



MARCH | APRIL 2016

almond **FACTS**

News, Views & Industry Insights



**Board Tours
New Plant
Projects**

**MASTERS
Program
Kicks Off**

**Young Grower
Speaks for Ag**

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Cover Photo:

Blue Diamond's Board of Directors tours the Sacramento Manufacturing Plant to view recent upgrades and technological improvement projects.



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Blue Diamond, the world's largest processor and marketer of almonds, exports to 90 countries. The cooperative marketing corporation also markets hazelnuts.

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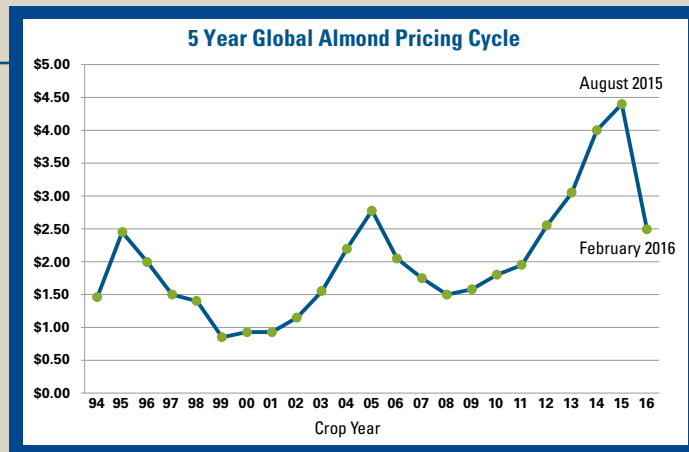
Much of the almond industry believes they are “marketing” almonds by letting their call pool handler inform its broker that they are ready to sell. Respectfully, this is confusing marketing with trading, which is no more than taking advantage of timing. Marketing is distinguished by understanding consumer needs, developing new products, building brands and collaborating with customers to generate profitable demand for almonds. Marketing is always an effective strategy, but there are times when a trading strategy can be nearly as effective. The industry just completed one those eras when trading almonds was so profitable that it attracted many new entrants to the industry.

For more than six years, the market prices for almonds consistently rose, never selling for less than the previous year. As the drought suppressed yields, prices spiked. By last summer, almonds had become the most costly tree nut. It was a good time to strengthen balance sheets of growers and handlers.

As prices reached historically high levels, the industry experienced a reduction in market demand. In times of tight supplies, price is used to ration the available quantities. However, demand-erosion occurred and pricing had become over-inflated.

Blue Diamond's strategic plans anticipated the 2015 crop to be the peak of almond prices over our five-year planning horizon. We forecasted an El Niño water year, combined with increasing acreage, would result in expectations for larger future crops and price changes.

The unexpected news of a healthy 2015 crop with a slight increase in market supply triggered the price decline. The speed of the price correction unsettled the market. Purchases were made at prices \$1.50 above current market by the time the product reached the customer. When those customers needed to resell, they sometimes defaulted on those contracts leaving



containers orphaned in port, searching for new customers. Later, they sold at discount to the already lower market prices, further contributing to the downward pricing spiral.

It seems counter-intuitive, but lowering prices reduced demand. This deflationary environment caused buyers to delay purchases and even reduce consumption. They knew that by waiting prices would go lower. Price stability or defining a floor to prices was necessary to give buyers the confidence to buy now.

As I write this article, it appears market prices have returned to historically normal levels or similar to those of 2012. California growers, the most productive, efficient and sustainable in the world, are better positioned to maintain profitability at these economic levels, but other producing countries will be pressured to break-even. This gives us a platform from which to restore market confidence and rebuild demand.

Blue Diamond is a marketing co-op. Our business is almond demand generation. In the last five years we have tripled our advertising expenditures, continued to innovate new almond products, opened 45 international markets to our consumer brand and achieved two-thirds of our revenues through value-added products.

With the moderation in almond prices, *Blue Diamond* is doubling down on our marketing investments. We are debuting new *Almond Breeze* television advertising, committing to significant advertising for snack almonds during the Olympics and continuing to invest in new innovative products that will build our growers' bottom line. *Blue Diamond* will continue driving market growth through innovative products and marketing, ensuring a strong future for our cooperative.



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Board Directors Gain Insight into Sacramento Plant Operations

The *Blue Diamond* board of directors took an in-depth tour of the Sacramento processing facility in conjunction with their February board meeting at the cooperative's headquarters. While significant improvement projects in Salida and Turlock have received much attention, the Sacramento facility has also been implementing important projects of its own to support global manufacturing operations key focus areas of safety, quality, customer service, and performance. The tour was the perfect opportunity to familiarize the board with these projects and show how each is helping to contribute to a better bottom line for *Blue Diamond's* grower-owners.

Jeff Hatfield, *Blue Diamond's* Sacramento site director, recently joined the cooperative and was excited for the opportunity to show off the plant and experienced team he now leads. "We wanted to highlight the strategic importance of our Sacramento site in terms of the volume we support, the positive impact the site has on the overall operation, and the value of our experienced team members, who have 27 years of average tenure," he said. "The team did a great job to ensure the visit was a success. The factory looked great and some team members presented projects to the Board that have delivered great value to the organization."

Hatfield described, the tour, which took the board on a ride around the main factory and infrastructure involving

the Distribution Center, receiving, storage silos, and shop areas. They viewed some of the busiest operations housed within the 90-acre property in Sacramento, including the *Blue Diamond* Building (red brick building located adjacent to the main factory), the Main Production Line, Inshell line, the Manufacturing area of the plant and finally, through Retail Packaging. The tour also highlighted the Test Room, where all quality testing is completed to determine grower payments, as well as the cooperative's ISO Certified Laboratory that ensures food safety on finished product shipments to meet highest customer standards. The ISO is a globally recognized authoritative body that sets standards for food manufacturing facilities.





Specific improvement projects that were highlighted included:

- Food safety enhancements made to the continuous cookers, including upgrading the conveyor in-feed belts and oil filtration systems. These cookers are most commonly used to produce oil-roasted almonds such as Smokehouse, Low Sodium, Roasted Salted, Wasabi & Soy and Honey Roast.
- Food safety enhancements to the small particle roaster, including upgrades to the in-feed system, filtration system and renovated centrifuges to improve performance. This equipment is used for such Global Ingredient products as roasted blanched almond slivers and roasted diced almonds.
- New electronic sorting equipment for the removal of foreign material and improve overall quality is currently being tested to replace existing technologies.
- Sprint team work on the Butter Mill and Vend Pack lines that increased throughput, and delivered margin enhancements with minimal investment.

