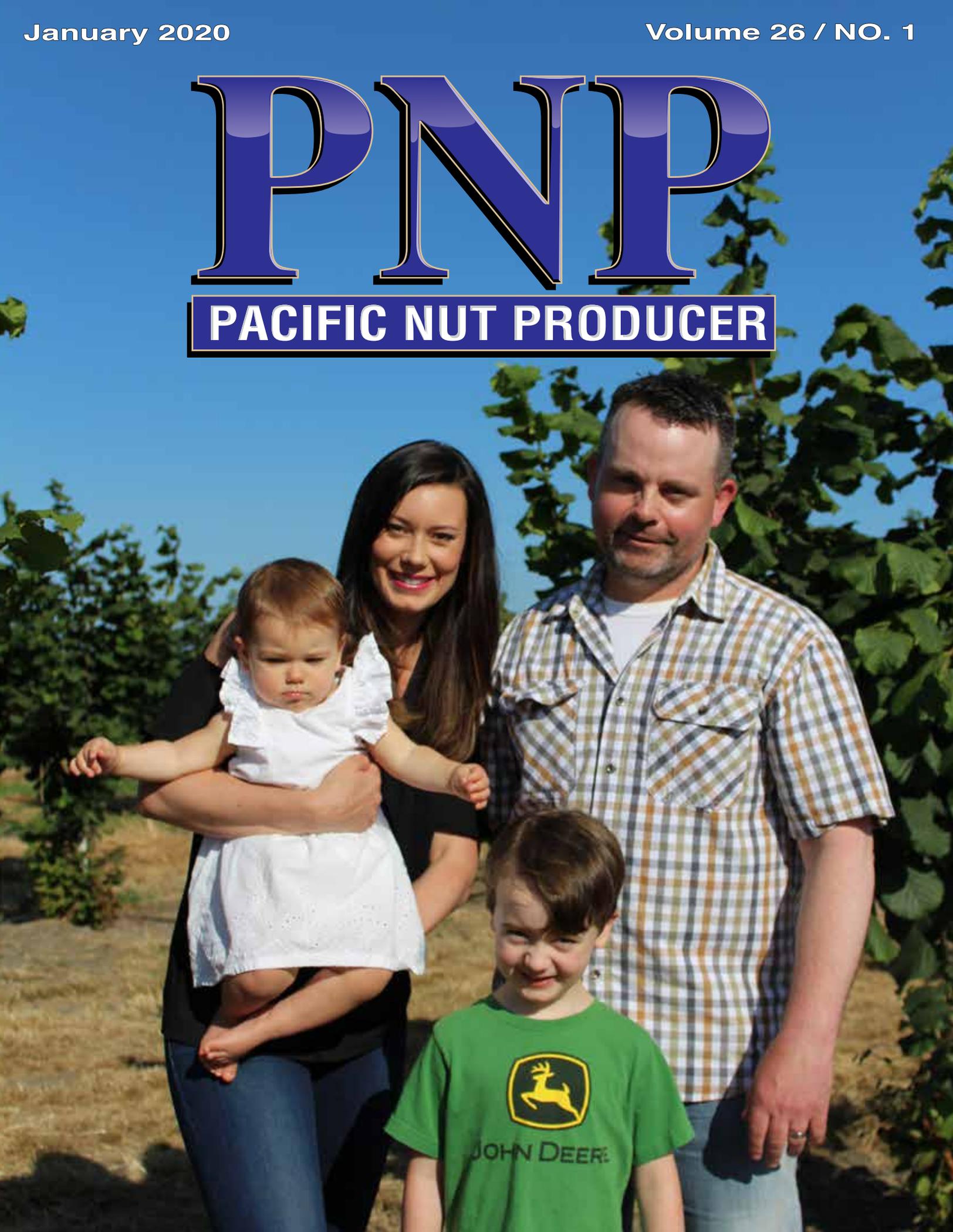


PNP

PACIFIC NUT PRODUCER

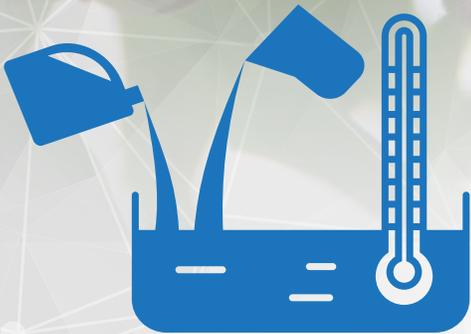


Ag Fact #237:

NOT ALL LIQUID COPPERS ARE CREATED EQUAL

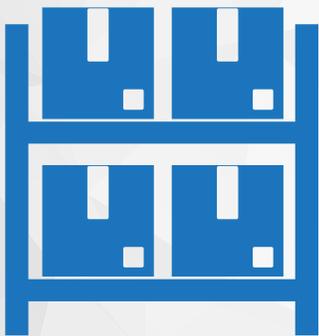
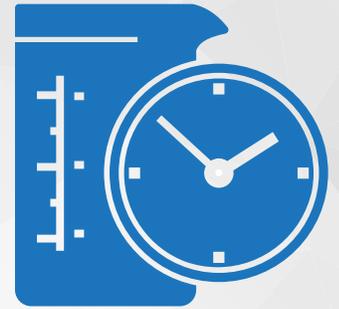
Badge[®] SC

Fungicide/Bactericide



EXCEPTIONAL
MIXING
EVEN IN
COLD
WATER

GOES INTO
SOLUTION
STAYS IN
SOLUTION



AMAZING
STORAGE
STABILITY
WITH NO
SEPARATION

COPPER + COPPER
OXYCHLORIDE + HYDROXIDE

PROVEN PERFORMANCE

DUAL COPPER PERFORMANCE

Badge's BluDuo™ patented formulation technology brilliantly combines copper oxychloride, known for its safety and resistance to wash-off, with the fast acting power of copper hydroxide.



Oregon diversified farmer Paul Kuehne with wife, Brynn; son, Rhett; and daughter, Sailor. Kuehne (owner of Creekside Valley Farms) invests in his family's future with hazelnuts.

See story page 4

Photo by Matthew Malcolm.

PNP

Jan. 2020

PUBLISHER
Dan Malcolm
dan@malcolmmmedia.com

EDITOR
Patrick Cavanaugh
editor@malcolmmmedia.com

ASSISTANT EDITOR
Matthew Malcolm
matthew@malcolmmmedia.com

ASSOCIATE EDITORS
Dan Clarke
Theresa Oliveira-Drumonde

COPY EDITORS
Monica Malcolm
Marina Malcolm

PRODUCTION MANAGER
Michael Lawless

ORCHARD TASK ADVISORS

Macadamias
Alyssa Cho
University of Hawaii at Manoa

Pistachios
Bob Beede
UC Cooperative Extension Emeritus

Pecans
Richard Heerema
NMSU, Las Cruces

Almonds
Brent Holtz
UC Cooperative Extension

Advertising • 559-298-6020

Dan Malcolm
National Sales

Danny Malcolm
Director of Sales

PACIFIC NUT PRODUCER



*The Authoritative Voice of
the Nut Industry
Trusted & Essential*

Contents

PACIFIC NUT PRODUCER

- 4** **Establishing a Hazelnut Orchard**
Diversified Farmer Paul Kuehne Invests in the Future
- 8** **Almond Set Versus Final Yield**
Time to Cut Back on Hives Per Acre?
- 28** **Ensuring a Healthy & Nutritious Crop**
California Almond Growers Put Quality & Safety First
- 34** **Meet L. J. Grauke**
Behind the Scenes Pecan Breeder
- 36** **The Power of Pistachio Industry's Generic Program**
Analysis Quantifies Value of APG Marketing Efforts

Orchard Tasks

12 Almonds

19 Pecans

22 Pistachios

Departments

38 MARKETPLACE/CLASSIFIEDS

Published By Malcolm Media

Pacific Nut Producer (ISSN 1087-4674) is published monthly by Malcolm Media • Ag Publishing, 600 W. Sierra Ave., Clovis, CA 93612 (subscription rate \$25 U.S. - \$75 International).

• Periodical postage rates paid at Clovis, Calif. and additional offices.
• **POSTMASTER:** send address changes to Pacific Nut Producer, P.O. Box 626, Clovis, CA 93613-0626.

Circulation
Verified
by



pacificnutproducer.com



Establishing a Hazelnut Orchard

Diversified Farmer Paul Kuehne Invests in the Future

By Matthew Malcolm, Assistant Editor

Just as the landscape of the Central Valley of California has rapidly filled with almond, walnut and pistachio orchards in recent years, the Willamette Valley of Oregon is also undergoing a major transformation as the epicenter of hazelnut production in the United States that continues to increase. As of August 22, 2019, Pacific Ag Survey LLC reported a total of 80,308 acres of Oregon hazelnut orchards, and growers continue to plant more every year. Just in the year 2019, Pacific Ag Survey reported +1,607 acres of new hazelnut orchard plantings in Oregon – 200 acres of which came from diversified farmer Paul Kuehne. Fall is arguably the best time to plant hazelnut trees, and Kuehne particularly enjoyed planting this fall with the minimal amount of rainfall that occurred.

Not many Oregon farmers are more diversified than Kuehne.

Owner of Creekside Valley Farms, Kuehne farms about 12,000 acres, consisting of: an apple, pear and hazelnut nursery; grass seed; blueberries; grapes; garlic; clover; radish; and about 2,500 acres of hazelnuts. Kuehne also provides many services to other growers including: custom farming, custom farm applications, farm drainage, leasing and more.

What Came From a \$15/Acre Investment

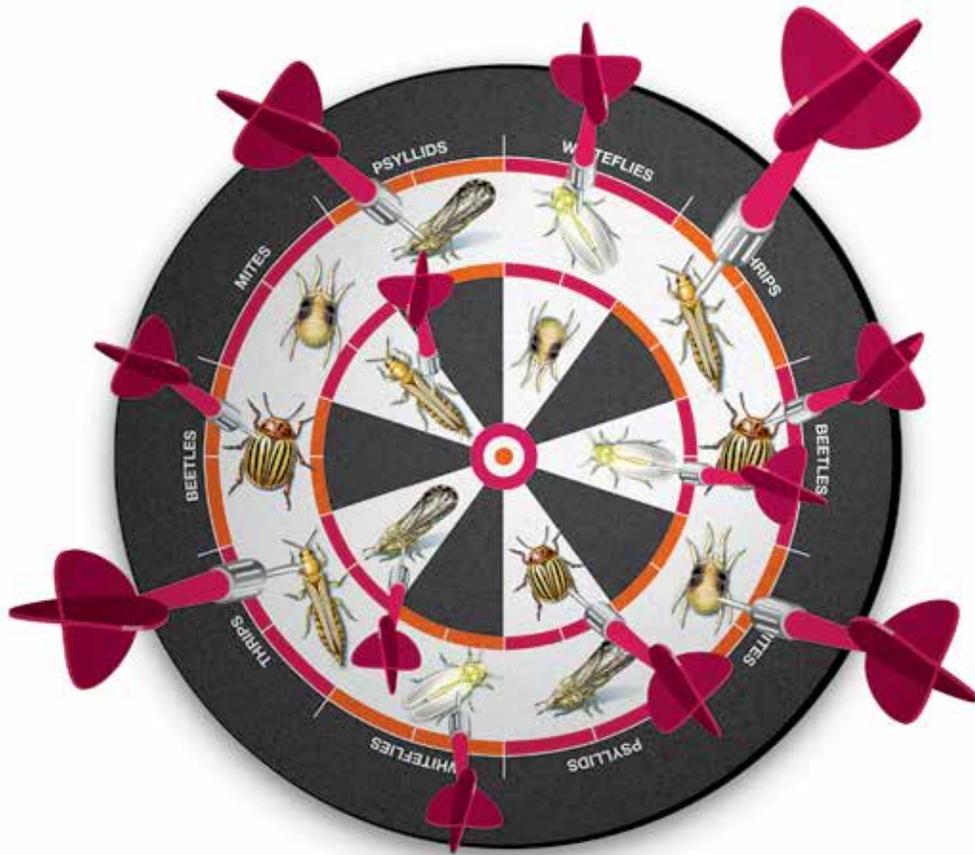
Kuehne didn't always grow hazelnuts. He grew up farming beef cattle and grass seed. "My grandfather started farming in the Pacific Northwest during the Great Depression," he explained. "He bought his land for only \$15-\$25/acre. My father Harold still farms grass seed on some of that land."

Kuehne started getting into hazelnuts while attending college in 1998, when he rented an orchard.

He graduated from Oregon State University (OSU) with a General Ag degree, and planted his first hazelnut orchard in 2011. Up until then, he had been leasing a lot of older Barcelona orchards. Like many others, Kuehne took much more interest in hazelnuts once OSU released the Eastern Filbert Blight resistant varieties (and the price of hazelnuts on the market went up). Relative to the grass seed industry and other ag commodities, hazelnuts also have a low equipment capital requirement and reduced labor demands, so they have become quite appealing to the Pacific Northwest farmer. "It's also a permanent crop, so you don't have the task of starting all over again every season," Kuehne shared. "It's something that can be invested in and passed on to the next generation."

Kuehne and his wife Brynn have two children, Rhett and Sailor.

(continued on page 6)



LOOK OUT, PESTS. MINECTO PRO DOESN'T MISS.

Minecto® Pro insecticide delivers exceptional control of difficult-to-manage pests in your crops. With its premix formulation of two powerful modes of actions, Minecto Pro offers extended residual control of pests including psyllids, mites, whiteflies, thrips, beetles and worms. Minecto Pro is designed to protect specialty crops including citrus, tree nuts, pome, potatoes and vegetables. When you have difficult-to-control pests in your crops, make sure your insecticide doesn't miss.

To learn how Minecto Pro can help protect your crops from pests, visit [SyngentaUS.com/MinectoPro](https://www.syngenta.com/MinectoPro)

 **Minecto® Pro**

syngenta®

Hazelnut Orchard

(continued from page 4)

It's far too early to tell if they will someday carry on the farming tradition, but Kuehne feels a lot more comfortable that they will have the opportunity with hazelnuts.

Yamhill is a Winner

Back in July, one of Kuehne's orchards in Millersburg, Oregon was featured at the Nut Growers Society's annual Summer Tour. Hundreds of growers and prospective growers visited to learn the early years of managing a hazelnut orchard. Standing in a third leaf orchard with Yamhill and Wepster varieties (with York and McDonald as pollinizers),



Paul Kuehne showcases his young hazelnut orchard in Millersburg at the Nut Growers Society 2019 Summer Tour.



New Oregon State University hazelnut varieties have resistance to Eastern Filbert Blight, but they are not invincible. Young trees are also susceptible to Bacterial Blight (as depicted here).

