



almond facts

NEWS, VIEWS, AND INDUSTRY INSIGHT

SEPTEMBER–OCTOBER 2022



This holiday season, we're getting rid of the "or" as we embrace Naughty AND Nice!

Final Crop Return

Blue Diamond Receives
\$45M USDA Grant

Harvest is Over.
Now What?

Blue Diamond's 112th Annual Meeting

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Each crop year brings its own challenges and opportunities, and little with the 2021 crop year was predictable or ordinary. Let's take a look at the final crop return of 2021.

22 NEW Holiday Flavors: Naughty & Nice

Our two new holiday flavors: Snickerdoodle and Peppermint Cocoa are a little bit naughty but a whole lot of nice! Available at many local grocery stores this season, while supplies last!

30 Blue Diamond Awarded \$45M USDA Grant

This September, Blue Diamond was awarded \$45 million in funds provided by the USDA as part of a massive climate protection partnership activation.

34 Harvest is Over. Now What?

Autumn is a time when things slow down in the orchards. Some may still be harvesting, but soon, they will be able to reflect on the year and prepare for the next. To have a successful 2023 harvest, you have set the foundation today. Let's consider the seven factors needed to start the new year off right.

ON THE COVER:

This season grab both Snickerdoodle and Peppermint Cocoa. One for you and one to share. Or, just both for you!



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Blue Diamond, the world's largest processor and marketer of almonds, exports to over 100 countries.

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Mark Jansen
President & CEO



2021 Final Crop Return

Each crop year brings its own challenges and opportunities, and little with the 2021 crop year was predictable or ordinary!

As many of you experienced, it began with an unexpected freeze during a critical point of the bloom. What's more, throughout the season, ongoing supply chain issues, complications with shipping, and soaring inflation that drove increased production costs plagued all segments of the industry. It was certainly a challenging year for all of California agriculture. Yet, together, our 112-year-old *Blue Diamond Growers* cooperative rose to the challenge as only we can, and delivered a superior 2021 crop return to members, as reflected in the table (below).

Variety	Overall Average	Average of High Quality	Maximum Possible
Nonpareil & Sonora Inshell	\$2.39	\$2.41	\$2.44
Nonpareil /Supareil Meats	\$2.20	\$2.24	\$2.30
Sonora Meats	\$2.04	\$2.10	\$2.15
Independence Inshell	\$2.00	\$2.02	\$2.03
Independence Meats	\$1.86	\$1.88	\$1.90
Carmel & Winters	\$1.89	\$1.91	\$1.95
Monterey /Neplus	\$1.86	\$1.89	\$1.94
California /Price /Fritz /Wood Colony	\$1.89	\$1.91	\$1.94
Butte & Padre	\$1.90	\$1.91	\$1.94
Mission	\$1.78	\$1.82	\$1.85

Note: The above rates do not include Volume Premiums, Sustainability Incentives, Domestic Production Activities Deduction (DPAD) or IC-DISC advantages.

Please note the rates displayed do not include Volume Premiums, Sustainability Incentives, Domestic Production Activities Deduction (DPAD) or IC-DISC advantages which need to be added in. Your actual crop earnings are shown in the box on the last page of your personal grower's statement.

We are once again proud to deliver *Blue Diamond's* return at a record competitive advantage to other handlers in the industry. It's clear to me, and I hope to each of you, that every *Blue Diamond* team member feels a personal connection to you, our growers, and a commitment to our co-op's overall mission to maximize your returns.

But as I mentioned in my letter that was included with your 2021 Patronage Dividend, our responsibility to our growers goes far beyond profitably marketing each year's crop. Two recent developments offer prime examples of the advocacy and "Power in Partnership" that our *Blue Diamond* co-op contributes to its members and California's almond industry as a whole.

In June, to address the ongoing logistical challenges that were inhibiting the movement of almonds to markets around the world, our *Blue Diamond* team leaned in to find an innovative solution. Partnering with the Almond Alliance, government, and shipping industry

representatives, we created an "Almond Express" rail link to U.S. ports to ensure more efficient and timely movement of almonds to our customers around the globe.

Last month *Blue Diamond Growers* was awarded \$45 million from the U.S. Department of Agriculture as part of a historic climate protection initiative. Working with our partners *Project Apis m.* and Pollinator Partnership, these grants will help amplify and expand the great sustainability work already being done in your orchards. I hope you agree it's quite an honor to have been selected as one of 70 partners out of 450 proposals submitted to the USDA for this first round of funding. Our faith in each other and in our future is the secret to our success as a co-op. After two years of virtual meetings, I look forward to celebrating in person our collective achievements for our sustainable future on November 16 at *Blue Diamond's* 112th Annual Meeting at the Modesto Centre Plaza. Best of luck with the rest of your harvest activities. See you soon! ♦



Mark Jansen
President & CEO



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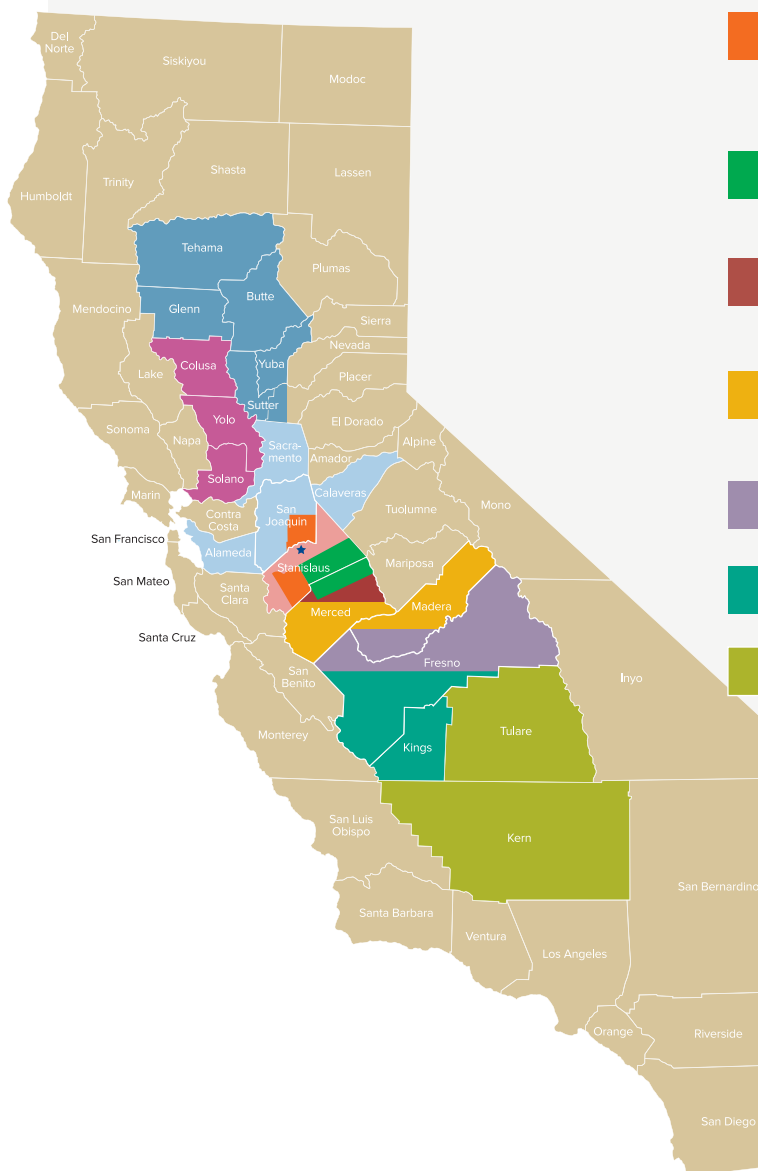
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 Luke Konyon
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 Brian Erickson
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 Jerry Montz
 Steve Carlos
 Fred Montgomery
 Daniel Varner **VC**
 Greg Overton
 Darcy Jones **!**
 Dan Cummings ******
 W. Howard Isom *****