“Our team was pleased to show great progress with improvements in safety, quality, yield and throughput, as well as the volume of work we do here in Sacramento to deliver the benefits of almonds to the world!” Hatfield said.



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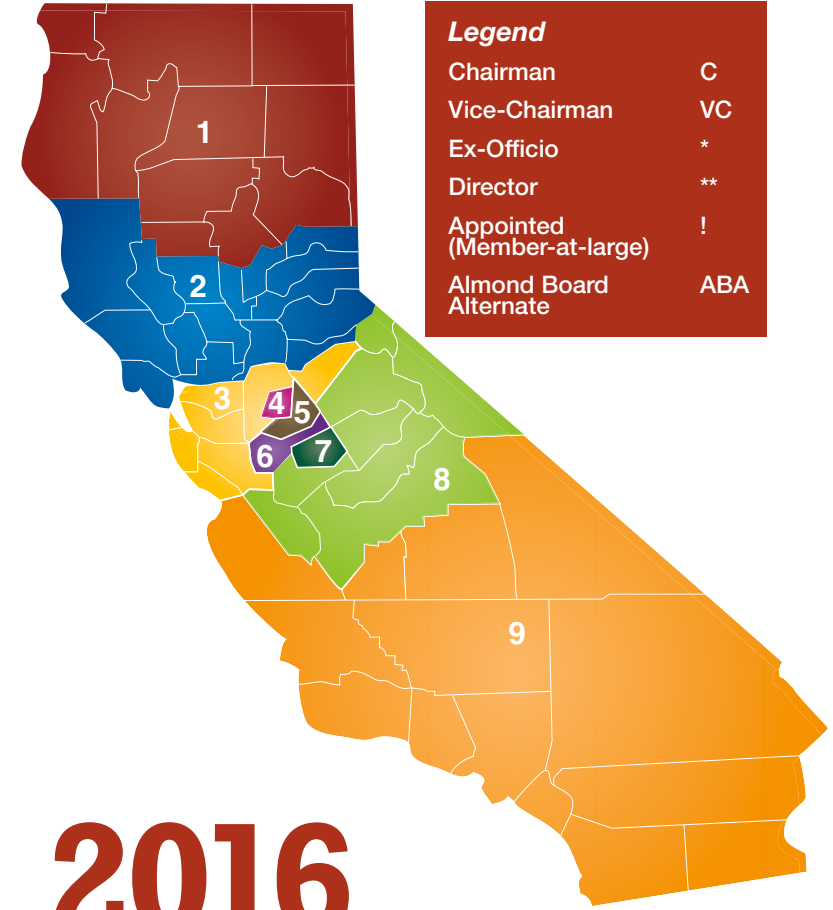
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#CAonMyPlate Social Media Debut

On February 25, people took to social media to celebrate and promote California agriculture. Photos of the food grown in California spread across Facebook, Twitter and Instagram with the hashtag #CAonMyPlate. The hashtag was created by Cultivate California, a California agriculture education campaign. To join the effort, visit cultivatecalifornia.org or post a picture with #CAonMyPlate.

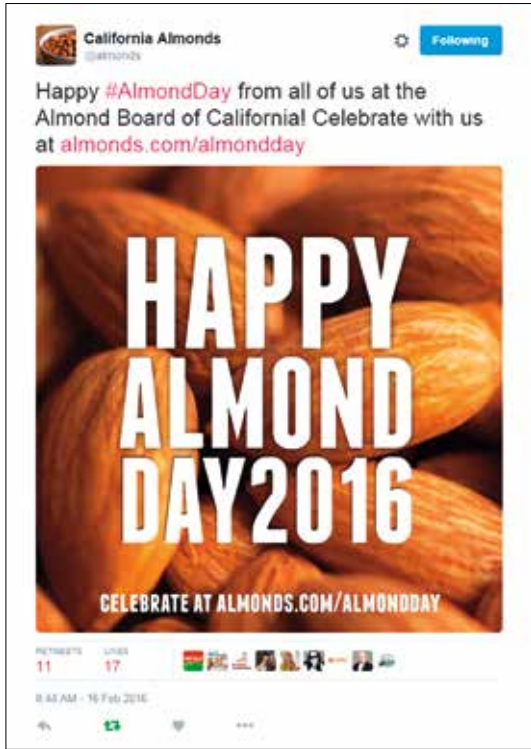
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Blue Diamond board directors Dale Van Groningen, Don Yee, Steve Van Duyn and Joe Huston at the Agricultural Council of California's Golf Tournament in Napa, CA

Japanese *Almond Breeze* Partner Visits *Blue Diamond* Grower

A group representing the cooperative's Japan *Almond Breeze* partner, Marusan, learns about *Blue Diamond* grower James Kinzie's operations.



Cooperative Wins Big at NCFC Information Fair


The National Council of Farmer Cooperatives' annual meeting took place in February, drawing members of different cooperatives from all over the country. At the meeting, NCFC awards cooperatives for their communication and marketing efforts during the previous year at their annual Information Fair. *Blue*

Diamond won a total of 13 awards at the meeting, particularly notable was a fifth consecutive first place award for Almond Facts! Other first place awards included the categories: Social Media Campaign, Marketing Campaign, Package Design, Advertising Leaflet, and Color Advertisement.

New Study: Eat a Handful of Almonds, Boost Your Diet

A new study conducted by the University of Florida and funded by the Almond Board of California suggests adding a daily handful of almonds can improve one's diet. The study was based on 28 parent-child pairs. The adults were to eat 1.5 ounces, while the children were instructed to eat half an ounce a day over 14 weeks. The results showed a significant increase in both parent and child Healthy Eating Index scores for total protein foods and decreased in empty food calories, suggesting that almonds are a great way to improve not only adults' but children's diets.

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USA Volleyball Teams Up with Almond Breeze

USA Volleyball and *Blue Diamond Almond Breeze* have partnered for the 2016 Summer Olympic Games, making *Almond Breeze* the organization's official almondmilk. *Blue Diamond* will be providing *Almond Breeze* to USA Volleyball team members, coaches, trainers, chefs and nutritionists as a good alternative to dairy beverages.

