers with black walnuts.

Garrison is also looking at two other avenues of income from his trees—lumber and shells which are used in industrial applications including cosmetics and cleaning products.

Garrison said he plans on marketing the black walnut kernels in chunks and selling some nuts in-shell. Three to four thousand pounds of in-shell nuts yield about 600-800 pounds of kernels. To prepare for larger crops in coming years, he said processing equipment is being developed to shell and sort the black walnut kernels. He has also planted about 500 new seedling trees.

Yvonne Barkley, an associate extension forester with University of Idaho supplied the following information about black walnut cultivation:

Crops ripen in September or October

*Continued on Page 74*



Jim Bertagna (Owner), Nick Bertagna (Owner & Father), and Greg Bertagna (Brother).

**NEW** FROM PACIFIC BIOCONTROL

**ISOMATE® NOW Mist**

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

**Jeannine Lowrimore**  
Northern California  
209.603.9244

**Christeen Abbott-Hearn**  
Central and Coastal California  
559.334.7664

Continued from page 73

and drop from the tree shortly after leaves fall. Production can be irregular with heavy crops coming two out of five years. Nut production 10-12 years after planting and peak production is at 20-30 years. The nuts have a distinct flavor and are marketed for use in baked goods and ice cream.

As nut production diminishes, the wood can be harvested for veneer. Ground shells have several industrial uses.

Black walnut seedlings are intolerant of shade and grow slowly the first few years while establishing large root systems. Once established, black walnut can grow two to four feet in height per year, reaching 100 to 120 feet at maturity. On the best sites, research has shown that it is possible to grow 16-inch diameter black walnut sawlogs in 30 to 35 years and larger, veneer-quality logs in 40 to 50 years. Black walnut responds well to basic cultural practices, such as pruning and thinning, with increased growth and quality in only a few years.

### Drawbacks

There are some objectionable characteristics of black walnut. They produce a substance called juglone, which is selectively toxic to certain other species of plants. Highest concentration of the chemical is in the roots and fruit husks. The trees' deep taproots makes it difficult to transplant and it will not tolerate extreme heat or dryness.

Barkley recommended planting the Purdue #1—a hybrid black walnut developed at Purdue University. This variety has been tested in Idaho climates and was found to be productive. The Purdue #1 is patented and has strong central leader tendencies and is late to leaf out increasing the chances of escaping frost damage.

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*



Red walnuts.



## Clonal Rootstocks

*from Lab to Field*

**VX211, RX1, Vlach**

*Call Us Today.*

**916-655-1581**

**Parm Randhawa**

**[parm.randhawa@csplabs.com](mailto:parm.randhawa@csplabs.com)**

**3556 Sankey Road, Pleasant Grove, CA 95668**

# ***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](http://wrtag.com), or contact Joseph Witzke at (209) 720-8040

# WINTER SANITATION: *The Foundation* of Navel Orangeworm Control

By: The Almond Board of California



## GET EVERY NUT



The New Schmeiser V-Blade Roller combines all the advantages of a durable V-Blade with a Rear Roller to provide groove-free smoothing and reduced loose dirt at the row ends.

Contact us for complete details.

**T. G. SCHMEISER® CO., INC.**

1-800-288-8128 • [www.tgschmeiser.com](http://www.tgschmeiser.com)

Now is the time to break the link between mummy nuts and overwintering navel orangeworm (NOW). While winter sanitation is important every year, it is increasingly critical this year, with rejections from almonds harvested in 2017 reported at higher than two percent. These significant rejection rates were due to an overly wet winter that presented challenges for mummy nut removal and follow through of winter sanitation. In addition, the wet winter was followed by a warmer-than-normal growing season in 2017 that resulted in higher and earlier NOW populations, with an additional late season NOW generation that resulted in higher insect pressure.

### Keep Rejection Levels Below Two Percent

According to the Almond Board of California (ABC), the working goal is to keep almond harvest rejection levels below two percent and to strive for one percent, or less. If a grower's average damage is over two percent, it is critical they take a closer look at overall practices and specifically adopt stronger winter sanitation measures, which are the foundation for any NOW control program.



Winter is a key time to practice winter sanitation and prevent NOW outbreak later in the year. All photos courtesy of the Almond Board of California.

- **Insight:** Reject numbers like two percent on the grade sheet translate to even higher losses for growers. Estimates are that actual losses are double what the grade shows because a good working assumption is half of the damaged kernels are blown out during harvest or removed at shelling, and these hidden losses are in addition to handler reject quality deductions shown on grade sheets.

Concerns over rejection rates span beyond direct crop damage and quality because NOW damage is also associated with aflatoxin. In addition to the direct damage NOW causes the kernel, the damage opens the door to fungal infections and contaminants, particularly to the fungi *Aspergillus* spp. and the aflatoxin contaminant it produces.

The stringent tolerances for aflatoxin contamination in key export markets like the European Union and Japan raises the importance of this yearly integrated management practice.

### Mummy Nut Removal Key to Success

Winter sanitation, the cornerstone of NOW pest management, involves the removal and destruction of mummy nuts—nuts that remain on the tree after harvest—to prevent overwintering NOW and prevent two-year mummy kernels being harvested the following year. It's also part of being a good neighbor, as NOW can travel to other almond orchards if many mummy nuts remain.

*Continued on Page 78*

**SANITATION SOLUTIONS**

**Send us a sample of your mummies.**

**WE WILL TELL YOU HOW TO SAVE YOUR CROP FROM NAVAL ORANGEWORM DAMAGE!**

**Integral Ag, Inc.**  
Independent Consulting and Research

**integralaginc.com**

**1.530.809.4249**



Remove mummy nuts before bud swell by hand poling or mechanically shaking, or both.