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 Joe Martinez
 Sarah Pippitt
 Maryann Warmerdam
 Don Bransford
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 Brian Cahill
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 Jake Spooner
 Amy Abele **!**
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 Elaine Rominger *****
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 Allen Sipma
 Bert Van Ryn
 Rudy Mussi
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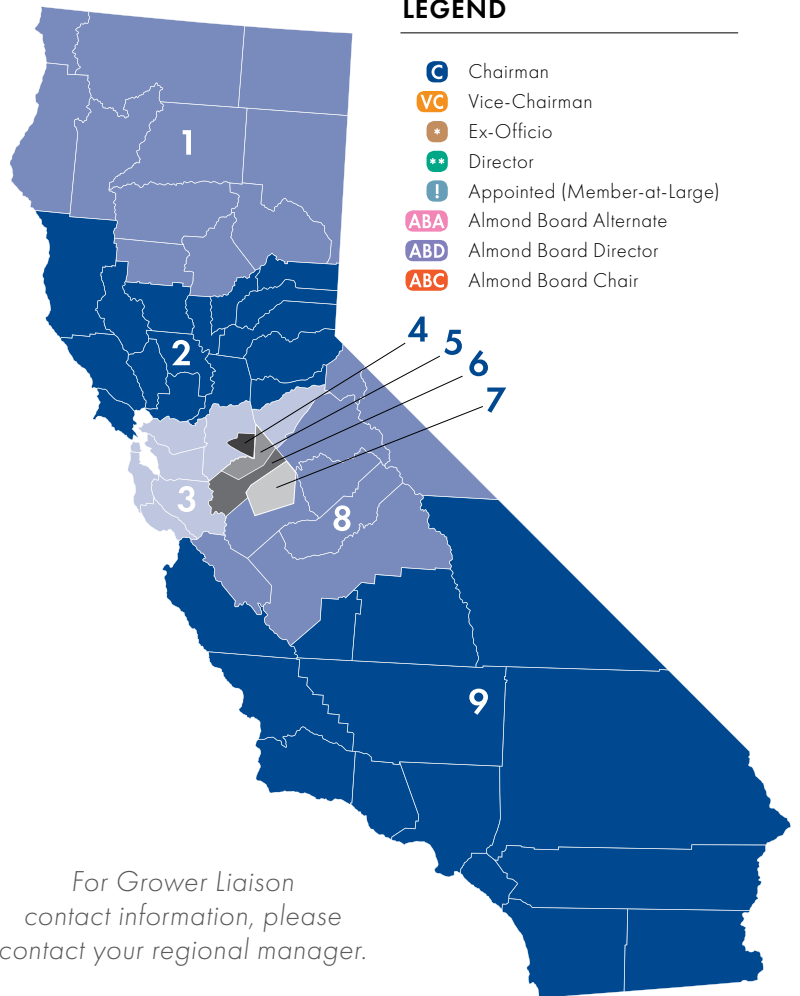
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 Lisa Marroquin **!**
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 Clinton Shick *****

LEGEND

- C** Chairman
- VC** Vice-Chairman
- *** Ex-Officio
- **** Director
- !** Appointed (Member-at-Large)
- ABA** Almond Board Alternate
- ABD** Almond Board Director
- ABC** Almond Board Chair



For Grower Liaison
 contact information, please
 contact your regional manager.

Four Special Podcasts for Almond Growers!

Almond growers now have four convenient ways to stay up to date on key issues regarding ag and almonds. The resources are provided by *Blue Diamond Growers*, Almond Board of California, Almond Alliance, and Ag Council.



The Blue Diamond Almond Podcast: Grown in California

Stay up to date on current trends and the future of almonds and almond ingredients. CJ McClellan, Senior Manager of Strategic Marketing, and Loretta Kelly, Director of Strategic Marketing, interview industry experts and *Blue Diamond* thought leaders to bring you applied almond expertise and valuable insights you won't find anywhere else. Listen on Spotify, Apple Podcasts, or Google Podcasts.



The Almond Board of California: Almond Essentials

This three-part series explores the latest research from ABC, sustainable farming practices and almond recipe inspiration. All episodes available here: almonds.com/why-almonds/almond-living-magazine/almond-essentials-podcast-series



Almond Alliance: Almond Alert

Almond Alert is the Almond Alliance's new bi-monthly podcast bringing new thoughts, thinkers, ideas, and information to the almond community worldwide. Almond Alert aims to bring big and different ideas and influencers to members, the market, and more so we can continue to lead, innovate, and act. Almond Alert is now available on Spotify, Amazon, Apple Podcasts, and Google Podcasts, or you can view it on YouTube.



Ag Council: Almond Journey

This podcast explores how almond growers, handlers, and other stakeholders are making things work in their operations to drive the industry forward. Episode 27 (August 2) on brown spot featured *Blue Diamond's* VP of Member Relations, Mel Machado. Listen on Apple Podcasts or Spotify. ♦

Blue Diamond Leadership Program Class of 2023 Applications Due October 14!

The *Blue Diamond* Leadership Program (previously known as Young Leaders) **is encouraging all interested applicants to apply.** The Leadership Program is designed to prepare the participants for a leadership role in the almond industry by:

- Developing communication and leadership skills
- Familiarizing the participants with the structure and operations of *Blue Diamond Growers*
- Developing an awareness of the advantages of *Blue Diamond* membership
- Meeting and becoming acquainted with other almond growers
- Encouraging participation in *Blue Diamond* activities
- Assisting participants in the development and operation of a successful farming business
- Familiarizing participants with the external factors that affect their business

The Leadership Program consists of three in-person gatherings in 2023: January 12–13 (Sacramento), June 22–23 (Salida), and November 14 (Modesto). Completion of the program requires attendance at all three sessions.

Please scan the QR code below or utilize the online application link to apply! Reach out to your Field Supervisor if you have any questions about the Leadership Program.

Participant selections for the **2023 Leadership Program** will be made by a committee consisting of the local Board member, Advisory/Liaison Committee members, and the Field Supervisor representing your district.

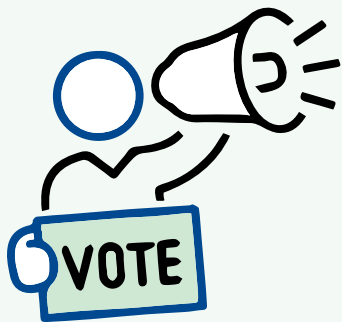
If you are interested, please submit your application by **October 14, 2022!** ♦

To apply, please complete the application via this link:

forms.monday.com/forms/32d3ecf3b7eadc575b65579eb13a8df2?r=use1

Or scan the QR code with your smartphone:





Annual General Election

It is time once again for the *Blue Diamond* annual general elections. This is a great opportunity for you to exercise one of your fundamental rights as a voting member to shape the future of your *Blue Diamond Growers* cooperative: electing members of the Board of Directors and Grower Liaison Committees. This year, you have the opportunity to vote for District Directors in districts 2, 8 and 9. You also have the opportunity to vote for Grower Liaisons in each of the nine districts.

Ballots will be mailed the week of October 10 to voting members with voting will close on **November 4, 2022**. Only ballots received by this date will be counted. **Your vote matters!** Be sure to submit your ballot in plenty of time so your vote is received before this deadline.

How to Vote.

There are three ways to vote: paper ballot, online or by phone. Your election packet will include the paper ballot, return envelope, and instructions for online and phone voting.

1 PAPER BALLOT



2 ONLINE



3 BY PHONE



Don't forget to return the Proxy Card!

In addition to the ballot, you will receive a Proxy Card. This card gives you the opportunity to assign your vote to another voting member of the cooperative. Just as importantly, it also ensures you are counted at the annual meeting, even if you are unable to attend. Why does this matter? In order to hold the annual meeting, there must be a required minimum number of members present in person, virtually or by proxy (this is called having a quorum). If you are unable to attend the meeting yourself, you can designate a proxy who will represent you at the meeting. ♦



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#WeAreBlueDiamond Social Media Activity



This past month, *Blue Diamond* remembered all the fallen citizens who were lost in the 9/11 tragedy. We hosted a booth and handed out lots of almond samples at Legends of Wine, and the Farm to Fork Festival. We celebrated a massive win; our cooperative being selected to receive \$45MM grant from USDA. We enjoyed the harvest shake while saying “farewell” to our wonderful, summer interns who spent the past few months with us on several meaningful projects. ◆





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BLUE DIAMOND INVESTMENT PROGRAMS

Current Investment Rates available as of October 1, 2022

Blue Diamond Growers offers members short-term and long-term investment programs.

The objective of these programs is to serve as a competitive investment alternative for our members and provide *Blue Diamond Growers* with a steady source of funds. The interest rates effective October 1, 2022, for the program are listed here:

	Short-Term Investment Certificate (STIC)	Long-Term Investment Certificate (LTIC) (Maturity Date of 6/30/2025)
Initial Investment Required	\$1,000	\$50,000
Interest Rate	4.00%	2.95%
	(Variable, subject to change)	(Fixed rate)

For more information, contact your local Regional Manager, or Member Services at (209) 545-6225.