Kuehne explained that the biggest risk in a grower's investment in the trees is Eastern Filbert Blight. "These varieties with the Gasaway gene have good resistance but they're not perfect," he said. "So stay on top of your management practices... I think Yamhill is my favorite as it appears to be more productive, require less pruning and have the most resistance to Eastern Filbert Blight and bacterial blight."

Kuehne's orchard was laid out on a 20x10 foot diamond formation – that way in about ten years or so when the trees become more productive and begin to crowd each other, he can remove every other tree, and likely stick with the Yamhill variety. "We doubled up so we could have the option of what variety to keep and get more production out of the orchard in its initial years."

As growers don't start harvesting hazelnuts until the fourth leaf, Kuehne still wants to get some revenue off of the orchard in the first few years, so he showed tour attendees the perennial ryegrass crop he cultivates between hazelnut rows. "This is our 3rd leaf, so we'll do another harvest of grass seed next year and expect to harvest about 1000 pounds of hazelnuts/acre next year following the grass seed crop.

Drainage & Blight

Oregon growers generally get a lot more rain than California growers do, and as well-drained soils are critical for tree nuts to be productive, Kuehne is also a firm believer in installing drain tile before establishing an orchard. It's not cheap, but it sure pays off in the long run with better production.

"One year we planted an orchard and the following spring, we had about 10 inches of rain," he expressed. "Then we had a lot of bacterial problems show up.

Trunk guards can be a blessing and a curse (sunburned trunk).

We are grateful for the enhanced drainage and our Yamhill variety that proved to be the most resistant to the blight.”

Bacterial blight is a serious issue for young hazelnut trees, and Kuehne recommends minimizing the risk with a couple applications of copper sprays in the fall around the first rains, and then a couple more as the leaves begin to drop. “Wherever the weather is wetter, bacterial blight will be more problematic,” he said. “We still suffered losses to bacterial blight, but if there was a sucker available, we just cut out the main tree and train it back up on a healthy sucker. We haven’t had any problems with the sucker coming back with blight, so it has worked out great overall. On the ones that didn’t sucker, we just replaced them.”

Irrigation

On dryland farms, Kuehne recommends adding a sawdust mulch at the base of the tree upon planting for better moisture retention. For growers that have access to water, drip irrigation is especially beneficial

(continued on page 46)



**INVESTING IN KNOWLEDGE
TO SUPPORT OUR GROWERS**



Pioneering the Future

Learn about our water soluble and controlled release fertilizers:
www.Haifa-Group.com

Almond Set Versus Final Yield

Time to Cut Back on Hives Per Acre?

By Joe Traynor, Scientific Ag

The sole purpose of plant and animal species is to pass on their genes to the next generation and to future generations. For almonds, it is the seed or kernel that transmits these genes. Before modern farming, isolated almond trees produced maybe 100 almonds per tree. Today, with ample compatible pollinizer varieties for cross pollination and with good populations of pollinating insects (mainly honey bees) an almond tree can produce 14,000 almonds (aka kernels or meats) per tree, which

translates to roughly 3,000lbs./acre.

Almond flower production can vary from 40,000 to 90,000 blossoms per tree so all it takes in most years is a 25% set to get a 3000lbs./acre crop. Individual almond flowers produce 40,000+ pollen grains per flower. Since all it takes is one pollen grain to set an almond, accomplishing a 25% set is not an unreasonable task for bees. Barring catastrophic weather, many more almonds will be set from pollinated flowers than the trees can hold. Drop of pollinated nuts starts after petal fall in March



and continues through June. The tiny nutlets from flowers that were not pollinated start dropping within a few weeks after petal fall and can be distinguished from pollinated nutlets by pushing them with your thumb – pollinated nuts will remain on the branch or spur, those that weren't pollinated won't. A significant drop of pollinated nutlets occurs every year. This drop can be discouraging but is Nature's way of balancing crop load with overall tree health.

An almond tree not only has to bring its kernels to the finish line (to harvest), but must also drag the hulls and shells along with them. Because green almonds are 52% hull (vs. 14% kernel and 32% shell) bringing hulls to harvest represents a significant drain on a tree's resources. The hull burden on almond trees is analogous to requiring a runner to carry 50lb. weights during a 1 mile race – the runner can discard the weights before reaching the finish line, the almond tree cannot. The almond tree compensates by shedding green almonds – hulls, shells and kernels.

Almond trees and peach trees are closely related. Peaches command a high price (around \$500/ton) because of their tasty flesh (called "endocarp") that surrounds the

Rooted in innovation...

PLAN TODAY FOR TOMORROW'S ORCHARD

We have high quality stock of almonds, apricots, cherries, nectarines, peaches, pears, and fresh and dried plums for great prices!

Order Early for 2020 & 2021

Fowler
NURSERIES, INC.

Call Us Today! (800) 675-6075
www.FowlerNurseries.com
Newcastle, CA



and is optimistic about, developing new markets for their nutritious almond hulls.

Like almond trees, peach trees also drop pollinated fruit after petal fall, but not enough for the remaining peaches to reach optimum marketable sizes. As a result, peach growers spend up to \$1400/acre to thin peaches, a major expense not incurred by almond growers. Unlike almond growers, peach growers get

little or nothing for their peach pits or for the seeds within the pits.

During almond bloom in 2013, USDA workers counted the number of pollinated almonds set on limbs in a Kern County almond orchard stocked at 3 bee colonies/acre and compared them with those from an orchard stocked at 1.5 colonies/acre. The almond set was determined after petal fall and was significantly

(continued on page 10)

seed-containing pit. The endocarps (hulls) of almonds are, like peaches, high in sugar and nutrients making them an excellent and tasty feed for dairy cattle. With current problems in the dairy industry plus more hulls from increased almond acreage, hull prices have dropped from \$120 to \$60/ton in recent years. Income from almond hull sales is a nice source of extra income for almond growers; it used to be enough to cover hulling costs, but not anymore. The almond industry is working on,



The industry is optimistic about developing new markets for nutritious almond hulls

PLAN NOW FOR 2021

EXCEEDING EXPECTATIONS

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

We have a choice of Vlach or RX1 clonal walnut rootstocks still available for 2020.

CALL 800-828-TREE, stop by the Oakdale or Fresno office or visit burchellnursery.com **NOW** for the best selection of walnuts for 2020 or for all your orchard needs in 2021.

© 2019 The Burchell Nursery, Inc.

BURCHELL NURSERY

burchellnursery.com 800 828-TREE

Almond Set

(continued from page 9)

higher (around 80%) at the higher stocking rate. This higher initial set did not translate into higher yields because of the higher drop of green almonds – the higher the initial set, the greater the later drop. Final yields on both plots were about the same. The take-home message: higher bee stocking rates will increase the number of almonds that are set, but will have no effect on final almond yields.

Current bee recommendations for almonds are to use 2 colonies of bees per acre, with the colonies to average 8 frames of bees per colony. Some crop insurance companies accept 16 frames of bees per acre, which can be supplied by 1.5 colonies of 12-frame strength. 2 colonies/acre has been, and currently is, the accepted bee stocking rate for almonds, in spite of the fact that there is no solid data to back up this recommendation.

Because the flight range of bees is 2+ miles, an adequate test for bee stocking rates would require comparing yields on an isolated orchard stocked at 2 colonies per acre with one or more orchards at least 2 miles away stocked at 1 colony per acre or less – both orchards would need to have identical cultural practices. Such isolated orchards have never been found, which is why there never has been, and probably never will be, an acceptable study on bee stocking rates.

The original bee-stocking rate was published by UC in 1947 in Circular 103 on almond culture: “In general, 1 hive per acre is ample, even in adverse seasons.” One could quibble about



the use of the term “hive” (rather than colony or frames of bees), but this recommendation should still hold today. A number of growers use only 1 strong bee colony per acre and are happy with their excellent yields.

The cool, rainy 2019 almond bloom certainly qualifies as an “adverse season” for almond pollination, yet final almond yields were far better than many expected or predicted in March – a good indication that bee stocking rates were more than ample. Most almond growers could trim their operating budgets significantly by using half as many bee colonies as they currently use. They may have to show their crop insurance agent that they are renting strong bee colonies and spend time convincing these agents that they are supplying their orchards with ample numbers of bees, even at a stocking rate of 1 colony/acre. Crop insurance requirements are the biggest impediment to growers that would like to cut back on their bee numbers. Almond growers should enlist the support of UC and the Almond Board to convince crop insurance people that current bee requirements are excessive. PNP

DON'T OVERLOOK THE IMPORTANCE OF WINTERIZING YOUR DRIP SYSTEM

Prepare your system for next spring and maximize the opportunity for a high distribution uniformity. A winterization provides a single scrub maintenance application to rid current irrigation fouling.

Contact Our Ag Water Specialist to Learn More 209 900-4500

www.meras.com

meras
WATER SOLUTIONS

MAXIMIZE YOUR YIELD POTENTIAL



Key first steps to increase nut set, size and yield.

Add **Top Set**, **Vigor SeaCal** and **Agro-Best 9-24-3** to your pink bud/early bloom sprays.

Right nutrients
Right time
Right form
Right mix

Maximizing profitability in your almond orchard starts with maximizing nut set every year. Achieving consistent set is key to higher yields and profitability. The secret is ensuring your trees have the right nutrients, at the right time, in the right form and right mix.

Nut set is influenced by boron which stimulates pollination. Boron is synergistic with calcium and enhances its affect. Molybdenum plays a direct role in nut set and retention by increasing pollen production. Moly also synergizes boron. Agro-K's Top Set DL is the right tool to apply from pink bud through bloom. Top Set DL supplies a balanced nutrient mix that significantly improves nut set. It is soft on blooms, bees and other beneficial insects. It penetrates tissues rapidly and thoroughly to drive increased nut set.

Once set, nut size and weight is the next step to maximizing yield. Size is driven by cell division and phosphate is a key energy source that drives this process. Calcium is a critical factor in nut weight. Getting it into the nut during cell division is the key to heavier nut meats. Getting calcium where it is needed at this peak demand timing is therefore very important.

Applying Vigor SeaCal provides plant available calcium along with an effective seaweed nutrient to help reduce biotic stress that the tree goes through during bloom.

Vigor SeaCal also supports uptake of phosphate for increased cell division which leads to increased nut size. Tank mixing AgroBest 9-24-3 a high phosphate/low potassium blend, with Vigor SeaCal delivers the energy inputs the tree needs to maximize nut cell division, nut size and nut retention. AgroBest 9-24-3 is the most cost effective liquid phosphate available and specifically designed with minimal potassium content for early season foliar applications to give you more P per dollar and less K at a time when the tree requires very little K. Foliar applications of potassium applied during cell division will antagonize calcium uptake and negatively impact cell wall integrity and nut weight.

This spring make the most of your pink bud/early bloom sprays and set the stage for increased yield on your farm. Talk to an authorized Agro-K dealer today about how Top Set DL, Vigor SeaCal and AgroBest 9-24-3 can help maximize your profitability.



CORPORATION

8030 Main Street, NE • Minneapolis, MN 55432 • 800-328-2418 • www.agro-k.com

Science-Driven Nutrition™

Top Set DL
Vigor SeaCal
Agro Best 9-24-3

PNP's

January

Orchard Tasks

Almonds

By Brent Holtz, Ph.D.

I hope it keeps raining and snowing! I went skiing in December, conditions were wonderful, and it was nice to see lots of snow in the mountains. Hopefully the rain will continue. Another wet winter will help in filling our reservoirs, recharging our ground water, and leaching out salts that have accumulated in our orchard soils.



Honeybees are needed for pollination and growers should protect and promote bee health and flight inside orchards.



Brent Holtz, Ph.D., is a Farm Advisor and County Director of UC Cooperative Extension, San Joaquin County.

The Almond Board of California has a nice publication “Honey Bee Best Management Practices for California Almonds” that I would encourage everyone associated with the almond industry to read.

Communicate with your beekeeper on hive placement to decrease possible theft and maximize bee flight. Usually, we place hives around the perimeter of orchards, especially with small fields. But hives on the perimeter are easier to steal, so try to place hives towards the center of your blocks, preferable in spots where they will receive sunshine. It is desirable to place hives where the entrances receive the earliest sun, facing east or south. But bees are often delivered on pallets, with 4 boxes to a level, and that means hive entrances are pointing in all directions. Work with your beekeeper for obtaining a secure site with maximum sunlight at the earliest timing.

Studies from Wonderful in Kern County have shown a relationship between bee colony density and yield, that orchards with stronger beehives, with more frames of bees per acre, had higher yields. This study suggests that colony strength is very important in maximizing yields and that we should not skimp on the number of bees we place in our orchards. During bloom, if it becomes necessary to spray with a fungicide, try spraying in the evening when it is dark. Avoid applying insecticides while beehives are in your orchard and try to avoid tank mixes that contain a lot of different products. Fortunately, you have plenty of options to control insect pests or apply foliar nutrients after bees have been removed from your orchard. Bees can be removed from your orchards after the flower pollen

(continued on page 14)

**All Almonds
All The Time**

**Growers, Huller/Shellers, Processors -
We support all of you!**

**Almond Alliance is the ONLY
trade association fully dedicated
to protecting the entire almond industry.**

**Become a member today and make
our industry stronger together!**

Almond Alliance
OF CALIFORNIA

Information • Assistance • Advocacy
almondalliance.org • 209.300.7140

The advertisement features a background image of a person's hands holding a large quantity of almonds. The text is overlaid on this image in various colors and fonts. At the bottom, there is a dark blue banner with white text.



Make your next move
your best move.

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



/// Learn more at
LunaScalaGamePlan.com.



Orchard Tasks

(continued from page 12)

has been depleted. You don't have to wait until every last petal has fallen.

Nurseries will start digging trees in January. Bare-root trees should be ready for sale and tree planting should be well under way by the middle to end of January. When planting dormant trees, keep roots protected from the air as much as possible, for their small root hairs can dry out quickly. Planting in the fog provides the ideal conditions to keep root hairs moist and cool, while planting when it is sunny, cold, and windy can be detrimental. The planting hole should be large enough to receive roots without bending or crowding them to fit into the hole. Do not heavily prune roots, for roots store carbohydrates needed to support new growth. Only prune off damaged roots. You can help prevent possible crown gall infections by treating roots before planting with biological solutions that can reduce infections by crown gall bacterium.

One of the worst things that can happen to young bare root trees is that they are often planted too deep. Trees can be planted at the right height, but then a berm is often thrown up around the trees and their crown (the graft union between the scion and rootstock) is covered with soil. I have observed many trees killed by *Phytophthora* root and crown infections that were planted too deep –

many with their graft union below the soil line. When planting, trees should be placed high on small mounds and as shallow as possible.