"USA Volleyball welcomes *Blue Diamond Almond Breeze* to our growing list of valued partners," USA Volleyball Secretary General Kerry Klostermann said. "By partnering with *Almond Breeze*, a beverage that offers consumers and athletes a healthy lifestyle option, we can provide added value to our National Team athletes and support staff to promote greater success in training and competition. Our athletes serve as healthy, strong and courageous role models for our hundreds of thousands of junior athletes, and this partnership helps connect the two groups with better-for-you choices."

Blue Diamond Almond Breeze will not only help fuel Team USA Volleyball athletes, but will have a presence at select USA Volleyball events, including the USA Junior Beach Tour and Tour Championships, 2016 USA Volleyball Girls' Junior National Championships, 2016 USA Volleyball Boys' Junior National Championships and the USA Volleyball Open National Championships.

"We are thrilled to partner with and support Team USA Volleyball as they prepare for GOLD in the 2016 Rio Summer Olympic games," said Suzanne Hagener, Group Marketing Manager at *Blue Diamond*. "Our cooperative has been a longtime supporter and partner of various USA athletic teams. The USA Volleyball Teams are tireless in their efforts to train and perform, and *Almond Breeze* could not be more proud to support and fuel these athletes with our variety of almondmilk."

Blue Diamond Almond Breeze comes in a wide range of sizes and flavors – many of which are available in both refrigerated and shelf-stable varieties. Refrigerated varieties can be immediately poured over cereal or consumed chilled in a standalone glass; shelf-stable varieties offer the convenience of *Almond Breeze* any time, but do not need to be refrigerated until opened. Most recently, *Almond Breeze* introduced its newest, creamy offering – the *Almond Breeze* Almondmilk Cashewmilk.

Founded in 1928, USA Volleyball is a Colorado incorporated non-profit organization recognized by the United States Olympic Committee (USOC) and the Federation International de Volleyball (FIVB) as the National Governing Body for the disciplines of beach volleyball, indoor volleyball and sitting volleyball in the United States. USA Volleyball has over 325,000 registered members, 12,000 teams and 5,300 clubs nationwide.

USA Volleyball has a rich tradition of success as evidenced by winning an Olympic medal in every Olympic Games since 1984, three Paralympic medals since 2004 and capturing numerous World Cup, World Championship and Continental Championship titles. USA Volleyball is committed to and works toward opportunity for all to participate. It is an advocate for all Americans endeavoring to assure universal access to opportunities at all levels of the game. For more information please visit www.usavolleyball.org.



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Cooperatives Partner to Introduce *Almond Breeze* to Spain

Blue Diamond launched two flavors of its popular non-dairy beverage *Almond Breeze* in Spain at the close of 2015 – the latest effort to grow the reach of the cooperative’s products throughout the world. *Blue Diamond* has partnered with Spanish dairy cooperative Feiraco to gain optimum distribution of the products throughout the Iberian Peninsula.

In consumer taste panels, *Almond Breeze* emerged as the preferred almond milk in the area and two flavors stood out among the rest – Zero, the only unsweetened almond milk available in the Spanish market, and Original, a sweetened version. Both are welcomed additions to the Spanish non-dairy beverage market as alternatives to dairy and soy milks.

In fact, in a blind taste test consumers ranked the taste of *Blue Diamond Almond Breeze* number one among leading almond milk brands in the Spanish market. In addition to its winning taste, *Blue Diamond’s* packaging was also preferred for its design and on-shelf appeal.

Almond Breeze Zero is made without any added sugar and is only 14 calories per serving. *Almond Breeze Original* is sweetened with natural cane sugar and contains just 24

calories per serving. Both varieties of *Almond Breeze* are free from soy, egg, lactose, gluten and peanuts, and are suitable for vegans and vegetarians.

“*Almond Breeze Zero* and Original are perfect for Spanish consumers who want to live a healthy lifestyle without sacrificing taste. Our products are low in saturated fat, contain zero cholesterol and are a high source of calcium,” said John Beadle, European Business Development Director.

Both products are offered in 1-liter Tetra Brik Shelf Stable Slim packaging, designed to protect food from light and air due to its composition and to the shelf stable packaging system, making it ideal for all kinds of consumer experiences by preserving food at room temperature. Additionally, both varieties have been launched with a screw cap, bringing comfort and confidence to consumers through the combination of an easy opening system with excellent security.

“The alliance between *Blue Diamond* and Feiraco in Spain and Portugal responds to the demands of today’s consumer by bringing healthy, low-calorie *Almond Breeze* to market,” Beadle said.

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The photo was taken in 1944 when Howard was 23 years old. Today, at 95, Howard's daily involvement with Flory Industries is honored and valued.

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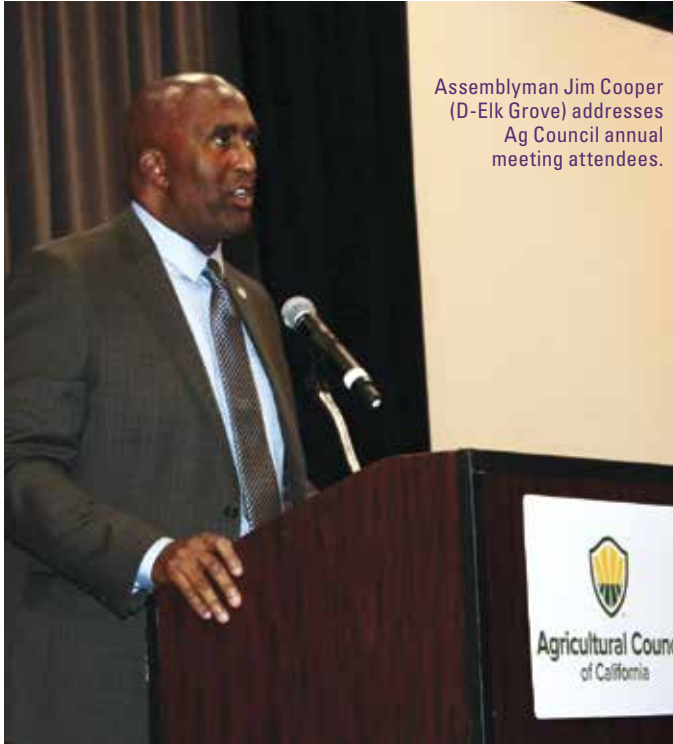
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Agricultural Council of California

EMILY ROONEY, President



Assemblyman Jim Cooper (D-Elk Grove) addresses Ag Council annual meeting attendees.