This summary does not constitute an offer to sell or a solicitation to purchase investment certificates. We will provide a package of documents for the programs to those members who are California residents and who express an interest in participating in the program.

Baked Apple Donuts

Prep Time: 15 minutes Cooking Time: 15 minutes Difficulty: Easy Servings: 6

Ingredients

Donuts

- 1 cup apple sauce
- ⅓ cup butter
- 1 egg white
- ½ cup sugar
- 1 teaspoon cinnamon
- 1 tablespoon vanilla
- ¼ teaspoon salt
- 1½ cups *Blue Diamond* Almond Flour
- ½ cup *Blue Diamond* gluten-free flour blend (*see recipe to the right*)
- 1 teaspoon baking soda

Caramel Glaze

- ¼ cup almond butter
- ¼ cup honey
- 1 teaspoon vanilla
- ⅓ cup butter

Directions

1. Preheat oven to 350°F.
2. Place apple sauce, butter, egg white, sugar, cinnamon, vanilla and salt into a mixer and blend until well combined.
3. Mix together almond flour and gluten-free flour blend. Slowly add to wet ingredients inside of the mixer. Mix for 2 minutes.
4. Turn off mixer and hand mix in baking soda.

5. Butter donut pans and fill to rim with batter. Bake for 15 minutes.

6. Allow to fully cool before dipping into caramel sauce.

7. In a microwave-safe bowl wider than the width of the donuts, add all ingredients for caramel glaze. Microwave for 2 minutes, stopping and stirring every 30 seconds until smooth.

8. Dip donuts into caramel and top with favorite toppings.

Gluten-Free Flour Blend:

- 2 cups brown rice flour
- 2 cups white rice flour
- 2 cups tapioca flour
- 1 cup corn starch
- ¼ tablespoon xanthan gum

Simply sift all ingredients together thoroughly and store any amount you do not use in an airtight container. The gluten-free flour blend keeps in the fridge for up to three months or in the freezer for up to six months. Just remember to bring the measurement of flour you want to use up to room temperature before baking for optimum texture and consistency.



Pumpkin Cinnamon Buns with Cream Cheese Frosting

Prep Time: 2 hours 20 minutes

Cooking Time: 2 hours 20 minutes

Difficulty: Hard Servings: 12



Ingredients

Rolls

- ¼ cup unsalted butter
- 2¼ teaspoons dry active yeast (1 packet)
- ¾ cup *Almond Breeze* Unsweetened Original Almondmilk warmed to 110°F
- ½ teaspoon granulated sugar
- 3 cups bread flour
- 2 tablespoons dark brown sugar
- 1½ teaspoons cinnamon
- ¼ teaspoon ground ginger
- Pinch of nutmeg
- Pinch of cloves
- ½ teaspoon salt
- 1 egg
- ½ cup pumpkin puree
- ¼ cup butter softened
- ⅔ cup packed dark brown sugar
- 2 tablespoons cinnamon
- Extra flour for dusting

Frosting

- 4 oz light plain cream cheese
- ½ cup powdered sugar
- ½ teaspoon vanilla
- ¼ teaspoon cinnamon
- 2 teaspoons *Almond Breeze* Unsweetened Original

Directions

1. Place butter in small sauce pan over medium-high heat. Butter will begin to melt, foam, and crackle. Whisk continuously until butter begins to brown and smell similar to caramel. Immediately remove from heat and transfer to a bowl to cool for a few minutes while you make the dough.
2. In bowl, add warm unsweetened almond milk, yeast, and granulated sugar. Let sit for 5 minutes to activate the yeast. While the yeast is activating, whisk together flour, brown sugar, cinnamon, nutmeg, cloves, and salt together in a large bowl.
3. Once the milk is a bit foamy from the yeast add in ½ of the flour mixture, along with the pumpkin puree, egg, and cooled brown butter; stir with a wooden spoon until just combined. Then add in the rest of the flour and stir again until just combined. Place dough hook on your electric mixer and run on medium-low speed for about 8 minutes. Alternatively, you can knead the dough by hand for about 10 minutes.
4. Grease a large bowl with oil or cooking spray. Add dough and turn over, making sure to coat it all with the oil. Cover with plastic wrap and a towel, then place in a warm place to rise for about 1½ hours or until doubled in size.
5. In a small bowl, combine the filling ingredients: ¼ cup softened butter, brown sugar and cinnamon. Once dough has doubled in size, place onto a large surface dusted with flour. Punch dough down and roll into a 15x9 inch rectangle. Spread butter and cinnamon sugar mixture over the dough leaving a ½ inch border. Beginning at the 15-inch side, roll up tightly and pinch edges together to seal. Using a serrated knife, gently cut into 12 slices.
6. Generously grease the bottom of a 9x13 inch pan or 8x11 with butter or cooking spray. Place cinnamon roll slices in pan, cover with plastic wrap and let rise again for 30–45 minutes or until dough doubles in size. At this point you can decide if you want to bake them now or later. If later, stick them in the refrigerator overnight (covered well). When you are ready to bake the rolls, simply take them out 30 minutes prior to baking and bring to room temperature.
7. To bake, preheat oven to 350°F. Bake for 20–25 minutes or until barely golden brown. Cool for 5–10 minutes. While cooling, make the frosting by combining cream cheese, powdered sugar, *Almond Breeze* Unsweetened Original, vanilla, and cinnamon in a medium bowl. Spread evenly over warm rolls. Enjoy!

This Holiday Season, *Blue Diamond* is Both Naughty and Nice

Nobody is all naughty or all nice; we're all a bit of both! Maybe you'll see both sides come out when you indulge in *Blue Diamond*'s new Snickerdoodle and Peppermint Cocoa flavored almonds. Available this October, make sure you don't wait to grab these tasty, holiday flavors. Get them before they're gone! The big question is, once both flavors are in your cart, will you keep one for yourself and scribble a friend's name on the lid of the other, or will both stay tucked in that secret corner of your pantry no one else knows

about? Whatever you decide, we know that Santa understands and will keep your name in good standing on his list. You may even find a can of Snickerdoodle or Peppermint Cocoa Almonds in your stocking.



Blue Diamond Snickerdoodle Almonds deliver a burst of sweet cinnamon and a taste of the delightful seasonal flavor you love on a superfood snack.

*Snickerdoodle flavored treats grew 30% from 2020 to 2021!

**84% awareness and 67% trial of Snickerdoodle flavors among young adults

Blue Diamond Peppermint Cocoa Almonds are inspired by winter's favorite beverage and sure to indulge your sweet tooth with a delicious chocolatey flavor and a hint of peppermint.

*Peppermint is a top established flavor related to hot cocoa and is experiencing growth. Chocolate & Peppermint flavors grew 37% from 2020 to 2021!

What makes these flavors even sweeter is that, during a season famous for holiday parties filled with baked treats and sugary drinks, you can "indulge" in *Blue Diamond*'s Naughty & Nice almonds and still walk away knowing that a superfood is hidden beneath the decadent, sweet wrapping.

The flavors were crafted to perfection by the fantastic *Blue Diamond* research and development team. The sales and marketing teams had nearly one million cans pre-ordered by stores in the most collaborative campaign ever launched. Our supply chain team managed pre-orders to be shipped and marketed with precision while the operations and finance teams worked to produce and support the campaign. This massive team effort landed everyone a place on Santa's nice list.





INTRODUCING NEW!

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superfood snack

BLUE DIAMOND PEPPERMINT COCOA ALMONDS

are inspired by
winter's favorite beverage and sure
to indulge your sweet tooth with a
delicious chocolatey flavor and
a hint of peppermint



Availability:

Available at retailers
nationwide from October
through December 2022



Where can you find Naughty & Nice Flavors?

You'll find our limited time flavors in our Nut & Gift Shops, your local grocery story, and on Amazon this October.

