



2024

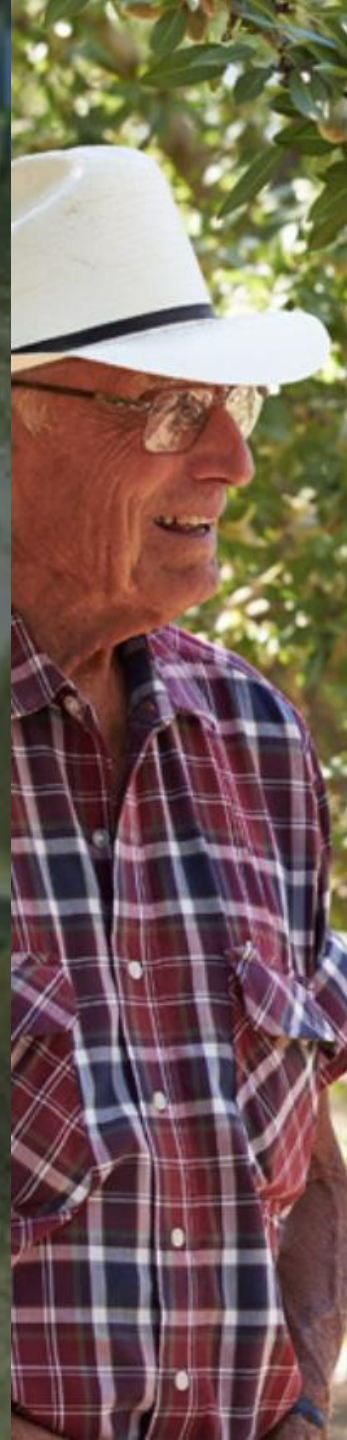
ROOTED TOGETHER
THE ALMOND CONFERENCE





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TELLING THE ALMOND SUSTAINABILITY STORY



PANELISTS



DANIELLE VEENSTRA

Almond Board of California

MIKE BRIANO

Harris Woolf

JOSETTE LEWIS

Almond Board of California

ASHLEY BOREN

Sustainable Conservation



**CONSUMER
BEHAVIOR**



**MEDIA
NARRATIVES**



**POLICY +
REGULATIONS**



**CPG
DEMANDS**



**FARM
REALITIES**



MORE RECYCLING. LESS EMISSIONS.

Almonds are grown in a shell, protected by a hull, on a tree – and nothing goes to waste.

Putting Mother Nature's gifts to good use helps significantly offset the carbon emissions of growing almonds.



Mandeln.
DIE MUTTER ALLER SNACKS.

CONSUMERS

In a Nutshell
Special Edition: Sustainability Value in California Almonds

Global conditions are driving consumers to examine the value of their food and beverage purchases, and products that deliver on shoppers' core expectations for taste, personal health and sustainability are best positioned to maintain relevance and demand. For snack manufacturers, the Almond Board of California (ABC) is providing new resources to help inspire innovation and communicate almonds' standout sustainability story to global consumers.

What You Get with a Handful of Almonds

FOOD COMPANIES

Almonds are a versatile and water-efficient ingredient that lend desirable sensory and nutrition benefits to food and beverage products. Because they're a shelf-stable food, less

LOW CARBON FOOTPRINT

- Trees store carbon in their wood and they grow. Almond trees store one of the amounts of carbon, 18 metric tons, per metric ton of almonds. That amounts to 30 million metric tons sequestered in all California almonds.

30 million metric tons of carbon sequestered in almonds

3,124 Basing 1235*

This is how much carbon fits relative to a 100g almond based on a life cycle assessment. Almonds have a footprint of 1 kg CO2eq per kilogram of food product.

Greenhouse gas emissions per kilogram of food product (kg CO2eq)

Almonds: 1.1

Other products: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 10.0

1. California Almond Board. An Inventory of Ecosystem Carbon in Natural & Working Lands, 2018 Edition (Update). California Almond Board, 2018. <https://www.almonds.com/resources/working-lands>

2. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

3. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

4. Alissa Krenzel, et al. Lifecycle Based Assessment of Energy Use and Greenhouse Gas Emissions in Almond Production Part 1: Field and Processing. Almond Board of California, 2023. <https://www.almonds.com/resources/lifecycle-based-assessment>

5. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

6. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

7. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

8. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

9. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

10. California Air Resources Board. Greenhouse Gas Emissions Inventory, July 2023.

ZERO WASTE

- Almond hulls, shells and woody biomass can be reused as feedstocks for bioplastics, bioenergy, clothing fiber, soil amendments, food and cosmetic ingredients.
- Efforts are underway to obtain GRAS (generally regarded as safe) status for almond hulls for food applications, adding fiber and phytonutrients while recycling this almond product.
- Export markets for almond hulls and shells are being pursued, with the objective of bringing more economic value to growers.
- A renewable solution for the trees at the end of their productive lives is Whole Orchard Recycling, which involves grinding up orchards and incorporating the woody biomass into the soil. ABC-funded research indicates that over time this practice increases yields, returns nutrients to the soil, increases water infiltration and storage¹, and sequesters 2.4 tons of carbon per acre in the soil.²
- In the space of only a few years, Whole Orchard Recycling has been adopted by some 85% of farm organizations.³

1. Ewel Johnson, et al. Orchard recycling improves climate change adaptation and mitigation potential of almond production systems. FUS ONE, March 2020.