Leveraging our Strength

We had a record attendance at our 97th Annual Meeting in early March. It was a time to come together with our members, including several representatives of *Blue Diamond*, and share our successes, as well as our outlook for the future. This year's meeting theme was "Leveraging our Strength," and it is a fitting motto for our organization, as we are a small staff, but we have found effective ways to work cooperatively with members of both parties to protect agricultural businesses in California.

As our chairman Brendon Flynn noted in his opening remarks, Ag Council represents a broad breadth of

agriculture and while we historically only represented just farmer cooperatives, we now embody all facets of agriculture, which makes us a unique and powerful voice in Sacramento.

During my annual address, I discussed our organization's work in building bridges with lawmakers from both sides of the aisle. We have invested significant efforts in reaching out to moderates to help them understand the importance of agriculture to job growth and California's economic health.

The message has been heard, as Governor Brown has attended an Ag Council event at least once every year since his election. While there are ongoing challenges to agriculture, including the need for more water storage and emerging issues with Proposition 65, I am optimistic about the changes that are occurring in the legislature.

Further solidifying that opinion were some of the comments made by three members of the Moderate Democrats Caucus, "Mod Dems" for short, who were keynote speakers during our Annual Dinner. "We have to steer policies forward in a way that makes sense for farmers," said Assemblymember Bill Dodd (D-Napa). "The legislature has not treated you like the breadbasket of the world that you are—that needs to change. The economic impact of California agriculture is undeniable and we need to make sure your industry stays robust and sustainable."

Assemblymembers Rudy Salas (D-Bakersfield) and Jim Cooper (D-Elk Grove), co-chairs of the "Mod Dems" echoed those sentiments in their comments: "We all want a strong California and we all want a strong economy," said Salas. "Your industry is key to our state's economic viability and you do have champions [in the legislature] that want to take a pragmatic approach."

The General Session held the following day, and moderated by Jackson Gualco of The Gualco Group, featured Secretary of the California Department of Food and Agriculture (CDFA) Karen Ross; and Armando

Quintero, Member of the California Water Commission. The General Session was rounded out with a lively panel discussion between Democratic Communications Specialist Tracy Seff and Republican Communications Specialist Douglas Heye about the presidential election.

The 97th Annual Meeting of Ag Council concluded with a luncheon that honored Paul Martin as the recipient of the 2016 California Cultivator Award. Martin was lauded for his work with the California dairy industry as director of environmental services for Western United Dairymen (WUD). Martin served in Governor Brown's Office of Business and Economic Development from 2012 to 2014 before returning to WUD as interim CEO for the organization.

For more information, about Ag Council's Annual Meeting and upcoming events, visit www.agcouncil.org.



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MASTERS Program Engages Established Growers

More than 40 growers from across the Central Valley attended *Blue Diamond's* first MASTERS program in January. The goal of the program is to share information on key topics including future trends and tap into the expertise of our established grower-members in tackling current issues.

“MASTERS is the ideal next step for Young Leaders and growers who want to be more involved or those interested in furthering their knowledge and expertise on growing, the market and the cooperative,” said Ben Goudie, *Blue Diamond's* Membership Development Manager.

The agenda for the January meeting included California's current water challenges, advocacy within the state, the power of the *Blue Diamond* brand and an update on the Food Safety Modernization Act (FSMA). Those who attended the seminar received a plant tour of *Blue Diamond's* Turlock facility and a report on the coming growing season.

An Outlook of 2016

The cooperative's CEO and President Mark Jansen started the meeting with a conversation about the market outlook and the future of the almond industry. He discussed the current price shift, noting that right now, the market is “driven by trader dynamics and not by supply and demand.”

With anticipation of a larger 2016 crop, Jansen explained *Blue Diamond's* ability to not only handle a short crop, but also manage a large crop and use both to the cooperative's advantage. From growing *Blue Diamond's* handle in the market, expanding new product categories and growing membership, the cooperative's future is nothing but optimistic, he said.

“*Blue Diamond* is all about market development,” Jansen said. “Our investments in new markets and innovative products will create new demand for our member-growers' production.”





California Water Realities

With El Niño on the forefront of most growers' minds, Mike Wade, executive director of the Farm Water Coalition addressed the group on the current water situation within California, allowing growers to ask specific questions and raise their concerns. The group further discussed the impacts of water policies and regulations on farmers, the challenges farmers will face in the coming year and what growers themselves can do.

“What can you do as individuals to effect change?” Wade asked. “Talk to people who have the power to change the situation. You as growers can help the public understand water issues.”

At the meeting, Wade noted that California has received approximately 50 percent of the needed annual water supply, about 19 out of 40 inches. And, according to a recent report by the California Department of Water Resources, the statewide snowpack is 83 percent of the March 1 average.



Understanding FSMA

Kelly Covello, President of the Almond Hullers & Processors Association, addressed attendees to provide clarity and answer questions about the new Food Safety Modernization Act. The new regulation is raising concerns amongst growers and farmers across the country.

“Determining how regulations apply is case-specific, based on activities performed, number of employees, location, ownership structure and more,” said Covello.

Covello advocates on behalf of the almond industry, and was heavily involved in negotiating with the Food and Drug Administration on FSMA. She explained that “everyone is impacted by the rules of FSMA” as there are not only new definitions of what constitutes as a farm, but also what now applies to growers. Her advice was to implement changes as soon as possible to avoid complications and make the transition easier.

A look into the Brand’s Handle

Blue Diamond prides itself on the cooperative structure, allowing the entire process, from growing to distribution, to be managed internally. And so, the MASTERS program would not have been complete without an in-depth look into the branded side of the company.

Blue Diamond’s North American Consumer Division supplies the cooperative’s branded products to consumers across North America, including all products from *Almond Breeze* to the BOLD flavored almonds. Conversely, *Blue Diamond’s* Global Ingredients Division team provides business

customers with almonds for their brand products, including everything from candy bars, trail mix and cereal.

“Every almond has a place in the ingredient world,” said Jeff Smith, Director of Industrial Marketing. “And we want to be the industry’s first choice for value-added almond ingredients.”

Both Smith and Maya Erwin, Snack Group Marketing Manager, gave presentations to the group, discussing the market for each separate division and where the industry’s future lies.