Planting depth after settling should be no deeper than in the nursery, and the graft union should always be well above the soil line.

Every year I say this—like a broken record—and every year I find trees planted too deep. The hole should be deep enough so that roots are spread out and not cramped; the nursery soil line should be above the recently planted soil line; place the highest root a little above the soil line and then cover it with dirt; and allow for 3-6 inches of settling in the planting hole. I recommend adding a little bit of water (2-5 gallons) around the roots in order to remove air pockets and settle the soil. Some growers will pull trees up if they settle too much—but I would prefer to see the tree planted high initially. I have never seen trees die from being planted too high, but I have seen many die from being planted too low. Be careful when planting into heavy soils that drain poorly and have slow water

Winter Sanitation Services

• PISTACHIOS • ALMONDS •

Mummy Pulverizing w/ Rears mummy mower
set up with sweeper brushes and blower

Affordable and Competitive Pricing

Don't let NOW take over your orchard. Call now!



VALLEY CUSTOM



HARVESTING

- Keep NOW under control
- Pulverize almond and pistachio mummies
- Shaking and mowing package deals
- Taking contracts for 2020 Pistachio and Almond harvest or just shaking for Almonds.

Pinder 530-713-9645
Harvey 530-301-0213

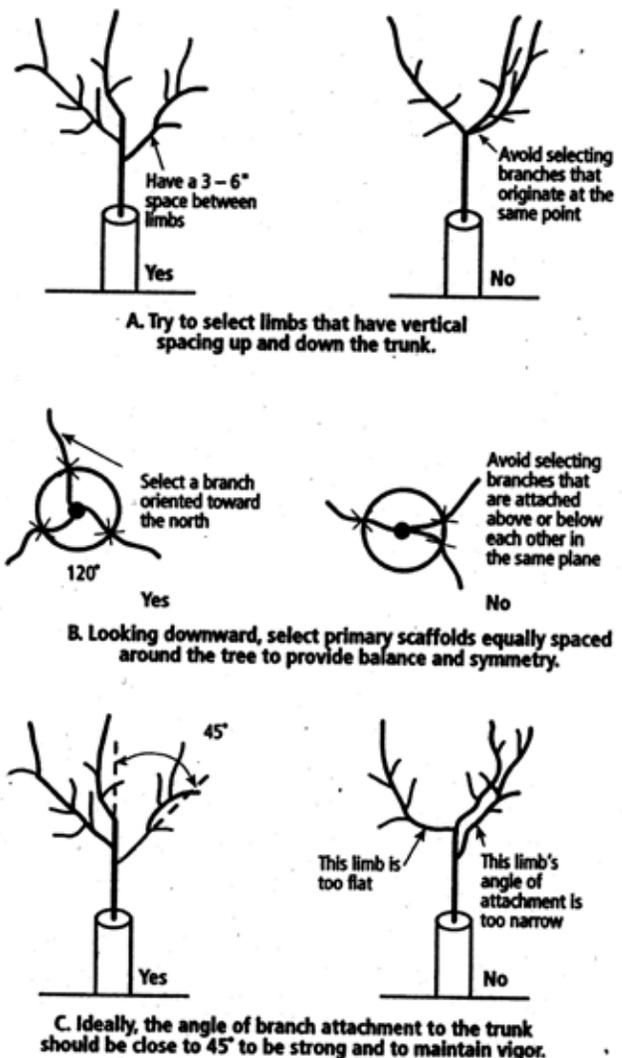


Figure 20.1 The three considerations in selecting primary scaffolds are limb spacing (A), orientation (B), and angle of attachment (C).

percolation. By planting high on the berm, excess water will drain away from the tree, reducing the length of time the crown is exposed to excess surface moisture.

Saturated soil conditions can occur at planting if trees are irrigated too heavily, or if winter and spring rainfall occurs. Some orchards survive years before a wet spring kills trees that settled too deep or had their crown covered with a berm. Plant the tree right the first time—high on a mound or berm. If you are planting with Marianna 2624 plum rootstock, you should plant your trees the same depth they were planted in the nursery, for this rootstock suckers easily when planted to high. Marianna 2624 is fairly resistant to Phytophthora and can also tolerate excess soil moisture better than other rootstocks.

Pruning at planting consists of heading the trees back to about 44 inches from the soil line. I have started leaving more space for primary scaffold development. There is usually no need to add nitrogen fertilizer when planting (except if you recycled your previous orchard and have a lot of wood chips). After shoots have pushed out a couple of inches in the spring, nitrogen and more water can be added, never add more than one ounce of actual nitrogen per tree at any one time the first year.

First season dormant pruning is the most important pruning your orchard will ever have, determining the tree's shape and performance for its lifetime! At this time you should select three to five (I used to just recommend three) permanent primary scaffolds that will form the framework of the tree. I have observed the consequence of first year trees pruned improperly: poor scaffold angles, shortened primary scaffold with multiple secondary, failure, crowding, and breaking of primary scaffolds, resulting in increased susceptibility to diseases,

resulting in early removal of orchards. The primary goal of the first dormant pruning is to select primary branches with as much space as possible between them. Wide spacing ensures the best chance of strong branch attachments that will not split or break as the tree matures. Try to have 3-6 inches of space vertically between primary limbs (Figure 20.1-A, UC Almond Production Manual, ANR # 3364). The three or more primary

scaffolds should be oriented 120 degrees apart (or proportionally distanced from each other if more than three primaries) when viewed from above (Figure 20.1-B). Such an arrangement reduces the chance of splitting branches, leaning trunks, and crossing limbs. If possible, one of the three primary scaffolds, preferably the strongest, should grow into the prevailing wind, usually the northwest. I prefer to

(continued on page 16)

MAXIMUM SWEEPING EFFICIENCY

The **ALL-NEW E-1160** Sweeper is designed to minimize dust for maximum harvesting efficiency.



Built by farmers for farmers... we understand!

For more information about our products, please visit www.exactcorp.com or call 209.544.8600

Exact[®]
Harvesting Systems

Orchard Tasks

(continued from page 15)

have a second primary growing towards the northeast. Two or more strong, vigorous limbs on the north side help balance the tree from being dominated by the growth of one primary on the 'sunny' south side of the tree.

Pruners should also pay attention to the angle of the primary limbs when selecting them; for the scaffold angle determines whether bark will become embedded between limb and trunk. The ideal primary scaffold grows 45 degrees from the vertical and the horizontal. If the ideal limb is not present, try to find limbs at least 30 degrees from the vertical or at least 30 degrees from the horizontal. Limbs that grow at too flat of an angle tend to lose their vigor and upright orientation. Limbs where the bark becomes embedded will be weak and prone to split with the heavy crops.

We used to recommend three primary scaffolds because if trees got too big to trunk shake we could limb shake them. But most of our new higher density orchards will never be limb shaken. Roger Duncan, UCCE Advisor in Stanislaus County, has found in his tree density and pruning trials that the number of primary limbs is less important if they have proper scaffold angles and spacing, especially in higher density plantings where trees will most likely never get so big that they need to be limb shaken.

After the primary scaffolds have been selected, the next step is to remove all other major limbs that originate from the trunk, and all growth below the lowest primary limb. There should be at least 22 inches from the first primary scaffold and the ground to allow space for the shaker head. Pruners should leave small lateral branches on the primaries; this growth promotes

scaffold caliper growth and is the first to develop spurs and produce nuts. Growers can prune their primary scaffolds differently using three different pruning practices: short pruning, long pruning, and intermediate pruning.

These practices generally do not affect trunk diameter or limb caliper, but production differences related to tree pruning occur with the first few harvests but gradually disappear after trees mature. Generally speaking, I recommend Long Pruning, for we have found that it generally results in greater earlier production. The grower should also consider the growth habit of the variety they are pruning and the wind conditions present in their specific orchard location. I usually prefer a 'happy medium'—intermediate to long pruning.

Long Pruning

Growers who use long pruning make no major heading cuts on primary scaffolds and retain small lateral branches that will provide leaf surface and early fruiting. This type of pruning allows the tree to develop a natural branching habit. Scaffolds, canopy, and fruitwood develop quickly. Long-pruned trees usually need roping or tying (**Figure 20.2-B, Almond production manual**). If ropes are used, they must be placed as high on the primary scaffolds as possible so that the scaffolds do not bend over and break. In this system, secondary and tertiary branches are selected from the natural branching of the tree. The main advantage of long pruning is heavy early production. Disadvantages include the need for more work and care the second growing season. Willow growing varieties such as Monterey may be unsuitable for this system of training, and usually should be tied.

Short Pruning

This type of pruning involves

(continued on page 18)

FIRMAN
Pollen
Co., Inc.
Setting the standard in pollen application since 1933

Leading the industry in commercial pollination of nut and tree fruit crops. Committed to high-quality pollen, purity, viability, and certainty of pollen alleles.

Beehive Inserts

Scummy Pollen Puffer

Precision Pollination System™

Contact us today to see how we can serve your operation.

Firman Pollen
509-452-8063 | 800-322-8852
FirmanPollen.com
301 N 1st Avenue | Yakima, WA 98902

CERTIFIED PREMIUM
FP

f in

Storm, I'm ready for you



Fontelis[®]

FUNGICIDE

When cloudy, grey skies appear during bloom, DuPont™ Fontelis® fungicide will help protect your almond trees. Fontelis controls key early-season diseases like brown rot blossom blight, Anthracnose, jacket rot and shothole. The single active ingredient (FRAC Group 7) gives you the flexibility to rotate, or tank mix, with other modes of action. With Fontelis, you and your trees are ready.

Orchard Tasks

(continued from page 16)

heading each of the three primaries back to 18-24 inches. Unfortunately, I have seen some pruners even head their primaries back to 12 inches or less – which is much too severe and will lead to “elbow” growths and sharp secondary angle branching. Short pruning (18-24 inches) stimulates vigorous secondary growth that is largely removed later with thinning cuts. This type of pruning allows growers a large role in shaping trees, because the vigorous regrowth provides many choices for secondary limb selection where you want it. Short-pruned trees are usually shorter in stature and require less roping or tying their third leaf. Keeping trees shorter may be advantageous to their second growing season in areas with strong wind. Although short pruning is easy to teach, growers should consider the trade-offs. Heading

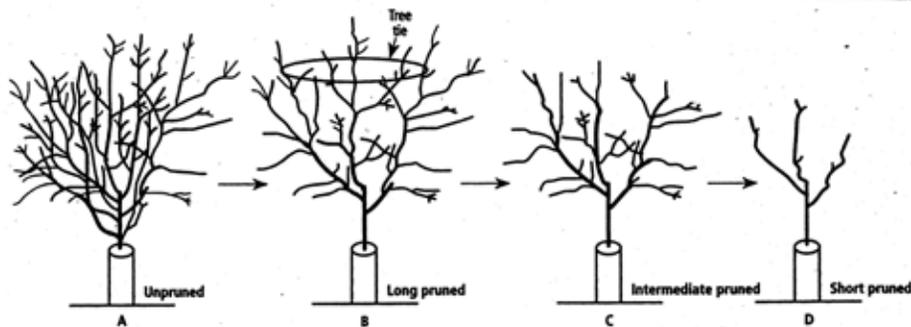


Figure 20.2 The same tree (A) before pruning and after first dormant pruning according to different training systems: (B) long pruning, (C) intermediate pruning, and (D) short pruning.

cuts on vigorous trees can encourage vegetative growth at the expense of early nut production and increased pruning expenses.

Intermediate Pruning

Intermediate pruning (my favorite) is a compromise between short and long pruning. Growers make heading cuts high on the primary scaffolds. These cuts are at 42-48 inches from the trunk, usually at a point just below the closely spaced buds that are common in the last 6 to 12 inches of shoot

growth. Heading at this distance greatly reduces the number of new shoots that originate near the end of the branch in the second leaf. This reduces the shoot weight at the end of the primary scaffold and makes it less likely to bend in spring winds. As with long pruning, intermediate pruning will keep small lateral branches to increase leaf surface and promote early fruiting. Intermediate pruning generates less undesirable water sprouts than short pruning. If intermediate pruned trees are especially vigorous or if the variety is willowy, branches may require roping prior to the second leaf. Overall, this is a successful training system that avoids the worst problems of long pruning but offers advantages in terms of early production.

Minimal Pruning

Interest in minimal pruning has increased greatly and deservedly. To quote Roger Duncan, “there are a lot of reasons to prune, but increasing yield is not one of them!” All of our UC pruning studies have shown that pruning reduces yield. I believe my family severely overpruned our first almond orchard, resulting in lost production, because we were ex-Cling Peach growers converting to almond production and pruning had been our main method of crop thinning for size. But with almond, thinning for crop size is not necessary, and minimal pruning should start with the second growing season, after primary limbs have been properly selected. At

Best Rootstock for Heavy & Wet Soils

Krymsk[®] 86

Almond Rootstock (cv.AP 1) USPP#16,272

- Nonpareil Compatible
- Tree Size Similar to Nemaguard & Lovell
- Tolerates Heavy Soil
- Good Nut Size

Available At These Fine Nurseries

Fowler Nurseries, Inc.
1-800-675-6075

DUARTE TREES & VINES
1-800-472-3833

Bright's Nursery
1-209-389-4511

Sierra Gold Nurseries
1-800-243-4653

info@p2g.us.com

this point growers can back off on pruning and concentrate on early production. Usually by the second dormant season, the secondary branches do not need to be headed unless excessively long, since most almond trees branch sufficiently without heading cuts.

Other than pruning out limbs that compete with our selected primary scaffolds, and removing badly crossing branches or limbs that interfere with mechanical cultivation, additional limb removal is usually unnecessary. For young trees between 3-7 years old it is generally a good idea to tie the canopy in order to support limbs and prevent breakage. With some varieties, like Monterey, it is critical to tie or primary limbs could be lost. It is difficult to judge next year's crop load when pruning and circle tying in the dormant season. Better safe than sorry.

Weeds have a tremendous capacity to spread within your orchard. The first line of defense is identifying the weeds you need to control, and selecting the best herbicides or cultural practices to control those weeds. If you use the same herbicide(s) each year, some tolerant weed species may dominate the orchard floor. The UCIPM website has charts that show which weeds are controlled by what herbicides, and an excellent weed photo gallery that includes many weed species commonly found in California for easy identification and reference <http://www.ipm.ucdavis.edu/>.