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*Ingredients and Flavor for Hot Cocoa; Source: Mintel 1/23/2022

**National Restaurant News; Source: Dataessential 9/13/2022



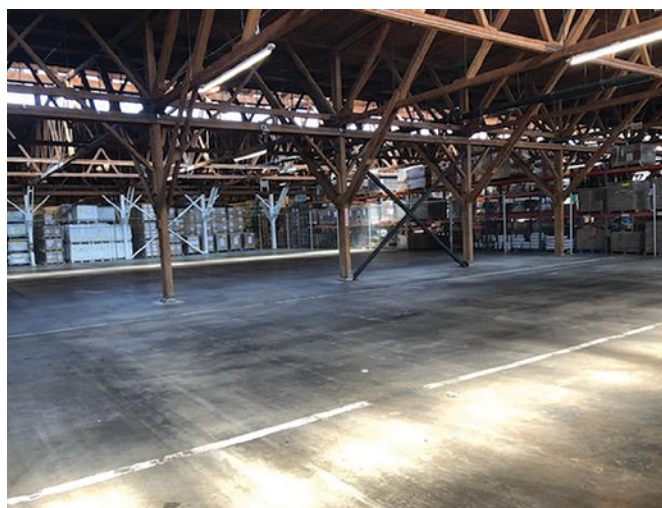
Blue Diamond's Sacramento Campus Welcomes Amazon Vendor Flex

An innovative new program rolled out at the Sacramento campus in the middle of September.

Because Amazon is one of the fastest growing priority customers for *Blue Diamond*, we are partnering with the online retail giant on a unique Supply Chain initiative called the Amazon Vendor Flex Program. Through this program, Amazon embeds itself into our warehouse to create efficiencies and a more flexible supply chain.

In September, Amazon and *Blue Diamond* supply chain teams collaborated to, essentially, stand up a mini Amazon store room within *Blue Diamond's* warehouse at 16th and C Streets on the Sacramento campus. The dedicated warehouse space, staffed by Amazon employees, will allow Amazon to conveniently package and ship *Blue Diamond* products directly to Amazon customers from the facility.

As a result, both Amazon and *Blue Diamond* will realize significant efficiencies in our outsourced third-party logistics network, along with cost savings from reduced transportation costs and better inventory control. We continue to look for ways to improve our competitive advantage and these savings will ultimately be passed on to our growers through greater returns. What's more, the reduced greenhouse gas emissions achieved by eliminating transit trips supports *Blue Diamond's* commitment to sustainability. ♦





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Connecting the Orchard to the Aisle

This summer, *Blue Diamond* hosted Marcos Helou and his family. Helou is the owner of Bela Vista, *Blue Diamond*'s licensee partner in Brazil. *Blue Diamond* grower, Galen Miyamoto, is featured on the packaging in Brazil, so what better way to strengthen Helou's connection than to visit the Miyamoto home? The two families talked and tasted all things almond, walked the Miyamoto orchards, and snapped a photo to commemorate this very special gathering of two leaders representing *Almond Breeze* from orchard to aisle.

The guests also met with Mark Jansen, president and CEO, and Mel Machado, vice president of member relations. They visited the Sacramento and Turlock plants as well as the Almond Innovation Center. The Helou family was accompanied by *Blue Diamond*'s managing director of Latin America and Caribbean, Edgar Ebel and Brazil country manager, Ricardo Ebel throughout their visit. ♦

People in photos (left to right)



Location: Miyamoto home. Photo credit: Ricardo Ebel
Galen Miyamoto and Marcos Helou in the Miyamoto home



Location: Turlock Plant. Photo credit: Ashley Logsdon
Ricardo Ebel, Christiane Helou, Leonardo Helou, Marcos Helou, Edgar Fernandes, Ashley Logsdon, Christine Lott



Location: Lunch meeting. Photo credit: Ashley Logsdon
Ricardo Ebel, Ashley Logsdon, Mel Machado, Edgar Fernandes, Mark Jansen, Marcos Helou, Christiane Helou, Leonardo Helou, Christine Lott



Location: Sacramento Plant. Photo credit: Ashley Logsdon
Doug Crabtree, Christiane Helou, Marcos Helou, Ricardo Ebel, Marcos Helou, Edgar Fernandes

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End of Session, New Beginnings, and a Lot of Interpretation

In the last week alone, there were over 1,000 bills dispensed in the California State Senate and Assembly. Yes, 1,000.

Even high-ranking state officials expressed their frustration with the amount of legislative business left to the last minute. But this is, as it would seem, par for the course for the legislature.

In combination with policy proposals, several budget details needed to be ironed out to conclude the legislative session. However, on August 12, Governor Newsom announced his end-of-session priority climate/energy package proposals. At this, many outstanding legislative and budget issues were halted. In the end, the Governor did not accomplish all his climate/energy proposals, but most were passed by the Legislature and sent to his desk for approval.

The end is always just the beginning. The legislation that was approved by both houses, now heads to the Governor's desk for his signature or veto.

For much of the legislation that becomes law, it is up to the executive agencies for interpretation and implementation. This is where the idea becomes reality, and where the rubber meets the road for all of us on the ground who such laws, regulations, programs, and projects effect.

This is just as important as our legislative advocacy work.

Almonds' position, credibility, legitimacy, and relevance are key to the work we do and how we help navigate the legislative process.

The Governor now has until September 30 at midnight to sign or veto legislation. Here are summaries of various bills that were priorities for us — things defeated, things passed, things we're working on with decision makers to determine whether they should be signed or vetoed.

GOVERNOR'S CLIMATE PACKAGE

AB 2133 (Quirk) California Global Warming

Solutions Act of 2006: emissions limit. This bill requires the California State Air Resources Board to ensure that statewide greenhouse gas (GHG) emissions are reduced to at least 55% below the 1990 level by no later than December 31, 2030. **Status: Held on the Senate Floor.**

AB 1279 (Muratsuchi) The California Climate Crisis Act.

This bill declares it the state's policy to achieve net-zero greenhouse gas (GHG) emissions as soon as possible, but no later than 2045, to achieve that goal with at least an 85% reduction in GHG emissions, and to achieve and maintain net negative GHG emissions. The bill also creates requirements for reporting from the California Air Resources Board and review by the Legislative Analyst's Office. This bill is contingent upon the enactment of SB 905 (Caballero). **Status: Signed and Chaptered.**

SB 905 (Caballero) Carbon sequestration: Carbon Capture, Removal, Utilization, and Storage Program.

This bill establishes a framework for the capture, utilization, and storage of compressed carbon dioxide, a greenhouse gas. **Status: Signed and Chaptered.**

SB 1137 (Gonzalez) Oil and gas: operations: location restrictions: notice of intention: health protection zone: sensitive receptors.

This bill prohibits the Geologic Energy Management Division from approving any notice of intention within a health protection zone, except for specific circumstances. This bill also requires all oil or gas production facilities or wells with a wellhead within a health protection zone to comply with health, safety, and environmental requirements and comply with community communication and water sampling requirements.

Status: Signed and Chaptered.

SB 846 (Dodd) Diablo Canyon powerplant: extension of operations.

This bill authorizes the extension of the operation of the Diablo Canyon Nuclear power plant (DCPP) beyond the current expiration dates for up to five additional years (no later than 2029 and 2030). This bill also authorizes a loan of \$1.4 billion from the state to Pacific Gas & Electric, the operator of DCPP, to facilitate the extension of the plant.

Status: Signed and Chaptered.

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ALMOND ALLIANCE 2022 PRIORITY BILLS

AB 1757 (C. Garcia/R. Rivas) California Global Warming Solutions Act of 2006: climate goal: natural and working lands. This bill requires the Natural Resources Agency, in collaboration with specified entities to determine on or before January 1, 2024, an ambitious range of targets for natural carbon sequestration, and nature-based climate solutions, that reduce greenhouse gas emissions for 2030, 2038, and 2045, to support state goals to achieve carbon neutrality and foster climate adaptation and resilience.

Status: Signed and Chaptered.

AB 2101 (Flora) California Carbon Sequestration and Climate Resiliency Project Registry: whole orchard recycling projects. This bill expands the list of projects that may be included on the registry to include whole orchard recycling projects. The bill defined “whole orchard recycling” to mean the onsite grinding or chipping of whole trees during orchard removal, and incorporation of the ground or chipped biomass into the topsoil prior to replanting. **Status: Signed by Governor 7.19.22**

AB 2146 (Bauer-Kahan) Neonicotinoid pesticides: prohibited nonagricultural. This bill beginning January 1, 2024, prohibits a person from selling, possessing, or using a neonicotinoid pesticide, except for use on an agricultural commodity. **Status: Vetoed.**

AB 2183 (Stone) Agricultural labor relations. This bill would enable farm workers to choose, for the purpose of union elections, between the current practice of voting in-person at a physical location or utilizing a new option to vote by mailing or dropping off a ballot card to the relevant Agricultural Labor Relations Board office.