“*Blue Diamond* has experienced consecutive growth for 19 years, not many companies can say the same,” explained Erwin. “Innovation is critical, we are always thinking about the next big idea.”

For more information about the MASTERS program, contact your local field supervisor or the Membership office at (209) 545-6225.



The Class of 2016 visited the California State Capitol to discuss policy issues with legislators.



Young Leaders

Blue Diamond's Young Leader class of 2016 met in Sacramento in January to learn more about the cooperative's public affairs activities at the State Capitol and broaden their understanding of how *Blue Diamond* processes and markets their almonds with a tour of the Almond Innovation Center.

With the aid of the Agricultural Council of California and *Blue Diamond's* state advocate firm Niemela-Pappas and Associates, the group met with several state legislators, including Republican State Senator Andy Vidak from Hanford, Democratic Assemblymember Luis Alejo from Watsonville and Republican Assemblymember Kristin Olsen from Modesto. Secretary of Agriculture Karen Ross capped the event as the guest speaker for the dinner, commending the attendees for their "passion for their industry, willingness to work together and listen to different perspectives and viewpoints, and invest their time in getting involved to make their voices heard."

Participants learn the ins and outs of the Sacramento facility's processing capabilities and Almond Innovation Center.



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“This could be a game changer for honey bee colony health,” says Grass Valley beekeeper and biologist Randy Oliver. “Dr. Stephen Martin (Salford University, UK) may have hit the jackpot.”

What is all the excitement about?

Deformed Wing Virus and Varroa

Professor Martin and his team have recently published several articles in scientific journals with research, in part, funded by Project Apis m (PAm). Dr. Stephen Martin wrote recently in the *American Bee Journal* (November, 2015), “It is now becoming clear that the role of a small group of viral pathogens, especially Deformed Wing Virus (DWV), lies at the very heart of the Varroa problem.”

The Varroa mite, of course, is the number one pest of the honey bees that are so *important* to the pollination of California’s almond crop. The mite itself is dangerous enough, its offspring developing in honey bee brood and then growing up to pierce the exoskeleton of adult honey bees to feed off the honey bees’ hemolymph and possibly fat bodies as well. If that weren’t enough, the Varroa infects the bee with deadly viruses as well.

DWV is one of several viruses linked to Varroa mite infestations and is tied to winter colony mortality. While the disease can be found in colonies not infected with Varroa, it is generally more common and more damaging in colonies where mites are present. In heavily Varroa-infested colonies, almost all of adult workers may be infected with DWV and many will have the deformed wings typical of this virus.

To analyze the interaction between DWV and Varroa, Dr. Martin and his team traveled to a remote island in Brazil to study populations of European honey bees that appear to be resistant to Varroa. Varroa originally was a pest of the Asian honey bee, *Apis ceranae*, and jumped species to the European honey bee, *A. mellifera*, when *A. mellifera* was imported to Asia. Unlike Asian honey bees, European honey bees are not resistant to the Varroa mite - except for the anomaly in Brazil. On the Brazilian island, despite high Varroa mite levels in European honey bees (fluctuating seasonally between 2,000-5,000 mites during



⤴ Randy Oliver, a Grass Valley beekeeper and Project Apis m. scientific advisor, has been instrumental in supporting and sourcing funding for Dr. Stephen Martin’s landmark Deformed Wing Virus research.

the year without Varroa treatment), colonies are healthy with no reports of deformed wings or death due to DWV.

Dr. Martin used next-generation sequencing to define three variants of DWV. DWV type A, found to be the lethal variant, is most likely the culprit bringing down our honey bees in the U.S. When DWV type B, a non-lethal variant, becomes established in colonies, the lethal type A DWV variant will not persist. In other words, DWV type A leads to colony death, but there are no reports of type B being linked to colony death or type A occurrence when type B is present. Scientists are hoping to use this information about the host-pathogen relationship to develop an effective treatment that minimizes colony losses in the future.

The third variant is DWV type C, which appears to have diverged from type A and type B some time ago. At this

« Good honey bee nutrition, particularly diverse pollen sources, can help honey bees fight pests and pathogens like Varroa and Deformed Wing Virus



⚡ Honey bee with Deformed Wing Virus (photo by Rob Snyder, beeinformed.org)

point, we don't know a lot about the virulence of type C. Martin and his coworkers have found no synergistic effect between the widespread microsporidian parasite, *Nosema ceranae*, and Varroa. Understanding the variants of DWV and their interactions with other pathogens brings us one step closer to understanding the unsustainable colony losses beekeepers suffer. Further, is it too far-fetched to think that when bees are in California for almond pollination – and that's most of the nation's managed colonies – that we could inoculate them with DMV type B and thus prevent their demise by the virulent DMV type A?

Other virus-related research

We asked bee virus expert Dr. Michelle Flenniken from Montana State University to explain more about the relationship between Varroa, viruses and bee health, and she mentioned interesting recent studies that indicate the Varroa mite has altered the types of virus strains being transmitted to the honey bee. There is also research that draws a connection between agrochemical stress (for instance, exposure to neonicotinoids) and increased viral



Since most commercial colonies in the U.S. travel to pollinate California almonds, does the future hold some type of inoculation program before, during or after almond pollination for these colonies?

loads. Finally, there are studies that show that diverse pollen sources can improve immune function in bees and thus potentially mitigate the impact of viruses. It's painstaking work that Dr. Flenniken and her lab perform in Montana. Dr. Flenniken explains, "bee colonies harbor many potential pathogens, and knowing which pathogen or combination of pathogens kills a colony requires analysis of several samples collected from the same colonies at several points in time."

2016 marks the first decade of PAM's funding for honey bee research, and we are proud to say we've funded over \$4 million in research and programs to enhance the health of honey bees to improve crop pollination. Funding pest and disease prevention and control is a key area of focus. In fact, PAM spends a great deal of resources on Varroa and virus research. We've funded researchers and projects in the United States and around the world to study virus detection and diagnostics, virus control measures, virus interactions, and we've even funded research (with Dr. Flenniken) that discovered an entirely new and widespread family of viruses, the Lake Sinai Viruses.

There is still more work to do, but we are closer to understanding Varroa, viruses, pathogens and their interactions. Of course, we'd like to eliminate the Varroa mite. But meanwhile, working to control the pest and preventing the viruses they vector will continue to be a top honey bee research priority.