Navel Orangeworm (NOW) is the most damaging insect pest of almond, and the main contributor to the reject levels associated with nut quality. For years we have recommended that overwintering mummies be reduced to two mummies or less per tree. Brad Higbee, Paramount Farming, and Dr. Joe Siegel, USDA-ARS Parlier, have developed data that supports

reducing this threshold down to 0.2 mummies per tree, and reducing mummies found on the ground to less than 4 per tree. Winter mummies should not only be knocked out of the tree, they should be destroyed on the ground. Data also suggests that hard shell varieties should be sanitized too, for NOW populations can build up while feeding on hard shell hulls, and that mating disruption will also play an important role in NOW control in the future.

Good Luck and Happy New Year!

Pecans

In January, if the harvest has gone well, there will be a transition of gathering the crop and getting it sold, then to pruning the trees. Mechanical pruning is the most common way to get the job



(continued on page 20)

FLORY

LEADING THE WAY IN NEW TECHNOLOGY
PRESENTING THE **MULTI-PURPOSE...**

FLORY ST14 SHUTTLE TRUK

Standard features include...

- Next generation air-cab with 180° swivel seat
- Updated controls and operator comfort
- 1/2" Shatter resistant orchard glass
- Service brake for quick powerful stopping
- Cruise control for consistent ground speed
- LED headlights and tail lights with high-low beam for improved road safety
- Easy engine and DEF access
- Rubber isolated cooling package with reversing hydraulic fan
- Service friendly

YEAR ROUND USES

Air-O-Fan Sprayer

Flat Bed

Nelson Hardie Sprayer

Herbicide Sprayer

TRADITION - INTEGRITY - SERVICE - CRAFTSMANSHIP
Since 1936

Flory Industries, Salida, CA 95368 USA 209.545.1167
See all our products at goflory.com

Watch the video on ShuttleTruk.com

goflory.com Call Your Local Dealer Today!

Orchard Tasks

(continued from page 19)

done in orchards.

In the past, you would sometimes see growers getting more light penetration in the orchards by thinning orchards out by removing trees. This is not something that we would recommend anymore in orchards. There may be particular cases where there would be some need for thinning orchards. For most orchards, we would generally recommend a three to five-year pruning cycle. Some orchards may require some pruning intervals shorter than others. The reason for the differences in pruning cycles has to do with the vigor of the orchards.

Some orchards are in areas conducive to high-vigor vegetative growth. Other factors contributing to vigor is pecan variety. One example is the Pawnee variety, as it tends to have longer, more vigorous vegetative growth than different



Richard Heerema is the Extension Pecan Specialist at New Mexico State University, Las Cruces.

varieties we are used to.

The first mechanical topping in the orchard should be in years 8 to 10. As the trees are approaching their ultimate height, you should do a light cut on that first pruning. If you wait until the tree is much past its ultimate height, you may have to cut a lot of wood off in that first pruning pass, and the tree will typically respond with vigorous re-growth –which is something growers should try to avoid, as it is counterproductive. Big, aggressive pruning cuts also have more of an adverse effect on yield the following year than light pruning does.

How often you prune may also

depend on how closely the trees are planted. In densely planted orchards, it will likely be a shorter interval than if you have wider spacing.

With mechanical pruning, many growers ask at what height should they top the trees. The ultimate height may be 25 to 35 feet, and you want to do that first pruning before it reaches that height. A good rule of thumb is that the height of the tree should be no taller than the distance of the trees within the rows. Rows with 40-foot spacing, for example, allow for taller trees than rows with a 25-foot spacing.

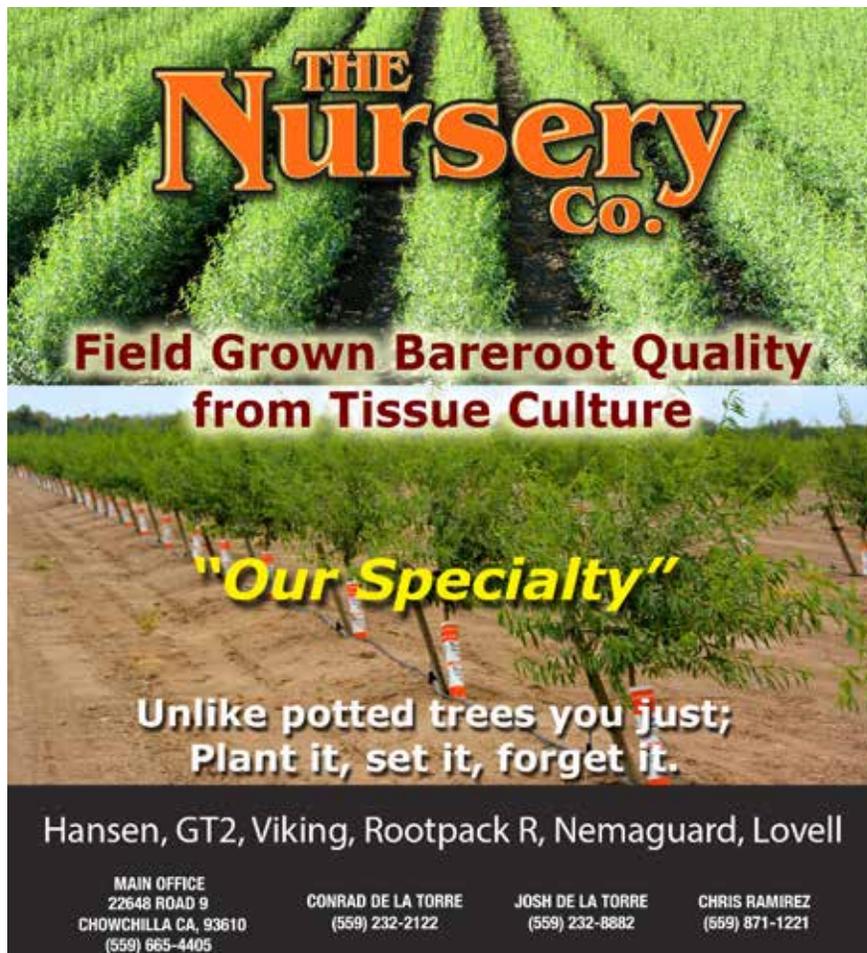
Ideally, the rows will run in a north-south direction, and that would be the direction of the mechanical pruning machine. That gives the greatest benefit to the tree. That doesn't mean you should not prune in the east and west direction. It's that pruning in the north and south direction has a more significant impact than the east and west direction. If, for some reason, an orchard is planted east and west and it is on flat ground without a berm, then pruning north-south is still the best option.

Pruning the top of the tree to a housetop configuration is very common. But I do not have any data showing that it is a better system than others. However, it does seem to work very well.

As a reminder, you want to give the trees a light "haircut" instead of very deep cuts during pruning practices; however, if an orchard has been neglected for a long time, then you may need to make deeper cuts. In this case, it could be the right choice.

Another aspect of pruning is that a lot of producers will shred the brush and incorporate them back into the soil. I would argue that this is a very good practice in part because it introduces organic matter back into the soil. But I also want producers to realize that the

(continued on page 22)



THE Nursery Co.

Field Grown Bareroot Quality from Tissue Culture

"Our Specialty"

Unlike potted trees you just; Plant it, set it, forget it.

Hansen, GT2, Viking, Rootpack R, Nemaguard, Lovell

MAIN OFFICE 22648 ROAD 9 CHOWCHILLA CA, 93610 (559) 665-4405	CONRAD DE LA TORRE (559) 232-2122	JOSH DE LA TORRE (559) 232-8882	CHRIS RAMIREZ (569) 871-1221
---	--------------------------------------	------------------------------------	---------------------------------



Alion®

Weeds are thieves.
Time to put 'em away.

/// End weed theft from the start. And six months from now. Trust long-lasting Alion®, the foundational herbicide, to give your trees and vines the healthy start they need.

Find out what Alion can do for you at AlionEndsWeeds.com.

Orchard Tasks

(continued from page 20)

carbon to nitrogen ratio is high for the shredded prunings.

One thing to keep in mind if you are incorporating the shredded prunings back into the soil is that you may need to increase your nitrogen application rate during the first three cycles of applications. This is because the microbes feeding on the shreds are taking nitrogen from the soil. Over time, the nitrogen in the soil will be available to the tree, but over the short-term, the nitrogen is unavailable, being consumed by the microbes.

The Pecan Tasks are based on an interview with Richard Heerema.

Pistachios

By Bob Beede

Chilling & Cold

Weather Update

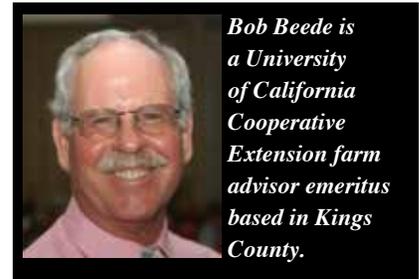
As you know, November was dry



and warm, which allowed for completion of lots of fieldwork, but at the expense of early rainfall and chill accumulation. The dry, warm November prompted questions about applying Rest enhancement foliar treatments early, the details of which were covered in considerable detail in last month's Task List. Since then, we have been blessed with considerable rainfall and cold weather to put our minds at ease. Although the reservoirs are above their historic average in most locations, we need that pure water from the heavens badly, for many reasons. One of the main ones known to all is the woefully deficient storage capacity for an ever-growing population; we simply do not have much wiggle room these days when it comes to water supply. So, stay on your knees, my friends, in hope that this winter will continue to provide an abundance of rain and cold weather for chilling.

Table 1 on page 26 provides the chill portions for various sites throughout the Valley between September 1 and December 10 for the past six winters, as well as 2010 in which over 70 chill portions were accumulated by February 15. This exceeds the 58-60 chill portions estimated to satisfy the rest requirement of the Kerman cultivar. The Peters male may have a chill portion requirement as great as 65. The values in parentheses are the total chill portions accumulated by station and year, up to February 15. My study of the chill accumulation patterns the past few years suggests there have been more cold weather events after the traditional cut-off date than usual. Hence, trees with high Rest requirements like pistachio and walnut probably benefit from chill portions accumulated up to March 1, and possibly even March 15.

Last year at this time, I declared my personal sense of ignorance about the physiology of deciduous



Bob Beede is a University of California Cooperative Extension farm advisor emeritus based in Kings County.

tree rest. I have read several papers on the subject since then, and must admit that my comprehension has not improved much; the papers address lots of hypotheses and results of monitoring concentrations of growth substances, but we still really don't know the exact mechanism of chilling, and to what degree it can be manipulated.

So, if I were going to write the book, "Pistachios for Dummies", I would simply state the obvious; deciduous fruit trees not receiving "Adequate Rest" struggle to leaf out and bloom, and produce less crop presumably because they are depleted in carbohydrates. They also develop leaf area for carbohydrate replenishment slowly, and have weak or poorly overlapping bloom, which does not set enough fruit. There are scientists who can wax on eloquently about the physiology, but it will not change the fact that adequate chill portions are needed to prevent pistachio trees from waking up like grumpy bears!

Over the years, Rest researchers generally agree on the following: (1) it is the bud temperature that concerns us. Light, wind, fog, and shade all affect bud temperature. Clear, sunny days can elevate bud temperatures 100F above the air temperature. Wind also warms buds slightly above ambient temperature. Fog and shade make the bud temperature equal to ambient. (2) Rest satisfaction begins in the fall when the terminal buds are no longer active, and the leaves no longer functional. (3) December and January are believed to be the two most important months for

(continued on page 24)

Tree Protectors

Essential for all newly planted trees!

Promotes growth.

Protects against rodents, herbicides, sunburn, and frost.

Do they work?
Field-tested for over 45 years!
We think so.

Lock-On, Staple-On, and Drop-On styles

Contact us at
1-800-241-3513
or **(714) 547-9266**
www.pacificwestern.com

PACIFIC WESTERN
CONTAINERS
Santa Ana, California

Vine Protectors and other specialty agricultural products available



WILBUR-ELLIS
AGRIBUSINESS

Right Products, Right Research, Smart Tools, Best People That's the Wilbur-Ellis Difference

Almond bloom is not only a critical time for bees and fungicide applications – it's also important to focus on nutrient decision making. Wilbur-Ellis' customized nutrition programs are tailored specifically to each orchard's needs, and every product in our portfolio is developed in tandem with extensive research. Our scouting tools help our growers make informed decisions, while our team of advisors, chemists, and nutritionists cover the rest, collaboratively increasing production with their years of combined expertise and knowledge.

Focused, Tailor-Made Nutrition

Wilbur-Ellis Nutrition products are made with a focus on enhancing overall yield. Each product decision is determined by orchard-specific needs through post-harvest hull samples and in-season tissue and soil samples. This ensures only specific and required nutrients, biostimulants and adjuvants are recommended.

Tested, Vetted and Proven

Wilbur-Ellis' portfolio of products are backed by an extensive library of multi-year replicated data and economic evaluations, delivering a positive performance and higher return on investment.



Making Decisions Easier Than Ever

AgVerdict® is Wilbur-Ellis' strategic decision-making toolkit, combining field-specific data with our agronomists' knowledge in order to maximize return on investment. AgVerdict's mapping, imagery, and scouting abilities track bloom through interactive analyses, including easy-to-use, comparable pictures of growth stages and maturity for each orchard. Leveraging this database provides more insight than ever into spray timings and disease susceptibility.



Our Team of Experts

At Wilbur-Ellis, we succeed when our growers succeed. We're proud of what we've assembled – a compilation of **multi-branch results- and information-sharing individuals**, going the extra mile to make sure we've done everything possible to **increase growers' crop knowledge and yield potential**. Plus, our local **boots-on-the-ground teams** are constantly out in the field, scouting and leveraging their **extensive knowledge** to keep our customers' crops in tip-top shape.

Through nutrition tailored to each individual orchard's needs, backed by extensive research, paired with an easy-to-use decision-making tool and topped off with our team's years of expertise, Wilbur-Ellis has demonstrated our interests are aligned with our growers'. For more information, or to start working with Wilbur-Ellis, contact a local Wilbur-Ellis representative or visit almonds.wilburellis.com today.



Terra Buena
1st Annual
Symposium for
Sustainable Agriculture
in the San Joaquin Valley

January 31, 2020
8:00am Registration
8:30am-4:00pm
International
Agri-Center



Dr. Elaine Ingham
Keynote Speaker

President and Founder,
Soil Foodweb, inc.



Come learn the
"Soil Foodweb Approach"
Featuring many of the
agricultural industry experts

Pre-Registration \$25
Door Registration \$35
Lunch will be provided
Register at

www.terraBuena.com

Orchard Tasks

(continued from page 22)

Rest satisfaction. (4) Deciduous trees with high vigor and nitrogen status in the fall have a higher Rest requirement than trees with moderate vigor and nitrogen level. (5) Researchers report in the literature that periods of "non-chilling" temperatures interspersed through the winter increases the plant's chilling requirement. The increase depends on the magnitude of the elevated temperatures, and their duration.