2. Seth Wyers, et al. Climate mitigation case: sequestration and government incentives for almond orchard carbon sequestration. Environmental Research Letters, 2017.

3. CAPS, November 2024.

NUTRITIONAL POWERHOUSE

- One portion (1 Oz) of almonds provide¹:

13 grams of unsaturated fats	3.9X as much avocado	0%	13 grams of unsaturated fats	5.7X as many bananas	0%
6 grams of protein	4.8X as much quinoa	0%	6 grams of protein	16.9X as much cooked asparagus	0%
3.9X as much avocado	0%	2.3X as many chickpeas	12.5X as much raw spinach	13.3X as much pineapple	0%

1. United States Department of Agriculture, Agricultural Research Service, USDA National Nutrient Database for Standard Reference, Release 28, 2015.

WATER EFFICIENCY AND USE

- 80% of almond orchards use efficient micro-irrigation, allowing precision irrigation based on tree/soil needs and weather conditions.¹
- 15% more reduced water used between 2016-2022, part of a 25% reduction goal by 2025²
- 33% reduction in water used to grow each almond shell, 1990s-2010s³

Groundwater recharge is essential to support implementation of California's Sustainable Groundwater Management Act (SGMA). ABC's Introduction to Groundwater Recharge guide has been cited as a model resource for growers seeking to do on-farm recharge.

Four crops for every drop

Almond hulls are nutritious dairy feed, saving 4 million U.S. households annual water use⁴

440 billion gallons of water*
wood hull shell kernel

1. CAPS, November 2024.

2. University of California, 2016. Food and Agriculture Organization of the United Nations, 2016. <https://www.almonds.com/resources/water-efficiency>

3. CAPS, Almond Orchard 2025 Global Market, March, November, 2022.

4. UC Davis, Department of Agricultural and Resource Economics, Sample Cool Shady Almonds: New and Organic Almonds, 2020. <https://www.almonds.com/resources/water-efficiency>

5. Cool Shady Almonds: New and Organic Almonds, 2020. <https://www.almonds.com/resources/water-efficiency>

POLICYMAKERS

Almonds are a versatile and water-efficient ingredient that lend desirable sensory and nutrition benefits to food and beverage products. Because they're a shelf-stable food, less

CLIMATE WEEK NYC

CLIMATE GROUP

About Main program Sponsors

Harnessing California's spirit of innovation for on-farm climate change solutions at scale

- Secretary Karen Ross, California Department of Food and Agriculture
 - Dr. Josette Lewis, chief scientific officer, Almond Board of California
 - Allison Jordan, vice president of environmental affairs, Wine Institute
- See all
- Event by: Almond Board of California

Event format: In-person

1 hour 30 minutes

English

THOUGHT LEADERS



Everything you get with a handful of Almonds

Everything you get with a handful of Almonds

Creating the most out of every drop

33% More water for almonds in 2025 vs 1990s

15% More water for almonds in 2025 vs 1990s

Four crops for every drop

Reducing the water needed to grow other feed crops

Nothing goes to waste

Building biodiversity

Why California?

Health and nutrition

No food waste here

Climate smart farming

Almonds trees store a lot of carbon

More crop per drop

Everything you get with a handful of Almonds

Getting the most out of every drop

33% More water for almonds in 2025 vs 1990s

15% More water for almonds in 2025 vs 1990s

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Almonds trees store a lot of carbon

More crop per drop

Four crops for every drop

Almonds have a low carbon footprint

Why California?