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Recognizing Agricultural Advocates – Daniel Bays

Daniel Bays has always known he would be a farmer, working with his father and grandfather on their family’s land near Patterson, on the west side of Stanislaus County. “It’s a pretty unique and special experience not many people get to do – spending quality time working with your dad and grandpa,” he said.

His path to farming was always clear to him. He explained it was what he grew up wanting to do. “It was always in the back of my mind that it would be nice to come back to the farm but it may not always be realistic or a good option depending on the circumstances,” he explained. “I was lucky with the way things panned out to be able to come back after school.”

After completing a bachelor’s degree in bioresource and agricultural engineering from Cal Poly San Luis Obispo, he assumed responsibility for day to day personnel management, equipment maintenance and operation, and part of the water management and irrigation scheduling duties on his family’s land. His degree has come in handy when it comes to managing irrigation schedules, increasing water efficiency and equipment maintenance. “In addition, I use the critical thinking and problem solving skills in everything,” he said.

Growing into a Leader

Bays has furthered his education by participating in numerous leadership programs – including *Blue Diamond’s* Young Leader Class of 2014, the Almond Board of California’s Almond Leadership Program, and most recently, with the California Farm Bureau’s Leadership program. “The programs have helped by giving me the opportunity to meet people outside of my local community and expand my network throughout the state and country,” he explained. “I have had research opportunities, been exposed to a variety of benefits available for growers and had the opportunity to be involved and grow as an industry leader. I hope by participating, I’m benefiting our own operation and the community as a whole.”

Bays caught the attention of *Blue Diamond’s* Corporate Communications and Public Affairs Director Alicia Rockwell through not only his participation in *Blue Diamond’s* Young Leader program, but also his participation in the statewide agricultural awareness campaign Cultivate California. “He is an excellent example of the next generation of almond growers looking to make a difference in our industry,” she said. Rockwell invited Bays to participate with her in a panel discussion on the benefits of leadership programs for cooperatives at the National Council of Farmer Cooperatives’ Annual Meeting.

“We discussed the importance of succession planning and helping to train the next generation to grow into director and leadership positions within cooperatives and commodity groups,” he explained. “I wasn’t sure what I would really have to offer to a corn grower from the Midwest but I think I was able to connect because there are commonalities that we all share as agriculturalists.”



Daniel Bays (left) farms with his father Ken and grandfather Gene.

About Daniel Bays

He is a third generation farmer from Patterson, CA

The Bays family grows: almonds, apricots, walnuts, processing tomatoes, lima beans, wheat and melons

His favorite *Blue Diamond* Product: Honey Roasted almonds and *Nut*Thins*

What are the most important issues in agriculture? “For California, it is definitely our resources – water, land and labor – and all of these are intertwined. On a larger scale, we need to foster an appreciation for and trust in the farmer that they have the consumers’ interest in mind and are doing the best with what they have.”

Becoming a Voice for Farming

The drought has brought increased attention on California farming from the media and general public. Bays took it upon himself to try to educate the public on the realities of farm life. “I try to show them the human element of farming, the farmers. We’re humans who depend on farming as an industry for a paycheck and a living, but there’s a lot of employees in service industries that depend on almonds and apricots and the various crops that we grow in California to support their own families,” he explained.

“I also want them to leave with an understanding that we do our best to use our resources efficiently. Occasionally I do have to take a step back and do some basic education as far as all food takes water and soil to grow and there’s a cost associated with that,” he said. “It’s a lot more than planting a seed, kicking back and letting it grow on its own, and then coming back six or nine months later. It’s really more science, praying, hard work and sweat that goes into it.”

Mel Machado, Director of Member Relations for *Blue Diamond*, has known Bays since he was a high school student and has seen him grow into a capable industry representative. “Daniel is a wonderful spokesman for agriculture in general and the almond community, in particular,” he said. “He’s an absolute pleasure to be around and a joy to work with.”

With Hard Work Comes Recognition

Bays was recently awarded the California Farm Bureau Federation’s Achievement Award, an honor recognizing the operating efficiency of young farmers and ranchers based on leadership, creativity and proven success. “It feels nice to be recognized but a little embarrassing because there are many other deserving individuals out there as well,” he said, humbly.

“Hopefully it provides inspiration or interest to someone else who is up and coming and shows them there are opportunities out there for an individual to get involved and grow. Hopefully, it also shows the older generation that there is an interest from the younger generation to carry on the tradition of farming.”

As the award winner, Bays represented California at the American Farm Bureau

Federation Annual Meeting, an experience he greatly enjoyed. “There are many differences between a peanut farmer in Georgia, a vegetable farmer from Michigan, a corn farmer from the Midwest and a tree and nut farmer from California but there are also some issues that we can all share a common interest in, as we all care for the land and have an appreciation for the job we do to feed the world.”

Learn more about connecting consumers with growers at www.CultivateCalifornia.com and view the Bays Farm profile under Cultivators. Also, follow on Twitter and Instagram @CultivateCA #CAonMyPlate.

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Time To Consider

DAVID DOLL, UCCE Nut Crop Pomology Advisor

The spring time months of March and April present many challenges in managing almonds. Irrigation, nutrient applications, disease management, and weed and insect control begin during this period and are critical for developing a successful crop.

Spring-time Nitrogen Management

Nitrogen applications tend to begin in mid to late March for many operations. New nitrogen regulations require a crop estimate in order to determine the seasonal amount of nitrogen to apply. Crop removal studies have indicated that around 65 pounds of nitrogen are removed with every 1000 kernel pounds of harvest. Taking into account nitrogen application inefficiencies, 85 pounds of nitrogen must be applied to replace the removed amount.

Further research has indicated that multiple applications of nitrogen should be made through the season with 80 percent of the total budget being applied prior to kernel fill and the remaining 20 percent applied in the postharvest period. Spring applications should be split to reduce the potential of plant toxicity and leaching from spring rains or over-irrigation. A good plan for a sandy loam or finer soil would be 20-30-30-20 for mid-March, mid-April, mid-May, and the postharvest period, respectively. In coarser or soils with lower water holding capacities, smaller, more frequent applications should be applied. Keep in mind that if reducing water applications due to water shortages, nitrogen applications should also be reduced.