I have gone back and reviewed the chilling observations of Dr. Julian Crane, as well as the research Dr. Louise Ferguson and I performed individually and collectively. It all clearly states that Kerman and Peters do not grow normally when winter Rest is inadequate. Our research efforts suggest Kerman requires 750 hours below 450 F, and Peters 850 hours in order to leaf out and bloom promptly in the spring. One experiment suggested that Peters continued to benefit from cold temperatures up to 1200 hours below 450F.

It was also reported in these studies that a minimum of 500 hours below 450 F was needed to initiate much bud break from Peters. University of California Circular 179, "Deciduous Orchards in California Winters", by W.H. Chandler and D.S. Brown (1936), states that December and January are the two most critical months in California to satisfy the rest requirement. It was their belief that optimal Rest conditions occurred when each of these months received 400 hours below 450F. In recent years, we have been fortunate to get 200. During the 2013 and 2014 winters, the unusually warm temperatures in January did not provide its complement of chill hours.

Craig Kallsen, UC Farm Advisor for Pistachios and Subtropicals, Kern County, recently published a refereed journal paper summarizing thirty years of pistachio yield data from three Kerman/Peters orchards in Kern County. Armed with CIMIS weather data proximal to each orchard, Craig studied the relationships between yield the



previous year and a number of calendar periods including fall and winter temperatures preceding the next crop year. This data set showed a positive correlation between yield and hourly air temperatures greater than or equal to 450F and less than 600F.

The accumulation of chill portions or hours did not correlate as well with yield as the hours accumulated at temperatures between 45-600F. Modeling fall and winter air temperatures above 65 and bloom temperatures above 800F both resulted in negative correlations (reduced) with yield. This data makes me think there is a lot of pistachio physiology that I do not know, and hence my earlier statement that I question my knowledge about rest. Those interested in fully understanding Craig's study and entering your own data for yield prediction can do so at: <http://cekern.ucanr.edu/files/260681.pdf>.

The effect of high winter temperatures is thought to elevate the bud respiration rate, which consumes the limited amount of

stored carbohydrates critical for spring growth. UC Davis Plant Sciences Associate Professor Maciej Zwieniecki (Dr. Z) and his Research Associate, Anna Davidson, have joined our pistachio industry research team to study this important aspect of tree biology. Dr. Z suggests there may be a critical amount of carbohydrates and other growth substances needed to produce normal growth in the spring. This may explain why oiled trees performed so poorly in

2015. Oil is thought to enhance rest breaking by causing a slight stress to the tree, which is not phytotoxic. In the process of metabolizing the oil, the tree may increase its respiration rate, which renders it more responsive to favorable spring temperatures for growth. Thus, high January temperatures and oil treatment possibly have a compound effect on carbohydrate depletion from elevated respiration. When the time comes
(continued on page 26)



Complete Line of Quality Nut Harvesting Equipment



 Fewer Moving Parts

 Easy Maintenance

 High Resale

MORE HARVEST PROFIT
AT A LOWER COST

Self-Propelled Harvesters

P.T.O. Harvesters

Self-Propelled Air Cab Sweepers

Self-Propelled Sweepers

Tractor Mount Sweepers

P.T.O. Blowers



Weiss McNair

NUT HARVESTING EQUIPMENT

100 Loren Avenue, Chico, CA 95928
(530) 891-6214 Fax (530) 891-5905 www.weissmcnair.com

Orchard Tasks

(continued from page 25)

for bud break, the deficiencies in both chilling and available sugars create the perfect storm for poor leaf out and fruit set. There could also be detrimental effects to male and female flower development and receptivity.

To check on your local chilling, go to the “Weather-Related Models and Services” section of the UC Fruits and Nuts Center. Select “chilling accumulation models” from the menu, and then “Cumulative Chilling Portions”. This site allows you to see the chill portion accumulation for every CIMIS station in the state. You can also click on a given station to get historical data. I find this helpful in estimating where we are relative to other years. You can also compare chill portions to chill hours at this webpage. Keep in mind that these stations were designed to accurately estimate water use, not chill accumulation. The data is collected in an open grass-covered area, which may influence the temperatures compared to those within the orchard environment. The absence of fog also causes temperature differences up to 200F



between ambient (air) and the buds. Obviously, we are concerned with the bud temperatures, so it would be helpful to make note of those warm, fog-less winter days. Lest I miss yet another opportunity to stress the importance of having your own weather station, I want to point out that relying upon CIMIS stations can be very misleading, especially if you are farming in an area with lots of rolling terrain, such as Coalinga. Make it your New Year’s resolution.

Field reports indicate some growers began rest enhancement treatments in early December as a precaution. The use rates of the various kaolin-clay products vary from 25 to 40 pounds per acre. The liquid calcium carbonate is typically applied at four gallons per acre. Re-application is recommended after

significant rainfall. Applications are not presently advised in February, unless one desires to delay bud break and bloom due to the risk of spring frost in your growing area. The cost per application is estimated at \$80-90 per acre.

Snow? Bring It On!

Growers wishing to periodically check on reservoir and snowpack status can do so at my website: http://cekings.ucanr.edu/Agriculture/Grapes_Tree_Fruits_Nut_Crops/. Select “Management” in the main menu, then “Water and Weather”. Select “Snowpack Status” from the menu, which will link you to the state water resources webpage. This page converts snowpack into water content and plots it for three major sections of the state. It also compares this year to wet and dry seasons and the 30-year average. These plots really provide a visual picture of where we stand in water availability. Statewide reservoir conditions can be accessed by selecting “Reservoirs Status” from my webpage menu. This takes you to a DWR web site that lets you click on the reservoir of interest. It then brings up information about current and historic water status, and allows you to select what years you would like to compare in graphic form. It is pretty neat, and gives you lots of sound data to spread around at the coffee shop.

Happy New Year farming, and see you at Pistachio Day, Wednesday, January 22, 2020, at the Visalia Convention Center! PNP

Year	2019-20	2018-19	2017-18	2016-17	2015-16	2014-15	2013-14	2010-11
Durham	16	27(69)	21(62)	23(64)	25 (66)	22 (55)	20 (54)	28 (70)
Patterson	na	na	19(na)	16(54)	20 (59)	23 (63)	22 (63)	26 (73)
Madera II	na	na	20(na)	22(68)	25 (66)	25 (52)	15 (57)	23 (na)
Parlier	16	21(61)	16(52)	14(56)	26 (67)	27 (64)	22 (53)	27 (74)
Five Points	15	21(59)	15(52)	15(56)	24 (65)	15 (52)	20 (55)	24 (69)
Coalinga	13	21(59)	14(50)	16(60)	25 (62)	13 (48)	20 (53)	28 (70)
Shafter	14	22(56)	17(51)	12(49)	24 (59)	25 (61)	24 (63)	23 (70)
Delano	16	20(55)	na	15(56)	25 (65)	16 (58)	22 (56)	24 (73)
Blackwell’s	18	21(62)	16(58)	18(60)	24 (67)	15 (52)	21 (50)	27 (75)
Arvin/Edison	13	19(54)	13(48)	15(54)	23 (61)	10 (44)	21 (55)	22 (66)
Porterville	18	24(68)	16(na)	14(49)	30 (76)	20 (63)	22 (59)	27 (63)

Table 1. Chill portion accumulation for various CIMIS stations statewide from 9/1-12/10 for selected years.

Numbers in parentheses are the total chill portions accumulated at each station by year from 9/1- 2/15.



POWERFUL MARKETING DRIVES POWERFUL SALES

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

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



An Industry Working Together.

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



Ensuring a Healthy & Nutritious Crop

California Almond Growers Put Quality & Safety First

By Theresa Oliveira Drumonde, North Valley Correspondent



The speakers left to right: Howard Sklamberg (Akin Gump LLC), Tim Birmingham (Almond Board of California), Elizabeth Fawell (Hogan Lovells), Franck Benachour (Steripure), Dr. Marc Allard (FDA), Brian Dunning (Chairman, ABC's Almond Quality and Food Safety Committee), Dr. Linda Harris (University of California, Davis), Dr. Chris Simmons (University of California, Davis), Dr. Themis Michailides (UCCE), Darren Williams (Almond Board of California).

Consumers can rest assured that much planning goes into providing the safe California almonds they purchase at stores worldwide. Growers and processors of California almonds take special care to provide not only a healthy and nutritious snack, but a safe one as well.

California growers and processors go to great lengths to ensure the quality and safety of the almond crop. To assist growers and processors with this enormous deed, each year, the Almond Board of California hosts an annual Food Quality and Safety Symposium. The one-day event focuses on progresses in food safety technology. The topics covered this past year, ranged from off-ground harvest of almonds to food safety across the supply chain.

Christopher Simmons with the Department of Food Sciences and Technology at UC Davis presented an Off-Ground Harvest of Almonds: Preliminary Technoeconomic Cost and Benefit Analysis with

Analysis of Barriers to Adoption. His presentation covered the benefits of off-ground harvest as well as the costs. "The goals are to understand the economic opportunities and risks associated with potential off-ground harvesting approaches compared to conventional methods," explained Simmons.

Simmons noted that the industry is used to harvesting the conventional way and that all cost drivers must be analyzed to fully understand the benefits. With off-ground harvesting, three methods of drying are being analyzed. First, in-orchard windrow drying must be analyzed for quality assurance and efficiency. The second method Simmons shared was lot drying. He said the efficiency of this method would also rely on the availability of locations for lot drying. The third method analyzed was mechanical drying. For this method, dryer format and cost as well as increased hauling cost need to be considered.

Overall, Simmons said that

change in net return above total costs is what growers need to consider when deciding what method is best for their operation. Some expected effects, as he explained, could be losses due to windfall, which can be affected by region, variety and harvest schedule. Simmons stated that harvester effects are currently unknown, but that rental cost will be affected by capital cost, fuel and labor demand, lifespan of equipment and depreciation and finally maintenance cost of equipment.

As for cultural practices surrounding off-ground almond harvest, fewer pest control measures are needed and less stringent leveling of the ground is needed according to Simmons. These factors are especially important if an orchard is located near town or a public facility. Harvest operations with this method would also avoid blowing and sweeping and pickup may be avoided entirely. This would eliminate public concern over dust during harvest. Simmons stated that more research and analysis is needed, but this could be a positive change for the industry.

Despite taking many measures

to ensure that their crop is harvested in a safe manner, growers have no control over what happens to their product once it leaves their farm. This is where GenomeTrakr database and network comes into play. Marc Allard, Ph.D., with the Center for Food Safety and Applied Nutrition at the US Food and Drug Administration, highlighted the importance of GenomeTrakr technology.

“The purpose is to track and trace food pathogens,” stated Allard. “This affects the global food supply.” He went on to say that there is insufficient resolution of current tools being used. There is the need to match clinical pathogens with environmental factors and improve the environmental database overall. Allard explained the need to develop a WGS based network to track real-time pathogen identification. This would allow faster identification of food involved in potential pathogen outbreaks, such as a salmonella

outbreak in chicken or E. coli found in spinach. A WGS network would also help track facilities and import lines that food has crossed. It would track global travel of products and ensure a safer global food supply. Allard noted the scope of the GenomeTrakr Network currently includes labs at the FDA, CDC, FSIS, 17 state health and university labs, one U.S. hospital lab, and 11 labs outside of the U.S. There are also contributing labs on four continents and in 10 countries. This growing network is yet another assurance of the safety of California Almonds for consumers worldwide.

That safety starts in the orchard, as Dr. Themis Michailides with the Department of Plant Pathology, UC Davis, and the Kearney Agricultural Research and Extension Center, explained in his presentation. “The almond industry has taken extensive measures and supports pre- and post-harvest research to control of aflatoxins and to assume compliance

with aflatoxin regulations,” said Michailides. He stated that it begins in the field with orchard practices. One way that growers can reduce the incidence of aflatoxin in an orchard is to remove mummies after harvest. Leaving mummies on the trees creates an environment for aflatoxin to grow.

Another major risk factor is nuts touching the ground while the soil is wet. Branches heavy with nuts can sometimes bend and touch the soil leading to potential problems. Once nuts are shaken, if they lay on damp ground, this poses another risk factor for aflatoxin. Michailides stated the approval of AF36 atoxigenic biopesticide use in almonds two years ago has given growers another tool to use against aflatoxin.

While potential risks from disease pathogens and pests are among the daily concerns of almond growers, there is also the potential risk of intentional adulteration of the

(continued on page 30)

OMC
Strong on parts and service

ORCHARD MACHINERY CORPORATION
www.shakermaker.com

Shockwave Sprint

Aftershock AR-400

Shockwave Monoboam

Aftershock CC-350

Aftershock SD-36

Yuba City 2700 Colusa Hwy Yuba City, CA 530-673-2822	Chico 2384 Dayton Rd Chico, CA 530-892-2822	Modesto 4207 E. Ceres Rd Ceres, CA 209-669-2522	Firebaugh 1529 N Street, Ste B Firebaugh, CA 559-659-0200	Tulare 5200 Tex Dr Tulare, CA 559-688-2081	Shafter 30715 San Diego St. Shafter, CA 661-746-7232
---	--	--	--	---	---

Follow us!
@OMCshakermaker

Almond Quality

(continued from page 29)

food supply. Unfortunately, in this day and age with technology at our fingertips, it is easy to imagine how someone or an organization could cause great harm to the food supply as we know it. For this reason, measures must be taken to assure consumers on a worldwide scale the safety of the food products the U.S. exports and imports. Elizabeth Fawell of Hogan Lovells provided an in-depth overview of the intentional adulteration rule, FSMA and FDA's final rule on mitigation strategies to protect food against intentional adulteration. The purpose being to protect food from intentional acts of adulteration where there is an intent to cause wide scale public health harm.

First, processing facilities and handlers should have food defense monitoring in place. Facilities that manufacture, process, pack or hold



food for human consumption need to create a food defense plan to assess their vulnerability. Once a food defense plan is in place, it should be revisited periodically to ensure it is sound. Employees need to be

properly trained and every aspect of the plan needs to be documented. Large facilities had to have a plan in place by July 26, 2019. Small businesses employing fewer than 500 full-time employees have to have a food defense plan in place by July 27, 2020. Very small businesses earning under \$10 million a year, have to have a food defense plan in place by July 26, 2021.

Franck Benachour, Chemical Engineer, NJIT and head of business development for Steripure, presented the EU Climate on Salmonella in Nuts. The leading EU countries for U.S. nuts imports and consumption are Germany, Netherlands, Belgium, Italy, Spain, France and the United Kingdom. One of the EU trends with almonds, as Benachour noted, is the increase in the need for almond flour. With an increase in vegan diets and gluten and grain free diets, bakeries are filling this need with almond flour. Lactose intolerance and a longer shelf life has also become a driving force for the increase in almond milk consumption internationally. A growing demand for peanut butter substitutes has also increased the demand for almond butter.