Status: Signed and Chaptered.

AB 2201 (Bennett) Groundwater sustainability agency: groundwater extraction permit. This bill requires a groundwater sustainability agency (GSA) in a critically over drafted basin to establish and implement a process to issue permits for groundwater extraction facilities within the GSA’s jurisdiction by July 1, 2023,

unless the facility is exempted due to groundwater being used for domestic, environmental, existing, or renewable energy purposes. **Status: Died on the Assembly Floor.**

AB 2406 (Aguirre-Curry) Intermodal marine terminals. This bill would also prohibit an intermodal marine container provider from imposing those charges, extended dwell charges, or commencing or continuing free time, as defined, on a motor carrier, as defined, beneficial cargo owner, or other intermediary relative to transactions involving cargo shipped by intermodal transport under certain circumstances. This bill would also prohibit an intermodal marine container provider from commencing or continuing free time if cargo is unavailable for retrieval and timely notice of cargo availability has not been provided. **Status: Signed and Chaptered.**

AB 2550 (Arambula) State Air Resources Board: San Joaquin Valley Air Pollution Control District: nonattainment. This bill would require the California Air Resources Board to undertake certain activities if the San Joaquin Valley Air Pollution Control District does not attain the National Ambient Air Quality Standards established by the U.S. Environmental Protection Agency.

Status: Vetoed.

AB 2836 (E. Garcia) Carl Moyer Memorial Air Quality Standards Attainment Program: vehicle registration fees: California tire fee. This bill extends from January 1, 2024, to January 1, 2033, the repeal date applicable to various provisions of law that authorize local air districts to collect a variety of fees to fund the Carl Moyer Memorial Air Quality Standards Attainment Program and the Waste Tire Management Program.

Status: Signed and Chaptered.

SB 260 (Wiener) Climate Corporate Accountability Act. This bill requires any U.S.-based business with annual revenues in excess of \$1 billion and that does business in California to annually report the full range of greenhouse gas emissions attributable to the business, including direct emissions, electricity use, and indirect emissions from the business’s supply chain and other sources. The bill also

specifies procedures for implementation and enforcement by the Air Resources Board and the Secretary of State.

Status: Died on the Assembly Floor.

SB 490 (Caballero) The Buy American Food Act:

public institutions: purchase of nondomestic

agricultural food products. This bill requires a public institution that receives federal meal reimbursement funding to provide prepared meals to include in their solicitation for bids and contracts that only the purchase of agricultural food products grown, packed, or processed domestically is authorized, unless, among other things, the bid or price of the nondomestic agricultural product is more than 25% lower than the bid or price of the domestic agricultural product. **Status: Signed and Chaptered.**

SB 1084 (Hurtado) Agricultural land: foreign ownership and interests: foreign governments.

This bill would prohibit a foreign government from purchasing, acquiring, leasing, or holding an interest, as defined, in agricultural land within the State of California.

Status: Vetoed.

Budget Updates

The Governor and legislative leadership put together the final Budget Bill Jr. (AB 179) and the long-awaited Resources Budget Trailer Bill (AB 211) agreements. Both bills were passed in the final hours of the legislative session. Below are the details of the completed budget bills that are of importance to the agriculture community:



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General Ag

- Specifies that \$75 million provided in the budget to the Office of Business and Economic Development is for Small Business Drought Relief Grants, with any unspent funds being allowed to be repurposed for semiconductor research, development, or manufacturing.
- \$0.6 million to the California Department of Food and Agriculture (CDFA) for the Animal Mortality Management Program.
- \$0.3 million to CDFA for the Origin Inspection Program.
- \$1.08 million to CDFA and \$1.08 million to the Department of Pesticide Regulation for integrated pest management technical assistance.

Green House Gas Reduction Fund (Cap-and-Trade) (\$280 Million Total)

- \$50 million to the ARB for Clean Cars 4 All and other Equity Projects.
- \$10 million to the ARB for AB 617 implementation.
- \$75 million to State Coastal Conservancy and Ocean Protection Council to address sea level rise.
- \$5 million to ARB for methane satellites.
- \$30 million to ARB for community air monitoring.
- \$20 million to ARB for lower emission boats.
- \$10 million to ARB to address HFC refrigerants.
- \$5 million to ARB for wood stoves.
- \$10 million to CalRecycle for methane reduction for wastewater treatment.
- \$10 million to the California Department of Food and Agriculture (CDFA) for methane reduction using cattle feed.

- \$20 million to CDFA for the Alternative Manure Management Program.
- \$20 million to the California Energy Commission for CalSHAPE.
- \$15 million to the Department of Community Services and Development for farmworker housing in the Low-Income Weatherization Program (LWIP).

Drought & Water Highlights (\$788 Million)

- \$190 million for water recycling with \$80 million for the Metropolitan Water District and \$10 million for the City of Ontario at the State Water Resources Control Board.
- \$50 million for Metropolitan Water District resilience projects.
- \$56 million for the Sustainable Groundwater Management Act, including technical assistance for small farms.
- \$224.5 million for watershed restoration.
- \$16.75 million ongoing for Forecast Informed Reservoir Operations.
- \$25 million General Fund to the Office of Planning and Research (OPR) for the Save Our Water Campaign.
- \$4 million General Fund to the Department of Water Resources (DWR) for studying salmon reintroduction.
- \$6.8 million in General Fund to various departments for expediting large-scale habitat projects.
- \$67 million to Wildlife Conservation Board (WCB) for the Land Acquisition and Habitat Enhancement Program for the purposes of watershed climate resilience in Southern California.

- “Water Drought Response Interim or Immediate Relief” Adds to the definition of “interim or immediate relief” certain activities to increase water conservation and drought resilience planning and includes post-performance monitoring as an eligible cost for interim or immediate relief.

Energy Highlights (\$859 Million Total)

- \$100 million to support the Hydrogen Program at the California Energy Commission (CEC), and \$5 million to the Governor’s Office of Business and Economic Development to support hydrogen hubs.
- \$100 million to support the Industrial Grid Support and Decarbonization Program at the CEC.
- \$25 million to support the Food Production Investment Program at the CEC.
- \$162 million to support the Equitable Building Decarbonization program, of which \$50 million is to support the TECH initiative.
- \$20 million to support the adoption of ultra-low-global-warming potential refrigerants.
- \$45 million to support Offshore Wind Infrastructure.
- \$100 million to support Oroville Pump Storage.
- \$200 million for energy transmission projects, with the first round supporting the Salton Sea region.
- \$50 million to support carbon removal projects.
- \$235 million to support zero-emission vehicles and infrastructure.

For the most part, this legislative season has gone as we anticipated. A number of bills we opposed, like Bennet’s Groundwater Well AB 2201, we positioned with partners to stop from proceeding. All the while we prepared to work the veto strategy or influence the implementation by positioning with the administration agencies. We knew as early as April the majority of our traced bills that would make it through the legislature, and thus positioned for September.

Almonds are unique and powerful. If we want to be treated differently, we must act differently. Taking position to be of influence, regardless of the issue, is our aim. To break the reactionary “whack-a-mole” game Sacramento plays requires working with both sides of the aisle, creating new and non-traditional partnerships and breaking with the herd. Most importantly it requires the discipline to know when to lead and when to follow.

As we turn our eye to the 2023 season, Almond Alliance is focusing our energy on the issues that matter most to you — functioning supply chain and a reliable water supply. By concentrating our efforts on the state side, and expanding our federal operations, the Almond Alliance leads in solutions for our growers, our industry, and our community. ♦



Aubrey Bettencourt,
President/CEO,
Almond Alliance



Blue Diamond Awarded \$45 Million from USDA to Expand Climate Smart Orchard Programs

Funds are part of historic federal investment to combat climate crisis and protect U.S. lands and natural resources



This September, *Blue Diamond* was awarded \$45 million in funds provided by the USDA as part of a massive climate protection partnership activation.

Blue Diamond was one of 70 partners named out of 450 proposals submitted to the USDA's Partnerships for Climate-Smart Commodities: usda.gov/climate-solutions/climate-smart-commodities, for a first round of funding. Almonds are the top perennial specialty crop in the U.S. as measured by value, and *Blue Diamond Growers* is the largest supplier of almonds from California.