Pest and disease considerations for March/April

Disease concerns tend to run high in the spring as rains may provide environmental conditions conducive for infection. Sprays for shot-hole, anthracnose, jacket rot and bacterial spot should be based on rainfall events. Summer diseases of rust and scab, however, may still be problematic and may require a treatment even in dry spring conditions. Treatment timings for scab is two to five weeks post petal fall, and five weeks post petal fall or later for rust.

Anthracnose and bacterial spot proliferate in warm, rainy weather and may require multiple treatments prior to rainfall events. Bacterial spot treatments involve copper and mancozeb treatments and should be considered in

orchards that have a history of disease. Please discuss the usage of copper with your PCA or Farm Advisor as almonds are sensitive to this element. Orchard history, cultivar and irrigation systems should be factors in determining the need for treatment. More information can be found at the UCIPM website or in the January/February *Time to Consider* column's inserts.

Insect concerns include San Jose Scale (SJS), Peach Twig Borer (PTB) and Leaf-footed Plant Bug (LPB). With the warmer spring, male emergence for SJS and the biofix for PTB will be earlier. Therefore, the traditional "May Spray" timing may also be earlier. Timing of a growth regulator for SJS control should be 400 DD after the male flight. A spring treatment for PTB should be made 400-500 DD after the biofix. Keep in mind that the PTB timing often overlaps with the spring flight of NOW. If timed properly, this spray could provide early season control for both pests.

LPB is erratic and hard to predict. Research does suggest that over-wintering populations are reduced by below freezing temperatures. In years with mild winters, such as this past year, populations tend to be higher. Sprays should be timed once adults are first detected, not once damage occurs. Damaged nuts do not show symptoms for several days to weeks after initial feeding.

Please keep in mind that there are more pests that affect almonds during this time period. More information can be found at www.ucipm.ucdavis.edu.

Weed control

Most spring time weed control programs are reliant on post-emergent herbicides, particularly glyphosate. These products should be properly selected to provide control of the "escaped" weeds from the winter pre-emergent program. Over the past several years, however, we have seen an increase in summer emerging weeds that are either glyphosate-resistant or have variably control with this herbicide (e.g. lambsquarter, threespike goosegrass, and junglerice). If present, alternative broadspectrum "burn-down" products such as glufosinate or paraquat are

Too wet of soils can kill fine feeder roots, which leads to the expression of nutrient deficiencies and a yellow color. Before applying fertilizer, check to see if the soil is too wet.



available. Alternatively, a “two shot” pre-emergent program could also be considered to stretch residual weed control into the summer.

If a spring applied pre-emergent product is used, it must be applied when there is enough rain or irrigation to aid in its incorporation. This may mean that it is applied with the last rains of the spring or in microsprinkler or solid-set irrigation systems. The highest label rate may not be needed in order to provide effective control at this time of year which may help with the costs. More information can be found on the IPM webpage under weed management.

Be careful with post-emergent herbicide spray applications. Winds tend to be variable in the spring which makes it difficult to apply material in a timely fashion. Calibrate equipment, check nozzle orientation and overlaps, and replace nozzles as needed to help maintain proper spray particle size to maximize coverage and minimize drift. Utilize surfactants, water conditioners and drift control agents to increase efficacy. Be cautious when spraying around young trees as some herbicides can cause damage. Generally, I suggest that spring herbicide applications be made before cartons are removed from two year old trees.



⤴ Anthracnose can be a problematic spring-time disease. Warm, spring rains can create environmental conditions conducive for disease. The variety “Monterey” is highly susceptible to this disease.

Irrigation timing/Saturated Soils

Annually, several calls regarding poor tree growth and “pale trees” are received. This is often due to saturated soils. Too wet of soils reduces the movement of oxygen into the soil, killing fine feeder roots. This impacts the ability for the tree to uptake water and nutrients, leading to micro-nutrient deficiencies, impacting nut set and tree growth. Later-season effects are also observed and include a limited rootzone, leading to severe water stress during hull-split and harvest. The problem is often compounded by fertigation or chemigation in attempts to manage the symptoms. Often, however, it is best to make sure the soil profile is beginning to dry before applying water. This can be determined with the use of a shovel or auger, pressure chamber, or soil moisture sensors. If using the pressure chamber, irrigation should be considered if trees are 1.5-2 bars more negative than baseline.

Importance of Irrigation

Irrigation is the most important practice within the farm operation. This is due to the close relationship between water applications and yield. Preliminary data from regional water trials suggests that yield is a linear response to water applications with a 1:1 relationship until 85 percent of the calculated almond evapotranspirational demand (ET) is applied. Although there is some debate in methodology, all agree that water should be applied to match the tree’s usage. ET_c should be calculated using real time weather, if possible. Thirty year average ET_c values can be used, but they tend to vary significantly in the spring and don’t account for rainy or cool periods. Summer values, however, are more consistent. Once the demand is calculated, water should be applied to match the tree’s demand without overfilling the water holding capacity of the wetted area of the field. More on scheduling irrigation can be found at your local extension office.

Irrigation system maintenance

Within five years, most irrigation systems are not distributing water to the standards in which they were designed. This loss of distribution uniformity can be due to many issues, but generally is a result of poor maintenance. Micro-systems should be evaluated and tuned-up in the spring before the water use increases in the summer. When performing irrigation system maintenance, consider the following:

- Check the emitter types within the field. Are all of them the same? Clogged or broken emitters may have been replaced with a different flow rate.
- Clean the filter station. Check the various filters to see if they need cleaning. This is more commonly done with screen and disk filters as they tend to clog up. Sand media filters require maintenance too. Check the sand levels and algae build-up, flush and refill as needed.
- Check the pressure regulators in the field. Are they working properly?
- Check hose screens. Clogged screens can cause significant pressure drops. They need to be cleaned every two to three weeks. Consider replacing them with washers if not wanting to perform the maintenance.
- Flush hoses and check for mud, algae and slime. Hoses should remain open until the water runs clean for 10-15 seconds. If slime or algae is found, consider injecting some type of sanitizer.
- Check individual, random emitters for flow rate. Perform a catch-can test from 40 different emitters across the field. If the average flow is 10 percent different than the designed specifications, consider installing new emitters.

Remember, the system is only as good as the maintenance that is performed.