*Continued from page 77*

To reach the goal of two percent damage or less, growers should follow the guidelines below, which vary by growing region.

1. **Before January 15, and preferably earlier:** Count the mummy nuts and examine 20 trees per block (see steps on the UC IPM Mummy Nut website). If an average of two or more mummy nuts per tree (and even lower in the southern San Joaquin Valley) are found on or before January 15, get out the shaker or poling sticks and remove mummies in the entire block.
- For the northern and central growing areas, the guideline is to remove mummies down to an average of no more than 2 mummies in the canopy per tree. Cleaning both softshell and hardshell varieties is important as they are both overwintering sites for NOW. For hardshells, NOW readily overwinter in the hulls instead of infesting the kernels directly.
- For the southern growing areas, the sanitation goal is much lower and averages 0.2 mummies per tree in the canopy. Furthermore, there should be no more than 8 mummies

per tree left on the ground that have not been destroyed.

- The NOW prediction calculator can help growers determine the level of infestation risk. Though the calculator was developed for the southern San Joaquin Valley, it is a good baseline indicator for northern growing areas.
2. **Before February 1:** Remove mummy nuts from trees before bud swell, typically before February 1, by mechanically shaking the tree or hand poling, or both.
  - Wetter conditions—drizzly, wet and foggy weather—help nuts come off the trees more easily. An overly wet weather may discourage growers from completing sanitation because of access with shakers, as was the case in the 2016-17 winter. However, in that case it is recommended that growers give serious consideration to hand poling. In the 2016-17 winter, reluctance to sanitize contributed to the high percentage of NOW damage—meaning bigger headaches in the long run.
  3. **Before March 1:** Blow or sweep fallen mummy nuts to the row centers and destroy them by flail

mowing, especially where ground cover is not present or in years with dry winters. This timing is critical as mid-March is when the NOW flights begin.

Growers who have been implementing these cultural practices in their orchards and who still experience rejection levels greater than two percent should seriously consider other NOW management practices including more focus on timely harvest, in-season sprays and NOW mating disruption.

## Responsible Practices Maintain Open Markets

The European Union, one of the biggest importers of California almonds, has tight regulations and a low threshold for aflatoxin levels. To maintain open market opportunities in Europe, the Almond Board of California created the Pre-Export Checks (PEC) program for handlers planning to ship almonds to Europe. The PEC program is a systems approach to aflatoxin mitigation, based on the handler using specified procedures to sample, test and ship almonds to Europe.

To maintain these market opportunities, growers must do their part and be intentional in practicing winter sanitation to ensure the best product is being produced for industry consumers.

Mummy nuts have been identified as the link between one season to the next for overwintering NOW. It becomes an insidious cycle if mummies are left in the orchard, as they become a food of subsistence for NOW. Therefore, growers are strongly encouraged to minimize or break down this link to prevent continued pest damage and should continue practicing winter sanitation for years to come.

To learn more about winter sanitation and minimizing navel orangeworm, visit <http://www.almonds.com/pests>. Also visit the UC IPM site, <http://www.ipm.ucanr.edu>, and click on 'Agricultural Pests,' then 'Almonds.'

*Comments about this article? We want to hear from you. Feel free to email us at [article@jcsmarketinginc.com](mailto:article@jcsmarketinginc.com)*

**NEW** from Trécé!

# CIDETRAK<sup>®</sup> NOW MESO<sup>™</sup>

**MATING DISRUPTION PRODUCT FOR NAVEL ORANGEWORM**

*Only 20 Dispensers/Acre – for Full Season Control  
**AND No Moving Parts!***



Navel Orangeworm,  
*Amyelois transitella*



CIDETRAK<sup>®</sup> NOW MESO<sup>™</sup>  
Dispenser in use



Ready-to-use carrier pack

**THE ONLY MATING DISRUPTION** product on the market today approved for organic use in California nuts!

### Features:

- High performance mating disruption proven in university and government trials
- Dramatic reduction of dispenser rate **and** "no moving parts"
- Full-season "temperature dependent A.I. release"
- Non-toxic
- Patented, high performance hanging device
- Apply with a simple pole applicator
- Personalized ready-to-use carrier pack

### Benefits:

- Significantly reduces damage with a properly managed approach
- Significantly less labor, less cost **and** "no mechanical worries"
- Proper pheromone release synchronized with NOW adult action
- No residues, MRL's or worker safety to worry about
- Fast application, less labor and no branch scarring
- Fast, low cost application
- Convenient application, better inventory control - less material/less labor

**NEW**

**CIDETRAK<sup>®</sup>**  
CMDA+NOW MESO



MATING DISRUPTION PRODUCT  
FOR WALNUTS FOR CODLING MOTH  
& NAVEL ORANGEWORM



INSECT PHEROMONE & KAIROMONE SYSTEMS

Your Edge – And Ours – Is Knowledge.



**CAIN**  
**TRUCKING**  
INCORPORATED



# COMPOST

**100% FULLY COMPOSTED DAIRY MANURE**  
**The leaders in Dairy Compost manufacturing**

**“You call-  
We haul!”**

*Servicing the Valley since 1925*

**Custom blending available**

**Gypsum – Limestone - Sulfur**

**Call Today! 559-686-5707**

**Problems with Dust?**

**We're the experts for your dust control needs!**