Mark Jansen, president and CEO of *Blue Diamond Growers*, praised the announcement. "This is a historic opportunity for our 112-year old cooperative representing nearly half of the almond growers in California," said Jansen. "These funds will help significantly accelerate and expand the stewardship impact that our multi-generational family farms are already making in orchards throughout the state. On behalf of our nearly 3,000 grower-owners, I applaud the USDA for a vision to commit meaningful investment in furthering climate smart American agricultural production."

According to Jansen, the funding will be used in the co-op's orchards, to help *Blue Diamond* growers expand existing implementation of cover crops, conservation plantings, hedgerows, and practice whole orchard

recycling. As a dynamic global consumer packaged goods company, *Blue Diamond's* unique market position enables it to connect climate-smart almond farms to consumer markets through branded almond products as well as an international ingredient business with major multinational brands all committed to climate impact reductions.

Dr. Dan Sonke, director of Sustainability for *Blue Diamond Growers*, facilitated the co-op's application for the USDA funds in the spring of this year. "We are honored by this award, which will fund on-the-ground climate-smart practices to not only sequester carbon to combat climate change, but also enhance the biodiversity of orchards and the soil. These regenerative practices enhance the resiliency of our farmers in a changing climate and with global market challenges."

Sonke says next steps for *Blue Diamond* are to work with growers, USDA officials, and applicant partners to finalize the scope and timing of proposed activities along with the related funding. More information on *Blue Diamond's* existing commitment to sustainable practices can be found on the Sustainability website at bluediamond.com/Sustainability and will be shared in the 2022 Sustainability Report anticipated for release in mid-November. Further information on the grant will be highlighted in the Sustainability session at our annual meeting on November 16 and in the November/December issue of *Almond Facts*. ♦

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After Planting & Germination, Now What?

7 Principles for Implementing a Successful Cover Crop Management Program



Honey bees working Seeds for Bees' Pollinator Brassica Mix and LOVING IT

I have noticed a few things over the years while watching growers, including myself, try cover cropping. We usually fall into one of two categories: the cover crop seed casters, and the watchful cover crop managers. The first group tends to simply plant and do nothing else until they must terminate; the others put in the time of watchful management to maximize the benefits of cover cropping.

The seed caster sees cover crop as a one-and-done in planting season. In contrast, the watchful manager sees a cover crop as something like their IPM, nitrogen, or water management programs; the more they put into it, the more they will get out of it economically and agronomically.

Project Apis m's Seeds for Bees program aims to help growers to do it right — to manage their cover crop — to be operators who are cognizant, watchful, thoughtful, and adaptive to conditions after planting *in their own unique orchard context*. So, in this article, I briefly lay out seven principles that will help you as a grower have a successful cover crop management program.

Principle 1: Irrigation and Precipitation After Germination

Principle: *If you have irrigation water and you can apply it to the planting zone, spritz it in between rains until you feel the roots are strong and deep enough to handle some stress; if relying on precipitation alone, plant right before a set of rain events as much as possible.*

Typically, we put on one post-harvest irrigation and let the trees go to sleep. That is changing with the weather, literally. Hotter, dryer, warm seasons are extending our

need to care for our trees with water after harvest, so capitalize on that with your cover crop.

There are a host of problems with water in California, and cover cropping is not immune to those challenges. We are in a drought. You may not have the water allocation to apply after harvest. You may not have the distribution uniformity to get to the middles. If you are relying on precipitation alone, you may have to wait until the later planting season at the end of October or early November to plant, or plant in the wetting zones of your drip or micro systems. Still, with all these challenges, growers can adapt and succeed — the principle remains the same.

Principle 2: Other Necessary Orchard Operations During Cover Crop Growth

Principle: *Winter dormant orchard operations must be completed for the health of your trees and almond crop for next year.*

This means that hedging, pruning, and shredding/bucking must take place, as well as shaking, decomposition, and termination of mummies, etc. These are the pillars of a healthy IPM and yield program.

¹ An example contract can be found on Project Apis m's website here: https://www.projectapism.org/uploads/1/0/5/7/105706229/pollination-contract-template__1_.pdf.

After 8 years of cover cropping in our family almond and walnut orchards in Chico, management is falling into an every-other-row cover crop program in the almonds, specifically for these reasons. For example, I want to minimize compaction with shakers, especially with mummies. I plant my cover crop in one row one year, the shakers take the other, and vice versa the following year. This method minimizes compaction in last year's shaker rows. Also, we feel the 22-foot rows of our orchard benefit from hedging every other row yearly. Last year's hedge row is where you want to plant your cover crop for the best light interception to the ground. Thinking ahead and integrating your cover crop into other management areas takes your program to a new level.

Principle 3: Pre-pollination and Communicating with Your Beekeeper

Principle: Start communicating with your beekeeper well before pollination to ensure that cover crop and pollination have the highest probability of success for the bees and your trees.



A great example of a slim strip of Seeds for Bees' Pollinator Brassica Mix at almond bloom

If you can, get a pollination contract¹ together, regardless of how small of an operation you have. This will help both you and your beekeeper, and it provides an added sense of intentionality that goes a very long way with how you care for these bees while they are on your property.

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Principle 4: Pollination's Interplay with Bee-friendly IPM During Bloom and Beyond

Principle: These principles come directly out of Almond Board of California's Honey Bee Best Management Practices for California Almonds²:

1. Maintain clear communication among all parties involved, particularly on the specifics of pesticide application;
2. If it is necessary to spray the orchard, for instance with fungicides, do so in the late afternoon or early evening;
3. Until more is known, avoid tank-mixing products during bloom; and
4. Avoid applying insecticides during bloom until more is known about the effects on honey bees, particularly to young, developing bees in the hive. Fortunately, there are several insecticide application timing options other than bloom time treatments.³

As a principle, our operation does not spray during bee flight hours/temperatures. Simply put, don't spray your bees, especially not with tank mixes that we know little about. This is especially becoming more and more true for adjuvants⁴ — we simply do not know enough about the plethora of adjuvant materials out there.



Seeds for Bees' BioBuild3 Mix. This orchard in San Joaquin County has high distribution uniformity with a solid set system. This cover crop bloomed the brassicas first during almond bloom, then, shown here after leaf out, with peas, grass, and bell beans, providing more floral resources before the bees depart to their next job.

Principle 5: IPM within the Cover Crop and Monitoring for Pests, Pre-Termination

Principle: Cover crop may provide occasional structure and food (e.g., for gophers) for unwanted pests, but just like any IPM program, careful monitoring of cover crop can and will make all the difference. Even though this is a factor in cover crop management, our experience and participant surveys strongly suggest that cover crop has vastly more benefits than drawbacks with almond IPM.

This is a developing topic in California almonds and cover crops. There have been a small number of instances over the last few years where a few technical advisors in the

² https://www.almonds.com/sites/default/files/honey_bee_best_management_practices_for_ca_almonds%5B1%5D.pdf.

³ Almond Board of California's Honey Bee Best Management Practices for California Almonds

⁴ See, for example, the research of Diana Cox-Foster's, et. al.: Chronic exposure to an agricultural spray adjuvant and honey bee pathogen causes synergistic mortality in larval honey bees (*Apis mellifera*) J Fine, C Mullin, D Cox-Foster. 2016 International Congress of Entomology. Pollinators as keystones of agriculture and natural ecosystems: Impact of organosilicone spray adjuvants on their health and reproduction. D Cox-Foster, E Klinger, W Doucette. ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY 258. Altered Feeding Behavior and Viral Detection in Honey Bees Exposed to Organosilicone. M Thompson, E Klinger, K Kapheim, D Cox-Foster. An inert pesticide adjuvant synergizes viral pathogenicity and mortality in honey bee larvae. JD Fine, DL Cox-Foster, CA Mullin. Scientific reports 7 (1), 1-9. Impacts of honey bee viruses, an agricultural adjuvant, and their interaction on blue orchard bee (*Osmia lignaria*) larval development. N Boyle, MKF Williams, E Klinger, D Cox-Foster, T Pitts-Singer. Entomology 2019.

Central Valley are connecting certain types of “new” pest pressures with the rise of the adoption of cover crop. As with any pest management system, there are many potential variables involved. A few factors must be briefly considered in this discussion while researchers investigate:

First, things are rapidly evolving with the cessation of organophosphate insecticides. This means, in part, that when growers in the past would utilize this kind of chemical for pest control, other populations of pests were unintentionally kept at bay. At least, that is the initial thinking of the UC IPM system.⁵

Now, with organophosphate materials out of play, populations of unseen pests inflicting such damage are rapidly rising. It is premature to suggest at this early stage that these pressures somehow need to be solely laid at the feet of cover crops implementation and adoption.