(continued on page 32)

WELDCRAFT

*Harvesting Equipment
For Fruits & Nuts*

Over 40 Years



Continuous Flow Receiver



Bin Carrier

Strip Sprayer

- Cat C3.4 tier 4 final turbo diesel
- WCI spray control system
- "New" full touch screen display
- Below industry avg. height - Only 5'



25' Pruning Tower

- Cat C1.1 tier 3 diesel engine
- Durable, Smooth, Better Flotation, Stability and Easy Towability



Rear Engine Bankout

Visit us at www.weldcraftindustries.com



Sun Valley, Inc.
(575) 267-4839



N&S Tractor
(209) 564-6251



QUINN



Quinn Cat
(559) 896-4040



Marsa
(693) 472-21-31



MOVENTO[®]



FORTIFIED

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

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

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

Almond Quality

(continued from page 30)

With an increase in demand in the EU, special care is taken so that consumer perception of quality is accurate, because a flaw in quality and perception affects brand recognition and loyalty. Salmonella outbreaks would only increase the risk of litigation from consumers or third party organizations if contaminated products led to illness or death. Benachour explained how detrimental a salmonella outbreak would be for the U.S. almond industry. For this reason, packers must take every step to reduce the risk for cross contamination. Poor manufacturing or packing practices can contaminate product that has already been pasteurized. “Ideally pasteurization and packing in sealed Kraft bags should occur at the same site to reduce risk,” said Benachour. He stressed that low detection capabilities for the presence of salmonella could increase the cost of distribution for manufacturers due to quarantine of shipments and the need to reprocess contaminated lots. For these reasons, packers and shippers of nuts should work closely with an EU service provider to help reduce potential losses. There is also a growing trend for pasteurization in Europe among EU retailers and processors.

Howard R. Sklamberg, from Akin Gump Strauss Hauer &

Field LLP gave an overview of FDA’s inspection practices for food handling and processing facilities. He discussed best practices before an inspection and after an inspection. Sklamberg reminded that the FDA is responsible for ensuring the safety of almost all food products sold in the United States. He reminded that FDA inspections are intended to protect consumers from unsafe foods.

He explained that Consumer Safety Officers or investigators in FDA’s Office of Regulatory Affairs along with state regulatory authorities conduct inspections in facilities to ensure food safety. An FDA inspection for growers, hullers, shellers and processors involve evaluation of manufacturing practices to preventative measures. Sklamberg noted that inspections are not necessarily announced and can take place over several days. “The goal is to ensure consumer safety and trust,” said Sklamberg.

Dr. Linda Harris with the Department of Food Science and Technology at the University of California, Davis, spoke about food safety across the supply chain. She agreed with what others said about food safety beginning in the field. She discussed studies done on foodborne outbreaks linked to U.S. grown tree nuts since 2001. Harris discussed the 2001 Salmonella Enteritidis Phage Type 30 (SEPT30)

outbreak. She explained that 15 of 32 150-acre orchards tested positive for SEPT30 within 10 square miles. The outbreak led to a risk assessment, which helped the Almond Board to set and implement a mandatory treatment process, a 4-log reduction of Salmonella in almonds.

According to Harris, continued studies have led to the hypothesis: Contamination source evidence suggests under normal circumstances, contamination on the farm is based on four factors. The first factor is environmental. The second is sporadic and the third is random. The last and fourth factor of salmonella on the farm is that it is found in low levels. Harris stated that keeping traffic control of both personnel and equipment is necessary to reduce contamination. Dust control is also an important factor she discussed. Water control—keeping almonds away from damp surfaces is a good preventative measure. Separation of raw and pasteurized products is also crucial, as well as effective cleaning and sanitation of equipment. In the end, there are many factors that contribute to the safety of our food supply. “Everyone plays a role in food safety,” said Harris. Consumers can rest assured that the California Almond Industry is doing all it can to provide a healthy, nutritious product, and most of all a safe one.

PNP

THOMAS

MANUFACTURING CO., L.L.C.

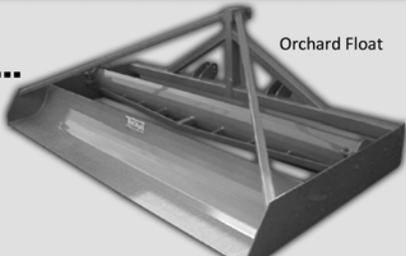
Ashphalt Float



Setting high industry standards since 1970...

Contact John Ray,
Manufacturing Sales Rep.
530-720-2388 • JohnRay@ThomasWelding.com

Orchard Float



*Providing Growers with
Innovative, Reliable,
High-Quality Harvest Equipment*

Visit us at www.ThomasWelding.com

Phone: 530-893-8940 | Fax: 530-893-2946 | Email: info@thomaswelding.com

Antles^{BRAND}

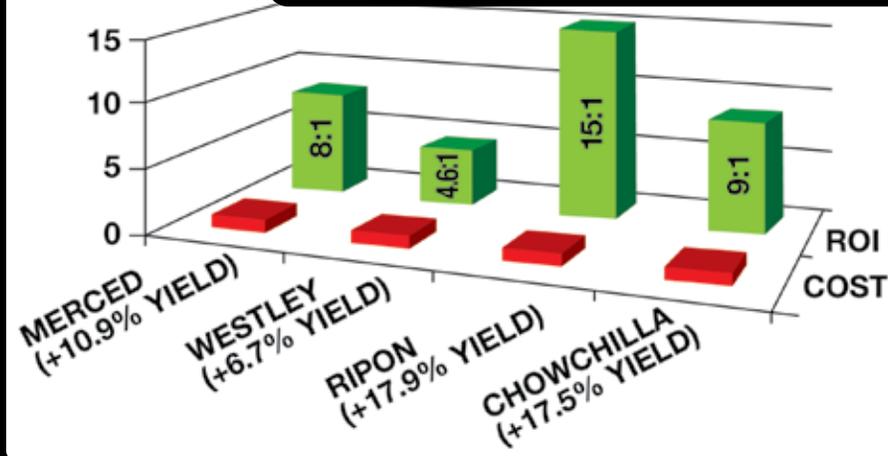
EST. 1929



Pollination Enhancement For Almonds

2014 - 2015 Field Trials Demonstrate Great

R.O.I.
RETURN ON INVESTMENT



Featuring Vericet Gold!

** Also ask us about our Pistachio Trials!*



MODESTO • WENATCHEE • YAKIMA

FOR MORE INFO CONTACT: BRIAN: 425-466-5631 DAVID: 209-595-2056 DON: 209-531-6895

***Toll free: Antles Pollen at 855-POLLEN8, Antles Pollen P.O. Box 577080 Modesto, CA 95357**

VERICET, THE VERICET 'V' AND VERICET GOLD ARE REGISTERED TRADEMARKS

Meet L. J. Grauke

Behind the Scenes Pecan Breeder

By Patrick Cavanaugh, Editor

L.J. Grauke is an essential person in the pecan industry; but many in the industry have not heard of him.

Grauke is the Research Horticulturist and Curator of the USDA National Collection of Genetic Resources for Pecans and Hickories, and he is also the horticulturist in the Pecan Breeding Program based at College Station Texas, home of Texas A&M University's main campus. He spoke recently at the Arizona Pecan Growers annual meeting in Tucson.

How he got started in the industry was serendipitous in that he came to Texas A&M in 1974 to get a Masters in vegetable breeding and



LJ Grauke is the Research Horticulturist and Curator of the USDA National Collection of Genetic Resources for Pecans & Hickories.

then joined the Peace Corp; however, looking for a place to live, he found a garage apartment, that was owned

by Fred Bryson, who was at the time the Grand Dean of Pecans at Texas A&M. "I paid \$40 a month to stay in the apartment, and while I was there, an opportunity came up to research pecans," he said. Grauke worked on a Masters in pecan research under Professor Jay Benton Storey from the Dept. of Horticultural Sciences at Texas A&M and continued on with Professor Storey to get a Ph.D. in pecans as well.

Soon after earning the Ph.D., Grauke and his wife had a baby, and he needed a steady job to provide. He interviewed for a job at the LSU Pecan station while his wife and baby were still in the hospital. He was hired and he began his collections of pecans.

"I had the opportunity to work with native populations of pecans and collect wild hickories that no one else cared about," said Grauke. "We made global connections and collected wild hickories from Vietnam through China. This turned out to be a valuable opportunity."

"We have characterized diversity

STRENGTH IN NUMBERS



When we come together as an industry, our collective voice is stronger and our impact is greater.
Become a member today - apgpower.org



at levels that we do not know how to use diversity; however, in characterizing the diversity that we do have of pecans across its range, we have contributed to the development of tools that will be valuable in developing road maps that can take us into traits of the other species and incorporate into breeding,” noted Grauke. “If we can continue to work with the diversity that we have in hand, we will do a better job in breeding.”

Grauke explained that the USDA has done a great job creating a long-term foundation to house the diversity of the Pecan Genetic facility. “While every pecan region has its constraints, we have to work cooperatively to use that for the benefit of all,” he said.

Currently, Lakota is the most resistant pecan cultivar that has been released. “There is a possibility that the genes it carries (that conveys scab resistance) come from a wild relative,” Grauke said. “Our genetic

markers can help us see that, which changes the strategy of breeding that may do more incorporation with wild relatives. We can only do that if we have road maps into the cultivar. These are long-term efforts, and we don’t expect the industry to wait for the cultivars we are developing. That’s why the government has always had efforts that maintain genetic diversity that facilitate breeding over the long-term.”

It’s crucial to maintain a tight linkage with the regional industries, because developing scab resistance may be valuable in the Southeast, but not in the Southwest. That’s where salt tolerance is essential. “We have materials that we suspect to have salt tolerance; however, we do not currently have a finished cultivar or rootstock available.”

It used to take 35 years to start the cross and then finally release of a cultivar; but fortunately with today’s technology, it can now be

done more quickly. “We can now do it faster with molecular genetics and markers, and we are developing more tools with cooperative efforts across the country on the development of these tools,” he said.

Grauke cited the work of Jennifer Randall, a Plant Molecular Biologist and Plant Pathologist at New Mexico State University and Patrick Conner, overseeing the pecan-breeding program at University of Georgia. “Both have been pivotal in so many of these pecan breeding efforts,” he said, adding that the Samuel Roberts Noble Foundation provides research money and has greatly cooperated assisted the pecan industry.

Current Research is focused on nutritional quality that can impact selection toward traits, which are not on the industry’s radar. “The industry most likely is not thinking in this direction,” he noted.

Grauke will retire December of this year; but he shared that if

(continued on page 37)



When maximizing your harvest is all that counts...

It’s best to choose your shaker wisely.

Since 1990, we have hand-crafted our tree shakers with precision technology. Orchard-Rite® tree shakers are engineered, assembled and serviced by people who have a vested interest in your success. Experience pure performance when you harvest with an Orchard-Rite® tree shaker.

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

-  **HydraShake™** operating system offers a faster delivery and customizable rate of power, allowing for a concise powerful shake so the operator can shake more in less time.
-  **AccuShake™** uniformly shakes the orchard using variation in shake timing and engine speed, clearing trees faster and easier than before.
-  **WetHead®** cooling and lubrication system, featuring Shurflo® electric injection system.
-  **Many included safety features** such as back-up cameras, reduced engine noise, LED lighting and a reinforced anchor assembly.
-  **Designed with operator comfort** in mind. Includes A/C and heat, Bluetooth stereo, adjustable seat and foot controls, telescoping steering wheel and flotation tires.

Orchard-Rite®

Pure Power. Pure Performance. Pure Orchard-Rite.

PACIFIC DISTRIBUTING INCORPORATED

Authorized Distributor of Orchard-Rite® Tree Shakers

559-564-3114 | orchard-rite.com

The Power of US Pistachio Industry's Generic Program

New Analysis Quantifies Value of APG Marketing Efforts

American Pistachio Growers' (APG) efforts to reduce or eliminate trade barriers in several key overseas markets have been a significant boon to pistachio exports and to growers' bottom-line. A new study, "An Analysis of the Effects of the American Pistachio Growers' Program to Reduce/Eliminate Tariffs on U.S. Pistachios," has quantified, for the first time, the direct benefit to the U.S. pistachio industry from APG's strategic program to vanquish trade barriers.

The analysis from Dr. Dennis H. Tootelian, an emeritus Professor of Marketing, sought to determine what shipments of U.S. pistachios would have been if tariffs had not been lowered or eliminated in Israel, Mexico, China and Hong Kong, and the European Union which are the export markets prioritized for focus

by APG. Many of his analyses centered on the period from 2009 through 2017 – the period in which tariffs were reduced in all five geographic areas.

Tootelian's study showed that actual shipments of U.S. pistachios after the tariffs were reduced or eliminated for each export market were more than 2.3 billion pounds greater than what would have been expected had the tariffs remained in place. Equated in economic terms, the boost in export volume after the trade barriers had been removed amounted to nearly \$3 billion greater value than what would have been



Dr. Dennis H. Tootelian

expected had the tariffs remained in effect.

While Tootelian did not have any prior expectations of what his study would show, he was surprised by the findings.

"To see this kind of an increase in shipments on a before and after basis with the tariffs did surprise me. I did not expect this kind of result in the marketplace. These are not small numbers," Tootelian said. "What the data tell me is that there is latent demand for U.S. pistachios and once the tariffs come down, foreign markets want to buy them."

Tootelian said the projected economic boon to U.S. growers is even more profound if the fluctuations in prices in China and Hong Kong were eliminated from the analysis.

"If you take the price fluctuations



Pistachio Growers!

Keep Pistachio news coming to you every month in Pacific Nut Producer.

Send back your subscription card today to keep PNP coming FREE!



in China and Hong Kong out, the increase in value of pistachio shipments amounts to nearly \$355 million more dollars per year – nearly \$4.5 billion in total from the time when tariffs were in effect to after they were reduced or eliminated,” said Tootelian.

Data from the analysis estimated that more than 1.7 billion pounds

of U.S. pistachios in total, or an average of more than 192 million pounds annually, may have gone into storage if they were not diverted to other markets. While the effect of the projected added supply on the world market is unknown in terms of lower prices, Tootelian said that it would surely have had a detrimental

(continued on page 38)



LJ Grauke

(continued from page 35)

he was still breeding pecans, he would work on size control. “I have a greenhouse filled with obscure dwarf hickory species. He noted *Carya floridina*, a shrub hickory with many specimens no taller than 16 feet. “Associating the genes that contribute to size control in the most dwarfing individuals and then incorporating those genes into pecans would be extremely valuable,” he noted. “This would allow higher stocking densities, and we can have a concentration of the energy of the tree on the production of the crop.”