Reducing the water needed to grow other feed crops

Building biodiversity

Health and nutrition

California almond trees store a lot of carbon

More crop per drop

Everything you get with a handful of Almonds

Getting the most out of every drop

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Digital Infographic

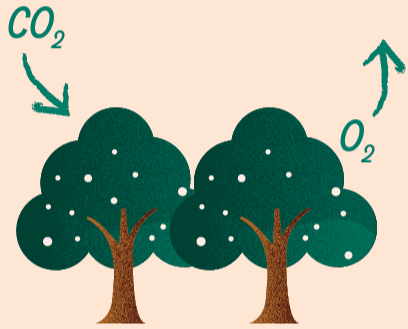
8.5"x11" Printable

16:9 Slides

36"x24" Poster

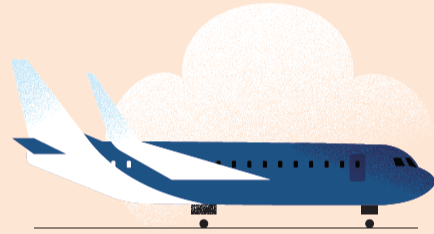
Available at Almonds.com/StewardshipResources

California almond trees store a lot of *carbon*



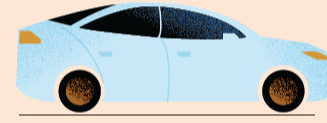
30 million
metric tons
of carbon

=



3,134
Boeing 737s

or



24.5 million
gas-powered
passenger
vehicles

or

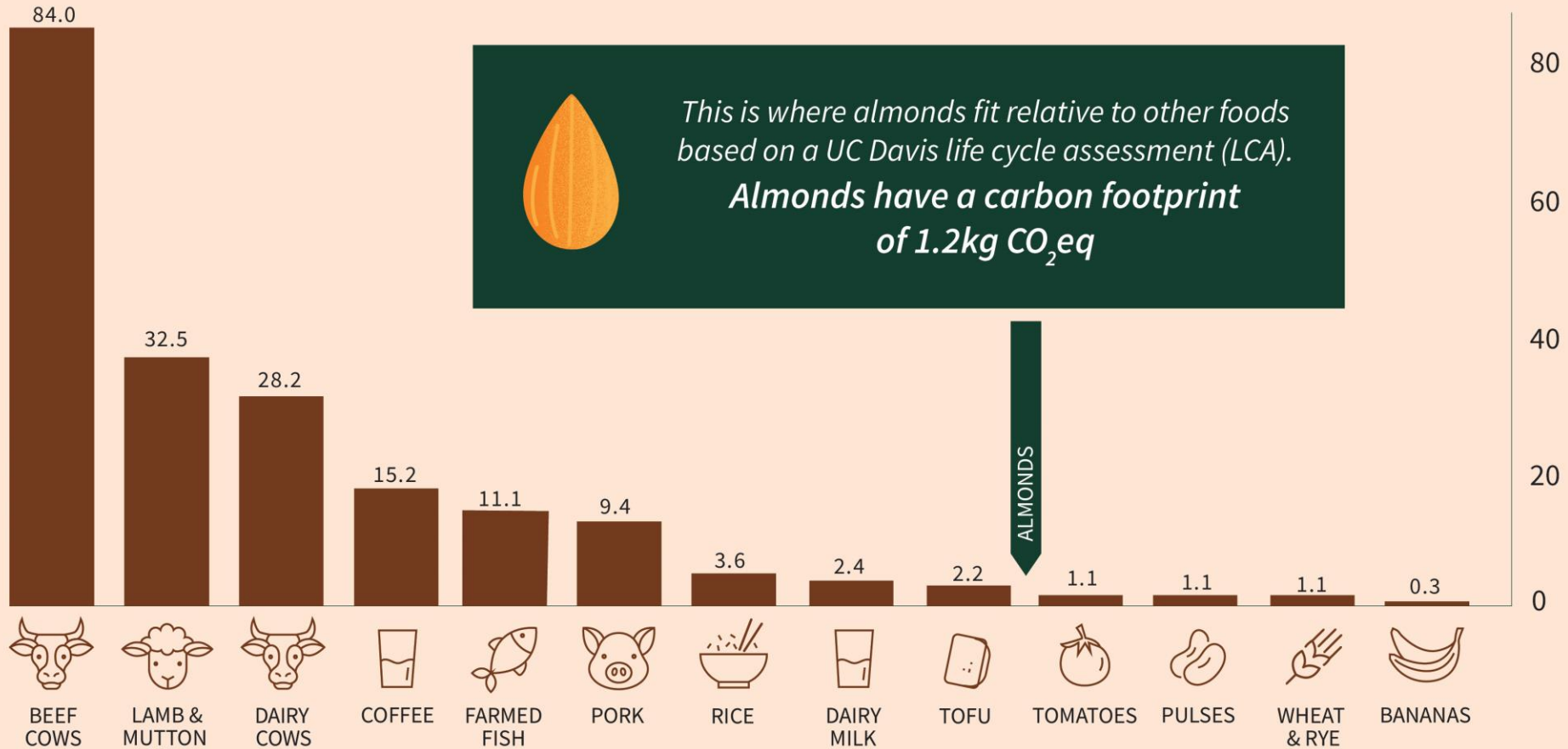


29
coal-fired
power plants



Use this QR code to access citation information.