Final thought

The past few years have provided support to the belief that irrigation and water management is about 80 percent of the “game.” Water management, however, isn’t as simple as “flipping a switch.” Operations that are successful in achieving consistent, high yields are spending about 60 to 80 percent of their effort in managing their irrigation system and applications. This includes taking soil, weather and water quality variability into account. If yields aren’t at levels that you are expecting, consider spending time reviewing your irrigation scheduling, soil types within your fields, and system performance.

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Irrigation system- 1. New 4 stage bowl assembly for 8" pipe with 140' of oil tube shaft, 2. 90 hp gear head, new bearings, 6:5 ratio, 3. Rebuilt Ford 300 cu in. Industrial propane engine, mounted on frame with clutch assembly and drive line, Total price \$8900. Will sell all or part.
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2004 Jackrabbit Reservoir Cart HP335 with Unloader and Augers - \$15,000
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Jackrabbit 20-20 Elevator with diesel engine - \$17,500
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Fax: (916) 325-2880

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GROWER STATISTICS

Colusa County **Arbuckle**

124 trees per acre
Third Leaf
1,200 lbs/acre
Fourth Leaf
1,700 lbs/acre
Fifth Leaf
2,800 lbs/acre

Stanislaus County **Westley**

124 trees per acre
Fourth Leaf
2,000 lbs/acre
Fifth Leaf
2,100 lbs/acre
Sixth Leaf
2,950 lbs/acre
Seventh Leaf
3,500 lbs/acre

Fresno County **Fresno**

124 trees per acre
Third Leaf
1,350 lbs/acre
Fourth Leaf
2,448 lbs/acre
Fifth Leaf
3,073 lbs/acre
Sixth Leaf
4,100 lbs/acre
Seventh Leaf
3,550 lbs/acre

Sutter County **Yuba City**

152 trees per acre
Third Leaf
600 lbs/acre

San Joaquin County **Ripon**

136 trees per acre
Third Leaf
680 lbs/acre
Fourth Leaf
2,100 lbs/acre
Fifth Leaf
2,600 lbs/acre
Sixth Leaf
3,100 lbs/acre
Seventh Leaf
3,500 lbs/acre

Stanislaus County **Modesto**

110 trees per acre
Third Leaf
730 lbs/acre
Fourth Leaf
2,030 lbs/acre
Seventh Leaf
2,500 lbs/acre
Eighth Leaf
3,100 lbs/acre
Ninth Leaf
3,500 lbs/acre

San Joaquin County **Vernalis**

121 trees per acre
Third Leaf
1,800 lbs/acre
Fourth Leaf
2,050 lbs/acre
Fifth Leaf
2,100 lbs/acre

Stanislaus County **Turlock**

124 trees per acre
Third Leaf
625 lbs/acre
Fourth Leaf
1,605 lbs/acre
Fifth Leaf
2,300 lbs/acre

Merced County **Ballico**

110 trees per acre
Seventh Leaf
3,000 lbs/acre
Eighth Leaf
3,300 lbs/acre
Ninth Leaf
2,600 lbs/acre

Merced County **Gustine**

110 trees per acre
Third Leaf
1,425 lbs/acre

San Joaquin County **Farmington**

121 trees per acre
Third Leaf
630 lbs/acre
Fourth leaf
1,300 lbs/acre
Fifth leaf
2,200 lbs/acre
Sixth leaf
3,000 lbs/acre
Seventh leaf
3,500 lbs/acre

Stanislaus County **Hughson**

156 trees per acre
Third Leaf
1,390 lbs/acre
Fourth Leaf
2,820 lbs/acre
Fifth Leaf
2,840 lbs/acre
Sixth Leaf
4,400 lbs/acre
Seventh Leaf
4,766 lbs/acre

Stanislaus County **Patterson**

156 trees per acre
Third Leaf
1,300 lbs/acre

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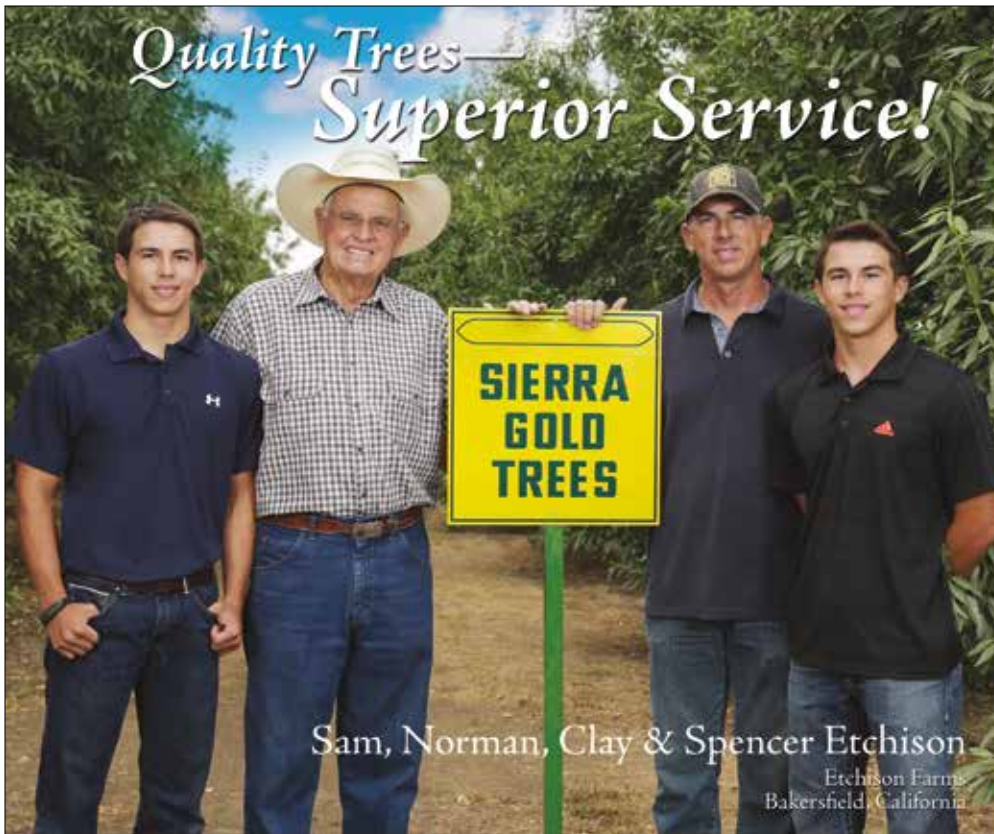
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