Secondly, with roughly a decade of warm drought years, pest populations are increasing with temperatures. As it warms, pests are looking for three things — food/water, a mate, and a home. Certainly, a cover crop can harbor unwanted pests, just like your trees. However, initial data from growers suggests this is usually due to factors that



A great example of a grower with drip who was able to watch the rain and catch it at the right time in October, producing cover crop bloom at almond bloom.

are out of the direct control of the almond operator. For example, when properties contiguous to almond orchards have certain annual row crops harboring pests, are cut in the annual rotation, the pests move to find food/water, a mate, or cover for a new home.

The bottom line on this issue today is that we must work to adapt to new pest pressures. When implementing a cover crop program, we need the foresight to know that pest changes can become an issue — just as we must do when making other major changes to an orchard management system.



This grower needs a gold star. They timed the planting perfectly to coincide with fall rains. Brassica came up with almond bloom, then the grower did a high mow at leaf out to let the grass, peas, and bell come up. Taken last year in drought with a drip system!



⁵ As an example, see UC IPM’s work on the stink bugs in almonds: <https://www2.ipm.ucanr.edu/agriculture/almond/Stink-Bugs/>



An example of our BioBuild3 Mix that had a poor germination and a poor stand for almond bloom. Also taken last year in April! See the difference?

I am of the mind that terminating at the proper time may already be a huge contributing factor to control these emerging populations *within the cover crop contexts*. It is also worth mentioning that countless growers report they took their mite sprays off the table due to cover crops, likely due to dust reduction. Or the many stories we have heard from our growers about all the beneficial, predatory insects *helping* with almond IPM. There is certainly more ongoing research on this subject, so stay tuned.

Principle 6: Termination Rationale, Timing, and Methods

Principle: *Timing and method will vary from ranch to ranch, but the rationale won't. We terminate for three main reasons: 1. Not to impede or add to our water use budget*

of the cash crop as temperatures warm; 2. To reduce/eliminate unintended pest pressures that may damage the crop if levels are too high; and 3. To reduce unintended exposure to pollinators of all kinds with warm season crop control applications, including herbicides.

For methods of termination, consider looking to the Almond Board of California's Cover Crop Best Management Practices. This is online at Project Apis m.'s website.⁶ We send all Seeds for Bees growers a hard copy of this and Honey Bee Best Management Practices for California Almonds⁷: projectapism.org/seeds-for-bees-resources.html

⁶ <https://www.projectapism.org/seeds-for-bees-resources.html>.

⁷ https://www.almonds.com/sites/default/files/honey_bee_best_management_practices_for_ca_almonds%5B1%5D.pdf.



At bloom, if planted, germinated, and managed properly, a lot of underground biomass can be present. The grower (me!) had the 90%+ DU in Chico and used small spritz to keep things moving until the rain came. Photo taken at peak bloom for the nons.

Principle 7: What We Know and What We Don't About Frost

Principle: *If it'll make you sleep better at night, mow it.*

We need to know more about frost and cover crop, and growers should do what they feel is necessary to protect the crop and trees. You should also know that this is an ongoing research discussion with new, relevant data coming to the fore. Just imagine: what if cover crop can be shown to increase or hold heat that transfers to the canopy to reduce frost potential?

There are a few things in the research community that we know about frost and susceptible almonds. First, frost risk

is greatest in nutlet stage after petal fall.⁸ Second, cover crop, or any resident vegetation in the orchard rows for that matter, can reduce soil temperature compared to bare soil if not cut to two inches or below. This, in turn, can affect heat transfer.⁹ However, new questions are being asked, mainly because growers seem to be experiencing different things when cover crop is left higher than two inches.¹⁰ Furthermore, recent research from UC Davis has pointed out several interesting dynamics new to this discussion.

Surface temperature in almond orchards with cover crop can be higher because the water in the cover crop

⁸ Connell, J. Almond Notes. UC Cooperative Extension. 15 February 2011. https://cebutte.ucanr.edu/newsletters/Almond_Notes74292.pdf.

⁹ Snyder, R.L., & Connell, J. (1993). Ground cover height affects pre-dawn orchard floor temperature. *California Agriculture*, 47(1), 9–12. <https://calag.ucanr.edu/archive/?type=pdf&article=ca.v047n01p9>.

¹⁰ Cf. Blue Diamond Growers' Almond Facts July/Aug edition in 2022 to see our survey data given to us by growers about what they experienced with cover crop and frost this last season, https://bluediamondgrowers.com/wp-content/uploads/2022/08/Blue-Diamond_AlmondFacts_JulyAug_2022_web-A.ADAcompliant.pdf.

IN YOUR ORCHARD

holds heat.¹¹ Initial research has also demonstrated that air temperature 3-5 feet above the ground level is not reduced in cover cropped orchard compared to bare dirt, “indicating that in some cases the presence of a cover crop may not affect overnight temperatures *at the canopy level, despite differences at the ground level*” (emphasis my own).¹² Curiously, the current recommendation based on UCCE research for our industry has not yet changed from that of cutting it to two inches or below.

Conclusion

Growers need to know that there are challenges with cover crop, and there is no silver bullet - but there is certainly much silver lining. The ongoing and emerging challenges above should not stand in the way of starting or continuing a successful cover crop program. *Blue Diamond Growers* and *Project Apis m.* are tackling these issues head on with funding and research. I am convinced that successful cover crop *management* is key to *experiencing the many benefits* they can provided to your operation. Cover crop seed casting without additional management attention will end in frustration. These seven principles will get you well on your way. Let’s get to work. ♦



Rory Crowley,
Director of
Habitat Programs,
Project Apis m.
Rory@ProjectApism.org




An example of flail mow termination of Pollinator Brassica in a young orchard.

¹¹ Almond Board of California Cover Crop Best Management Practices, 13.

¹² Ibid. Also, Cf. Gaudin, A. 2018. Cover Crop Systems for Almond Orchards: Exploring Benefits and Tradeoffs to Inform Management. ABC Annual Research Report (2017-2018) on Project STEWCROP7.

Seeds for Bees encourages the use of cover crops to increase the density, diversity, and duration of bee forage in California orchards, farms, and vineyards, while improving soil health. First year Seeds for Bees enrollees are eligible for a \$2,500 discount off their total seed purchase. Second year enrollees are eligible for a \$1,500 discount off their total seed purchase. If you want to learn more about Seeds for Bees and planting cover crops in your orchards, check out our ***NEW*** Quick-Guide where you can access resources, enrollment information, and technical guidance, at: bit.ly/sfb-quick-guide, or visit ProjectApism.org/Seeds-For-Bees.




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THE ALMOND BOARD

Case Study Tests New ROI Calculator

Many almond growers have heard their peers, as well as others with interest in improving pollinator habitat and soil health, endorse the planting of cover crops to accomplish those goals.

Those same growers may have wondered if money spent on seeds and labor as well as the cost of time to manage cover crops truly pay off. Can the economic benefit of cover crops accurately be measured and, if so, what is the return on that investment (ROI)?

The Almond Board of California (ABC) — in an effort to directly address questions about the ROI of cover crops — recently completed a case study of one orchard in Stanislaus County where cover crops have been planted for a decade. The case study relied on a calculator system developed by the American Farmland Trust.

Michael Roots, ABC's specialist for field outreach and education, worked with grower Christine Gemperle to evaluate the ROI of cover crops on 20 acres of her 40-acre orchard near Ceres. The result was an easy-to-read two-page document now available for other growers to review: live-almonds-next.pantheonsite.io/sites/default/files/2022-07/ABC_AFT_Gemperle%20Case%20Study.pdf

A combination of published machinery and material cost estimates and data supplied by Gemperle was used to estimate the cost of operations, on average, before and after cover crops were planted. The analysis was limited to only those income and cost variables affected by cover crop adoption.

The bottom line? Gemperle's net income per acre grew by \$499 annually, for a total of \$9,976 for the 20 acres. That works out to an ROI of 459% based on the \$1,516 average cost of seeds plus the value of her time (\$655) each year to fine tune the process.

"She's seen a huge increase in net income," said Roots. "She's been creative and figured out how cover crops work for her."