Grauke noted he would like to domesticate the pecan tree. “We are growing and grafting trees that were selected out of the wild. The trees are basically representations of the native forest. We are making crosses, but we need to control traits that make orchards more productive based on improved patterns, and we have not done that yet,” he said. And now you know a little more about L.J. Grauke, which is not to say he does not know about growers. “The US pecan industry is a fantastic group of people. It’s made up of families that have been stewards of trees and land for generations, and they do it well; they do it conscientiously,” Grauke noted. “Pecans are the American nut, and I am proud to have been able to work on the plant side of the industry, with the many families I have worked with. The cooperators of my research are great friends of mine.”

PNP



Reverse Fan Technology

Contact us:
Ph: (559) 636-6546
www.airfan.com



AIR-FAN
RAISING THE BAR SINCE 1945

1. Cummins 173 hp T41 diesel engine
2. Myers 2-stage centrifugal pump
3. 40" Reverse Fan technology (simply better)
4. Come see our NEW mechanical agitation!

See our QR code to watch the D-40R Spray!



D-40R 500

SAVE THE DATE!

Tree & Vine EXPO

November 10, 2020 • Stanislaus County Fairgrounds
An event for Almond, Walnut, Tree Fruit & Wine Grape Growers, Since 1997

Thanks to you, our sponsors, exhibitors, and attendees, the 2019 Tree & Vine Expo is in the books and was another very successful event!

Hosted by the people who keep the industry informed

Malcolm Media • Ag Publishing
Call 559-298-6020 for Exhibit or Sponsor Info
www.agexpo.biz

American Vineyard **California**
PACIFIC NUT PRODUCER

Pistachio Marketing

(continued from page 37)

impact on U.S. growers.

“It is unknown what that would have done to the price,” he said. “In order to divert from storage and into other markets, prices probably would have had to come down considerably and whether they would have been able to market that much supply is an unknown.”

Underlying Tootelian’s analysis is the fact that price is not the sole determinant of the volume of U.S. pistachio exports. He said when tariffs are lowered or eliminated, traditional economics would dictate that increased shipments would lead to lower prices, but his data show demand for U.S. pistachios in some key markets remained high in the post-tariff era. Several factors, he said, appear to be in play.

“One is the reputation of U.S. pistachios, which carries a very positive market image with consumers and importers. Second, it could be the quality of the product is better or more consistent, or both, for what consumers can buy from other countries,” said Tootelian. “And third, there are a lot of reputable health studies that show nuts are healthy and nutritious. APG has invested considerable resources



2020 Oregon Hazelnut Winter Meeting

Thursday, January 16, 2020

LaSells Stewart Center

Oregon State University

Corvallis, Oregon

For more information email juli@oregonhazelnuts.org

raising consumer awareness of the healthful attributes of pistachios, and consumers appear to be willing to pay a higher price. That is pretty clear from the data.”

APG has aggressively worked in the halls of Congress, with U.S. trade officials and with foreign governmental bodies to alleviate burdensome trade barriers and create a more open market for U.S.-grown pistachios.

“Quantifying the value of APG’s efforts to growers has been difficult up to now, but this new study gives us some tangible answers to the importance of the work we are doing on behalf of the U.S. pistachio industry,” said Richard Matoian, APG’s executive director. “Frankly, we were quite surprised at the magnitude of these numbers. It’s our strong belief that whenever and wherever trade barriers exist to the free flow of American-grown pistachios around the world, we will confront them vigorously.”

In a postscript to his analysis, Tootelian added, “If I were a grower, I would be encouraging APG to be doing this more in other markets because the greater the demand there is for the product, the less goes into storage and that helps boost the price.”

PNP



Agri-Investment Services
A Division of Berkshire Hathaway HomeServices Northwest Real Estate

Specializing in the acquisition and sale of mature hazelnut orchards, new plantings and development land.

We have buyers for your orchards.

Competitive fee structure. Call today.

Brett A. Veatch | Regional Director
Berkshire Hathaway NW Agricultural Division
1.503.708.4663 | bveatch@agisg.com
www.agriinvestmentservices.com

Berkshire Hathaway Northwest Real Estate operates over thirty offices throughout Oregon and Washington. The agricultural and natural resources division is positioned to serve your needs throughout the northwest.



November 13, 2020 • The BIG Fresno Fairgrounds

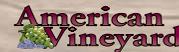
An event for Raisin, Almond, Pistachio, Walnut, Tree Fruit, Wine & Table Grape Growers, Since 1996

Thanks to you, our sponsors, exhibitors, and attendees, the 2019 Grape, Nut & Tree Fruit Expo is in the books and was another very successful event!

Hosted by the people who keep the industry informed

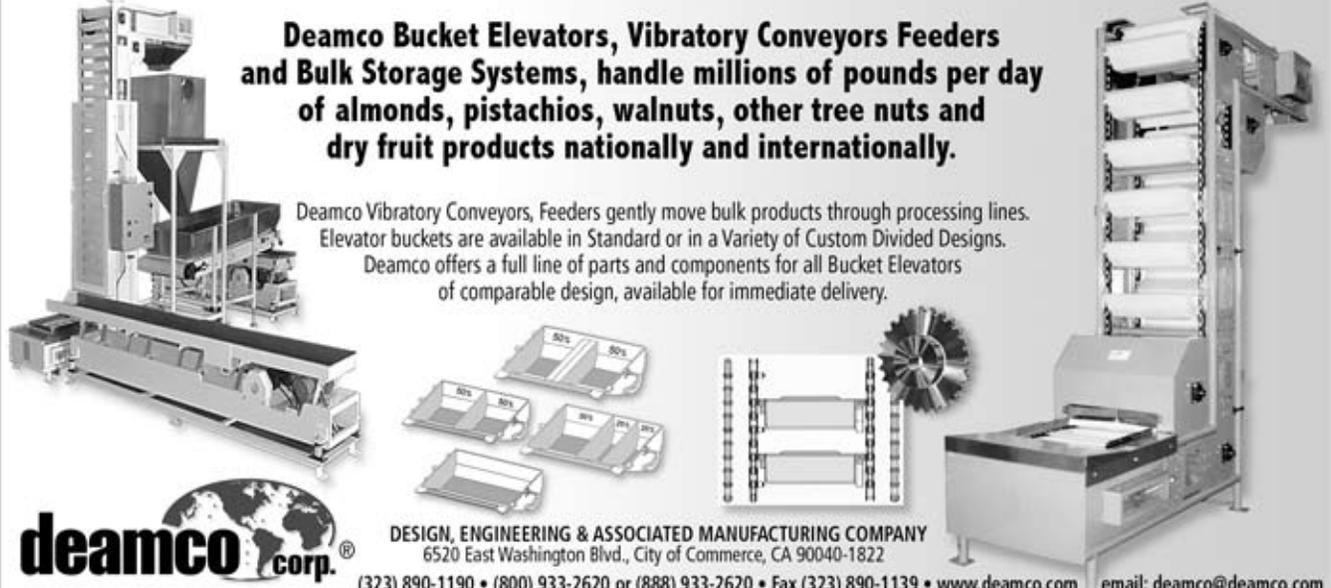


Malcolm Media • Ag Publishing
Call 559-298-6020 for Exhibit or Sponsor Info
www.agexpo.biz




Deamco Bucket Elevators, Vibratory Conveyors Feeders and Bulk Storage Systems, handle millions of pounds per day of almonds, pistachios, walnuts, other tree nuts and dry fruit products nationally and internationally.

Deamco Vibratory Conveyors, Feeders gently move bulk products through processing lines. Elevator buckets are available in Standard or in a Variety of Custom Divided Designs. Deamco offers a full line of parts and components for all Bucket Elevators of comparable design, available for immediate delivery.



deamco corp. 

DESIGN, ENGINEERING & ASSOCIATED MANUFACTURING COMPANY
6520 East Washington Blvd., City of Commerce, CA 90040-1822
(323) 890-1190 • (800) 933-2620 or (888) 933-2620 • Fax (323) 890-1139 • www.deamco.com email: deamco@deamco.com

STICK X

Stick X will remove sticks from the windrow prior to running your harvester. Potential wear and tear, as well as downtime to your harvester from sticks can be extremely expensive. The Stick X has a bolt on option of a semi conditioner. This unit will speed up the drying of nuts by stirring them and a set of fans will help remove leaves from the windrow.



The Stick X is totally operational from double quick couplings on your tractor. **NO ELECTRIC** over hydraulics needed. The conditioner attachment comes with a 540 PTO hydraulic pump.



Now taking pre-season orders!



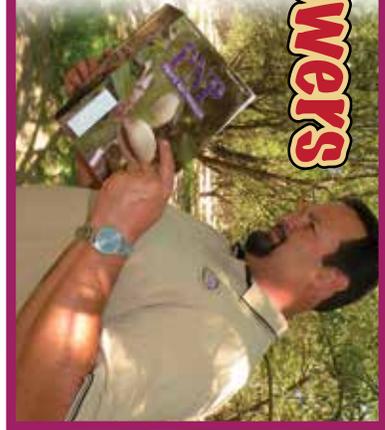
agright
ENTERPRISES

12657 28th • Madera, CA 93637-9178
Tel (559) 674-2421 • Fax (559) 674-3328
www.agrightenterprises.com

Dealers - Kuckenbecker Tractor • N&S Tractor - All Six Locations

Keep Almond news coming to you every month in Pacific Nut Producer.
Send back your subscription card today to keep PNP coming FREE!

Almond Growers



Contact Us Today for All Your Agricultural Equipment Needs

Contact Us Today for All of Your Agricultural Equipment Needs



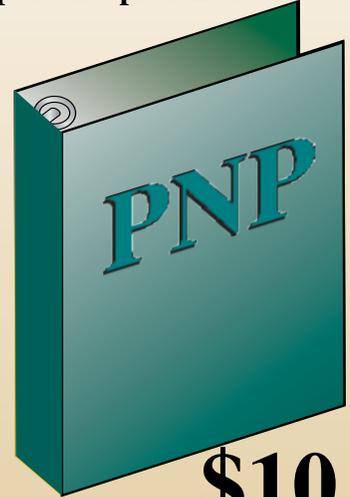
KCI-Scheidt
"The Original Cane Cutter"
40190 Rd 36 Kingsburg CA 93631-9621
Phone 559.897.3662 Fax 559.897.0201
Toll Free 1.800.300.2220
clint@kci-mfg.com
www.kci-mfg.com

- Fertilizer Spreaders
- Nut Harvesting Equipment
- Vegetable Harvesting Equipment
- Raisin Harvest Equipment
- Berry & Olive Trimmers
- Vineyard Equipment
- Orchard Equipment
- Conveyors
- Rail Car Conveyors

www.kci-mfg.com

Binders

Keep each issue of PNP organized for easy access to vital information in past and present issues



\$10

Send \$10.00 check or money order, along with name and address to:
Malcolm Media
P.O. Box 626 • Clovis, CA 93613



CALIFORNIA AG NETWORK

www.californiaagnet.com

Powered by



See the latest video ag reports
with Matthew Malcolm



Matthew Malcolm
Assistant Editor, Pacific Nut Producer Magazine

Easy access to Industry
Information on
californiaagnet.com

- Ag Industry News and Video Ag Reports
- Link to Research
- Industry events
- Link to Weather
- FREE Classified Ads



Now Featuring grower
Christine Gemperle on
achieving zero waste in
the almond orchard by
2025

Sponsored by:



www.californiaagnet.com

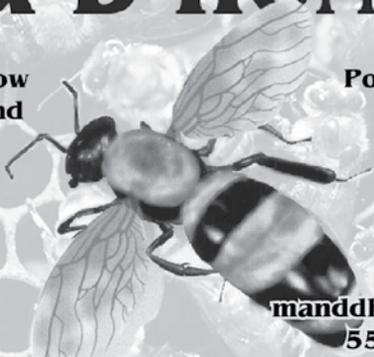
M & D HONEY

**Reserve Bees Now
for 2020 Almond
Pollination**

**Mike & Donna
Tolmachoff**

**Pollination Service
Honey Sales**

manddhoney@gmail.com
559-974-4042
www.manddhoney.com



Wizard Manufacturing, Inc.



**Your Walnut Huller
and Dryer Provider**

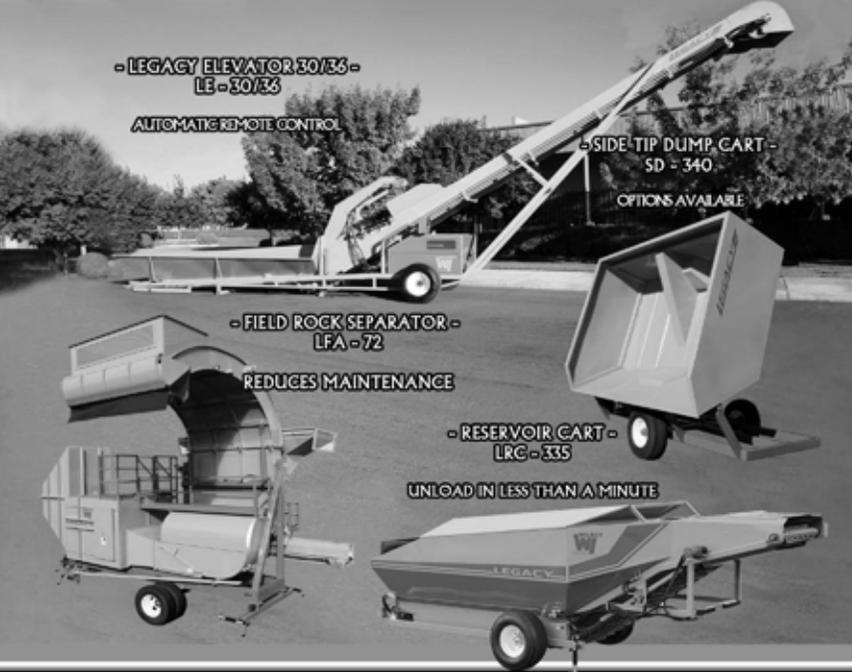
Wizard Manufacturing Inc.
2244 Ivy Street • Chico, California 95928
Phone (530) 342-1861

www.wizardmanufacturing.com
Email info@wizardmanufacturing.com

LEGACY INDUSTRIES

A Tradition of Innovative Equipment
Agricultural • Industrial





- LEGACY ELEVATOR 30/36 -
LE - 30/36

AUTOMATIC REMOTE CONTROL

- SIDE TIP DUMP CART -
SD - 340

OPTIONS AVAILABLE

- FIELD ROCK SEPARATOR -
LFA - 72

REDUCES MAINTENANCE

- RESERVOIR CART -
LRC - 335

UNLOAD IN LESS THAN A MINUTE

LegacyIndustriesLLC.com • 209.656.0561

T. G. Schmeiser Co., Inc. announces Sargon Kaninya as Manager.

Mr. Kaninya brings a vast background of experience and education to his new position. After graduating with a Bachelor of Science Degree in Industrial Technology, he furthered his education receiving a Master of Science Degree in Industrial Technology from CSU Fresno. From there, he continued his education at Indiana University receiving both a Master of Business Administration and a Master of Science in Global Supply Chain Management from their Kelley School of Business.