Gemperle's trees were 9 years old when she first planted cover crops in 2012. Thanks to meticulously kept records, she credits cover crops for increasing yield by about 8% while, at the same time, reducing her pesticide and herbicide costs.

Her strategy — which has evolved throughout the years — is relatively simple. She plants cover crops in every other row, usually by early October. She waters those seeds during her last post-harvest irrigation of the fall. She uses the "clean" rows — those without cover crop seeds — to remove mummy nuts and prune. Once those tasks are finished, she plants her other cover crop seeds down those rows as well, usually by early December.



In addition to creating an inviting habitat for honeybees and other natural pollinators, Roots said Gemperle has reduced weed populations, improved soil moisture retention and reduced pesticide applications. She's also saved money on labor.

"The diversity of weeds she's seen has decreased, so a lot of the hard-to-kill weeds have disappeared as the cover crop has taken over. She doesn't have to spray as often and she doesn't have to use as much material," Roots explained. "She also doesn't spray in May for mites because of all the beneficial insects that her cover crops host."

Gemperle also has observed that her trees are more resilient, less prone to leaf drop and less prone to wilting during harvest.

"She's found a good way to be cost effective and get the job done in an economic manner. Especially since she's doing all the work herself," Roots said.

Roots added reaching out to the Almond Board or American Farmland Trust to participate in a case study can be a good way for a grower interested in determining the ROI of their existing, or potential, cover crops. It can be used to determine the ROI of their own orchards as each situation is likely to be unique.

"Everybody implements cover crops a little differently," he said.

Growers interested in the American Farmland Trust's soil health calculator can learn more at the organization's website: farmland.salsalabs.org/sh_casestudies_methods/index.html ♦

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TIME TO CONSIDER

Harvest is over. Now what?

Entering the fall months is a time when things slow down in the orchards. Now some may still be harvesting, but soon, you too will be able to take a breath and reflect on the year. Years for farmers work differently than they do for most. A new year in farming begins when the final nut from harvest leaves the field. That means to have a successful 2023 harvest, you have set the foundation today. What can be done to start this new year off right?

1. **Planning** is vital to having a successful year. We have all heard the quote from Benjamin Franklin that states “Failing to plan is planning to fail,” and it applies to farming perfectly. Now is the time to sit down and plan out the year going forward. A good idea is to set up a meeting with your PCA/CCA. In this meeting you can debrief on the past year. You can go over tissue, soil, and hull samples to see where you may have some deficiencies. Discuss what worked and what didn’t, where you could improve, and what your goals are for the new year. In this meeting you can also work on a fertilizer and pesticide budget.
2. A **budget** will help plan out spray and fertilizer applications, what products you might use, and the cost of those applications. Having this road map will lead to less confusion, and a more focused approach to farming for 2023.
3. **Water** is the most important task post-harvest. After harvesting it is vital to return to watering at the full rate of Evapotranspiration (ET). ET is the amount of water being used by the crop in a given time period. Reduced water in the post-harvest timing may result in reduced bloom and crop the following year. The latter half of summer and fall is when the trees are going through bud differentiation, which means they are deciding how many buds will become fruiting or will stay vegetative. If the tree does not have enough energy stored or is not strong enough to support fruiting buds, the result will be more vegetative growth, which leads to lower crop the following year. As we all know, water availability is different for each grower — but if you have it, use it!
4. What about nutrient demand? The times when growers used to apply 75-100 units of **Nitrogen (N)** post-harvest are gone. According to the CDFA Fertilization Guidelines, only 20% of your yearly nitrogen should be applied in the post-harvest timing. In some cases, the post-harvest application may be reduced, or even eliminated. If July tissue samples show nitrogen concentration of higher than 2.5% or 2.8%, the extra nitrogen may not be needed. If your crop came in heavier or your nitrogen levels were low in the July samples, a nitrogen application would be a good idea to provide energy for next year’s bloom. **Potassium (K)** is also vital for next season’s bloom. Checking the K levels in the soil and tissue can help decide the best materials to be used. In some soils K levels may be high, but that parent material may not be available to the tree. This would be a situation where a soil applied granular would come into play. Remember, K does not



Figure 1 Photo by Ben Goudie

have much leaching potential, except in sandy soils, so you want to place the material in a concentrated strip about 3–4 feet from the tree. In micro irrigation situations, you can use a diverted broadcast method to spread the material through the irrigation wetting zone for more contact with feeder roots. Drip irrigation makes things a little difficult when trying to soil apply potassium material in the irrigation wetting zone, so fertigation during the season will be needed to supplement any deficiency. As you can see in *Figure 1*, this drip irrigation orchard has a sulfate of potash (SOP) application nowhere near the wetting zone, which will lead to, at best, an inefficient uptake. This is an example of how not to apply SOP. If tissue samples are low, a liquid injection of K is recommended to get a quick response within the plant. I always thought of potassium in the soil as a savings account and potassium levels in tissue as a checking account. You can remove and add money to a checking account easily. However, if you deplete your savings account, it can take years to replenish it.

5. The last sample that should be taken this time of year is a hull sample. Hull samples give a better representation of **Boron** levels, since boron accumulates in the hull. According to the CDFA Fertilization Guidelines, a sample with less than 80ppm is considered deficient. A soil application of Boron in the dormant season can be made to raise levels in deficient orchards. Samples that are between 80ppm–120ppm would benefit from a post-harvest foliar application of boron. Always discuss boron applications with your PCA/CCA, since over application can lead to toxicity. As I mentioned above, post-harvest foliar nutrient sprays can be beneficial. Applying them soon after harvest is finished allows the plant to utilize that energy

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and put it to use for next year's crop. Tasks may pile up after harvest, so be diligent in making this application. If it is applied too late in the season and leaves are falling, the benefit of the application will be lost. Many of the available nutrient sprays include material such as boron, phosphite, and zinc. When these nutrients are applied, they enter through the leaf. The tree then goes through the senescence period, where the tree will pull all the available nutrients from the leaves to store for the dormant period. Applications of Zinc Sulfate used to be popular to "put the trees to sleep." Nowadays, it is used to reduce inoculum of diseases like scab and rust by removing the leaves from the infected trees. In an orchard that does not have these issues, you would not want to prematurely remove the leaves for a couple of reasons:

- Trees continue to go through the photosynthesis process after harvest and are producing carbohydrates, which will be stored for next year's bloom.
 - If an application of Zinc Sulfate is made before the plant has entered the leaf senescence period and is still trying to perform photosynthesis, the tree may produce new leaves. These new leaves will remove the stored energy from the plant and most likely lead to a reduced bloom the following year.
6. **Soil amendments** are another topic that needs to be discussed for the post-harvest timing. In reviewing soil samples with your PCA/CCA, you can decide which product you may or may not need. **Ag Lime** is used to raise soil pH in acidic situations, and if your soil is low in magnesium, **Dolomite** may be a better fit. For soils that already have a high pH, you will need to look at applying **sulfur** to lower the pH. **Gypsum** is pH neutral and can be used to help reduce soil crusting. The reduced soil crusting will increase water infiltration.
7. Winter **Weeds** will start showing up soon after harvest. The UC Davis IPM website introduction to weed photo gallery — UC Statewide IPM Program (ucanr.edu) has an excellent photo gallery to help you identify what



Figure 2 Cover Crop Photo by Ben Goudie

weeds you have. (ipm.ucanr.edu/PMG/weeds_intro.html) This, along with talks with your PCA, will give you an understanding of what product will work best for your situation. It is also smart to talk about a pre-emergent application, and how to set it up to be as successful as possible. **Cover Crops** can also be planted in this post-harvest timing. Broadcast or drill the seed in before your final irrigation or a fall rain—ideally by the end of October. This will lead to a good germination, and growth with winter rains (hopefully!). This will also help you take the next step to qualify for the Triple Diamond Level of *Blue Diamond's Orchard Stewardship Incentive Program*. If you would like more information on the program, please contact your Regional Manager.

Lastly, some cultural practices are done in the post-harvest timing. Many fields will need to be floated to smooth out the orchard floor after harvest. Others with high amounts of plant material or clippings may need to be rototilled. Growers may also start to plan winter shaking and decide if it needs to be done. Let me tell you, **it does!** A future article will talk about the importance of winter shaking, so stay tuned! In the end take some time to reflect and rest before all the work starts again. ♦



Trent Voss
Regional Manager
Blue Diamond Growers



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