Prior to working at Schmeiser, Mr. Kaninya worked as a Production Manager for Jain Irrigation and most recently the Master Scheduler at Floway Pumps.

With his education and work experience, T G Schmeiser Co. sees Mr. Kaninya a perfect match for their needs. When asked, Mr. Kaninya looks forward to contributing his manufacturing and supply chain experience to Schmeiser's legacy of top quality and excellent service.

For further information, contact T. G. Schmeiser at 559-268-8128 or visit their website at www.tgschmeiser.com.

Minimum Wage Rates Increase Jan. 1

With all the new employment-law changes going into effect on Jan. 1, it can be easy to forget the changes that were set in motion years ago. For that reason, we remind you that California's minimum wage is increasing (again) for all employers, and the overtime thresholds for agricultural employees working under Industrial Welfare Commission Wage Order No.14-2001 are decreasing. Here is a quick re-fresher:

Minimum Wage Rates Increase

In 2017, California’s minimum wage began a series of increases intended to raise the state minimum wage to \$15.

The next increases take effect on Jan. 1, as the state minimum wage will increase to \$12 per hour for employers with 25 or fewer employees and to \$13 per hour for employers with 26 or more employees.

While these increases obviously affect employees earning minimum wage, these increases also raise the minimum salary requirement for exempt personnel. (To be classified as exempt from minimum-wage, overtime-pay and time-record-keeping requirements, an employee must meet both a “duties test” and a “salary test.”)

Effective Jan. 1, the minimum salary for exempt employees of employers with 25 or fewer employees will increase to \$49,920 per year (or \$4,160 per month), and to \$54,080 per year (or \$4,506.67 per month) for exempt employees of employers with 26 or more employees.

Wage Order 14 Overtime Thresholds Decrease

In 2016, Assembly Bill 1066 set in motion the gradual lowering of the daily and weekly hours of work thresholds for paying overtime to non-exempt agricultural employees working under Wage Order 14.

Effective Jan. 1, the overtime thresholds for non-exempt employees of employers with 26 or more employees will be nine hours per workday or 50 hours per workweek. For non-exempt employees of employers with 25 or fewer employees, the overtime threshold is still 10 hours per workday.

Overtime pay for work done on the seventh consecutive day of work in a workweek remains the same as in the past.

Determining If You Have 26 or More Employees

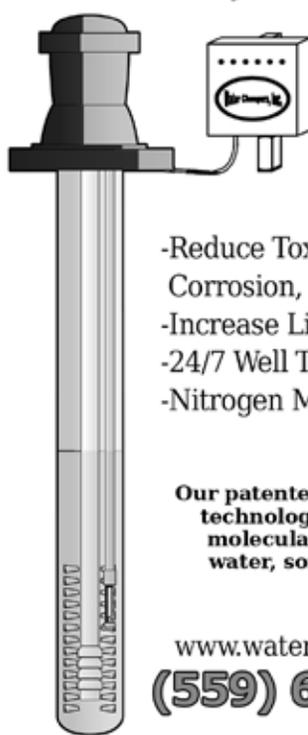
As previously explained, because the requirements depend on whether an employer has 26 or more employees, it is important to understand how employees are counted.

An employer’s own direct-hire employees and any employees of a farm labor contractor provided to the employer must be counted together. In addition, if an FLC has 26 or more employees, then the FLC’s employees are entitled to the large-employer rates regardless of how many employees are located at their jobsites.

Employers with questions
(continued on page 44)

Water Changers, Inc.

“The solution to your water problems.”



- Reduce Toxins, pH, Scale, Corrosion, Iron Bacteria
- Increase Life & GPM
- 24/7 Well Treatment
- Nitrogen Management

Our patented, computerized technology changes the molecular structure of water, soil, and tissue.

www.waterchangers.com
(559) 645-1462

Clonal Paradox

Available Through Licensed Nurseries

Clones Available

VX211, RX1, Vlach

- Crown gall free
- Nematode resistant
- Phytophthora resistant
- High vigor

From Lab to Field



“In 4 months my VX211 was ready for June bud” - Chris Turkovich, Winters, CA



Parm Randhawa

(916) 764-2214



QUICK & EASY OPERATION PRUNE YOUR ORCHARD FASTER

Newly designed Nelson TREE SQUIRREL® pruning & picking towers are built for productivity.

Operator's platform is now enclosed and roomier while **RETRACTING DRIVE-WHEELS** simplify Towing setup.

Operator efficiency is enhanced with 2 ground speeds, smooth hydraulic action and excellent maneuverability.

- 20' and 25' models
- Smooth action
- 2-speed drive
- 25HP Kubota diesel engine
- Powdercoat finish



CALL FOR A
DEALER NEAR YOU!

NELSONHARDIE.COM

See us at the World Ag Expo, N-25, and the Colusa Farmshow, 613 Outside

NELSON MFG. CO., INC. • 2860 COLUSA HIGHWAY, YUBA CITY, CA 95993
530-673-0919 • INFO@NELSONHARDIE.COM

FYI

(continued from page 43)

about minimum wage or overtime thresholds, or about how employees are counted under these rules, are encouraged to contact Barsamian & Moody at (559) 248-2360. Given the substantial liability that can result from wage-and-hour violations, this is one area you absolutely want to make sure you are compliant with.

The goal of this article is to provide employers with current information on labor and employment law. Their contents should be neither interpreted nor construed as legal advice or opinion. The reader should consult with Barsamian & Moody at (559) 248-2360 for individual responses to questions or concerns about any given situation.

Source: Barsamian & Moody

JFS ENTERPRISES Inc.

- Vineyard & Orchard Removal Specialists
- Vineyard & Orchard Grinding
- Deep Ripping
- All Aspects of Land Development

Serving all of California
559-664-8863

Want Healthy Roots Like These?

AgBioChem, Inc. provides the most effective biological and chemical Crown Gall control products available today.

Galltrol

Prevents Crown Gall, a serious plant disease that reduces yields and shortens the life of your trees, vines, and shrubs.

Gallex

Eradicates galls on diseased plants. The only product that controls Crown Gall after tumors are formed.

AgBioChem, Inc.

530.586.1561 | www.agbiochem.com | agbiochem9@gmail.com

Costs Only
Pennies
Per Tree!

TREE STAKES

Mill Direct to Growers

- New product - 2" and 2 1/4" x 4' thru 8' round stakes, treated and untreated. Strong & durable
- 1x1, 1x2, 2x2, all lengths. nursery stakes, round posts
- Tree Props - Laminated and wood - all sizes
- Hopp poles, RR ties, Utility poles, pallet material

Eugene Forest Products, Inc.
1145 Chambers St. Eugene, OR
www.eugeneforestproducts.com

Dave Lindanger -
U.S. - Mexico
559-229-3500, Fresno, CA
davelindanger@hotmail.com



Classified Ads

BEES

WWW.POLLINATIONBOARD.COM

Find verified beekeepers. Receive competitive price bids. Get your hives inspected.

EQUIPMENT

USED HARVESTING EQUIPMENT

2011 Thomas Shuttle Truck, \$69,950; 2010 Orchard Rite Bullet Shaker, \$59,950; 2010 Weiss McNair 9800P Walnut Harvester, \$42,500; Weiss McNair 9800 Walnut Harvester, \$35,000; Wizard R9 and R12 walnut hullers—Collins De-Sticker, \$7,500; Weiss McNair 8900P pecan harvester, \$29,950; 2006 New Holland TN75A tractor with Weiss 8 1/2' sweeper and B85 Blower, \$29,950; Jack Rabbit Conveyor Cart with walnut chains, \$15,000. **Free Delivery California**, Call Henry; @209-531-8398 or E-mail henry@colomboequipment.com and see pictures at www.colomboequipment.com

Klippenstein Box Former/Sealer - \$43000 (Kerman, Ca.) Klippenstein Model K731HM, s/n 13409 Sealer 480 volt; Klippenstein Model KE300HM, s/n 13209 50# Box Former 480 volt 9'9" wide at former, overall length 28' currently functioning at an almond processor Contact Pat at pat@panochecreek.com

NURSERIES

Alex M. Suchan Nursery: Authentic Paradox hybrid walnut bare root trees and sprouted seeds (*juglans hindsii* x *juglans regia*). Very, very low incidence of crown gall. Beautiful branched root systems. (707)275-2461 www.suchannursery.com

Walnut Clones Available Now. VX211, RX1, Vlach, WIP3, Self Rooted Chandler. Container Grown. Visit us at GoldenRootsNursery.com or call 530.354.6464

SERVICES

Need help with harvest?

Custom almond/walnut/winter shaking Serving the Stanislaus and Surrounding areas (209)678-8072

41 Years

of Innovation in Mechanized Harvesting



- Aftermarket replacement parts for most harvesters, tree shakers & sweepers
- Parts & Service 24 Hours a Day • 7 Days a Week

agright
ENTERPRISES
Specializing in Agricultural Machinery
559-674-2421
12657 Road 28 1/4 • Madera, CA 93637

WINTER SANITATION

Do your floors look like this?



Look for our premier California dealers in:

KERN MACHINERY	LAWRENCE TRACTOR	MAC'S EQUIPMENT	N&S TRACTOR	RED BARN
Bakersfield, CA	Visalia, CA	Kerman, CA	Colusa, CA	Modesto, CA
Buttonwillow, CA	Hanford, CA	Tranquility, CA	Dos Palos, CA	
Delano, CA	Tipton, CA	Madera, CA	Merced, CA	
			Stockton, CA	
			Turlock, CA	
			Willows, CA	
			Yuba City, CA	



800.204.3122 | www.nwtiller.com

Hazelnut

(continued from page 7)

for hazelnut trees in their initial years of establishment, as their rooting zone starts off so small. It's really important to keep the roots wet, as the summer can be quite hot and dry. "We are on a 30-inch spacing with a .26 emitter," he explained. "So in four hours of watering, we are getting a quarter of an inch down, and we will water 4-6 hours a day during the heat of the summer. I recognize that it is oversaturating the area, but I feel like the surrounding soil is so dry that it is constantly pulling that moisture away; though, I would not water like that with over-head irrigation."

Trunk Guards, Paint & Mice

Kuehne generally starts his trees off with a bamboo support and tree covers/trunk guards. The trunk guards can help and harm the trees (watch video with



OSU on trunk guards vs. paint at PacificNutProducer.com); however, Kuehne feels the trunk guards are mostly beneficial in that first year of orchard establishment. He removes them in the second year, and paints the trunks to protect them from sunscald (watch video with OSU on sunscald at PacificNutProducer.



Copper that absorbs and lasts longer

- Highly effective bactericide & fungicide
- Copper is fully absorbed into plant tissue within 3 hours
- Rain fast protection because it stays in tissues, not on the surface
- Continuous active ion disease control technology
- Tank mix safe with many pesticides
- Low dose, easy to use true solution
- No visual residue or staining

SymAgro

www.sym-agro.com

541-607-5097 Info@Sym-Agro.com

Smart - Effective
Low Dose Copper
Fungicide

FRAC Group M01

48-Hour REI
0-Day PHI
MRL Exempt

com). Mice are a big problem in some of his young orchards, and they enjoy chewing on the developing bark of the young trees. Baiting, as well as removing the trunk guards in that second year helps to eliminate the problem to a certain extent (as the trunk guards offered shelter and protection to them).

Looking down his beautiful, uniform rows of young hazelnut trees over the crop of ryegrass with his wife and kids, Kuehne reflects on the thrill of planting a new orchard and anticipates the great potential of his investment, which he plans to reap for decades to come.

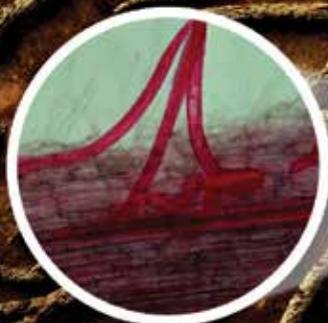
Editor's note: Watch brief interviews with Paul Kuehne from Creekside Valley Farms at PacificNutProducer.com for more information.

PNP

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



VELUM[®]
ONE



Nematodes are the invisible threat to almond orchards.
Protect your crops from nematode damage with Velum[®] One.

- Protection from wide-spectrum nematode damage.
- 58% average increase in canopy diameter in newly planted trees²
- Can increase yield 8.3% with an average of \$475/bearing acre¹
- Convenient in-season application via chemigation.

For more information, visit www.VelumOne.com.

¹ 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.

² 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.



Rare Earth Organics bajagypsum

95% Purity Dihydrate Gypsum

Highest Quality, Lowest Efficient Cost

Baja Dihydrate Gypsum contains 2 H₂O molecules in its structure, making it extremely water-soluble for maximum nutrient absorption.

Baja Dihydrate Gypsum

95% Purity - Fast Acting - Highly Water Soluble - Available Year Around
Allows Rapid Nutrient Delivery To The Plant

Santa Rosalia
Baja CA Sur, Mexico

95% Dihydrate Gypsum †

F.O.B. Port of Stockton, CA

San Marcos Island
Baja CA Sur, Mexico

95% Dihydrate Gypsum (White) †

F.O.B. Port of Stockton, CA

† Organic Materials Review Institute for Farmers and Organic Professionals, www.omri.org



Note: Rare Earth Organics does NOT supply ANHYDRITE.

ANHYDRITE cannot be labeled as GYPSUM because ANHYDRITE lacks H₂O molecules in its structure, hindering its solubility, slowing its absorption rate. ANHYDRITE is not as effective on reducing soil salinity.

WWW.RAREEARTHORGANICS.COM

WWW.BAJAGYPSUM.COM



RARE EARTH ORGANICS BAJA GYPSUM 95
Sold by Rare Earth Organics Company, LLC | Ceres, CA
Sales: Kris Helton

209.272.3620 | sales@rareearthorganics.com

**TRANSPORTATION SERVICES
AVAILABLE**