Almonds have a low carbon footprint



Greenhouse gas emissions per kilogram of food product (kg CO₂eq)



Use this QR code to access citation information.

Building biodiversity



1 in 3 *bites*
of food depend
on pollinators.

Growing more than *almonds*



86%

of all U.S. **bee-friendly certified farms** are almond farms.



42%

of California almond orchards (685K acres) **maintain cover crops** between tree rows.

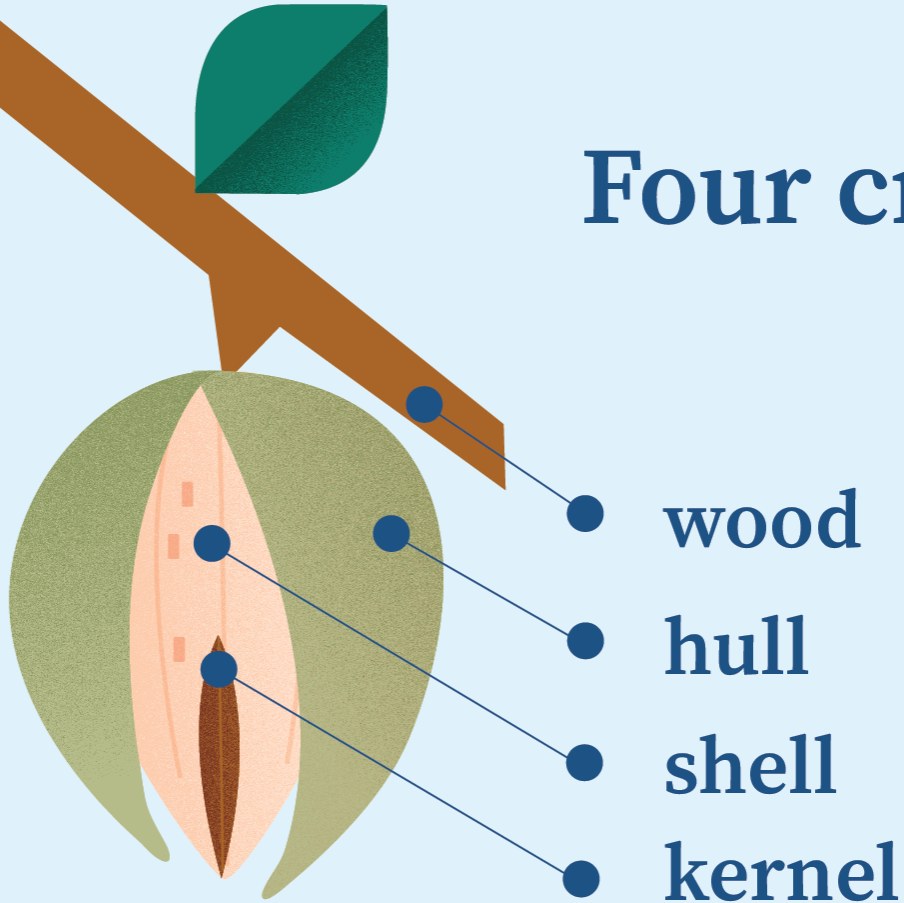


Helping
honey *bees*

Bees get their first food of the year in almond orchards as they collect nutritious pollen and nectar. Beekeepers report their **hives consistently leave stronger** than when they arrived.



Four crops in *one*



Almond orchards actually grow four products: the kernel you eat, which grows in a shell, protected by a hull, on a tree productive for approximately 25 years.



Use this QR code to access citation information.

Reducing the water needed to grow feed *crops*



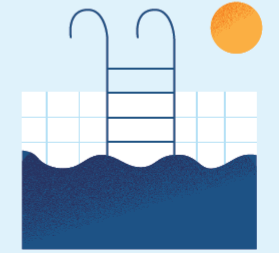
Almond hulls are nutritious **dairy feed**, saving



=



or



440 billion
gallons of water

4 million
U.S. households'
annual water use

667,000
Olympic
swimming pools



Use this QR code to access citation information.

Why California?



Family farms

There are 7,600 almond farmers in California: **90% are family farms**, and 70% of orchards are 100 acres or less.



High standards

California's growing environment is one of the **most regulated globally**, with strict laws protecting the environment, worker and food safety.



Ideal climate

California is **1 of only 5 Mediterranean climates** on Earth, essential to growing almonds.



Nutrition Facts

Amount/Serving	% Daily Value*	Amount/Serving	% Daily Value*
Total Fat 15g	19%	Total Carbohydrate 6g	2%
Saturated Fat 1g	6%	Dietary Fiber 3g	11%
Cholesterol 0g	0%	Total Sugars 1g	
Sodium 0g	0%	Includes 0g of Added Sugars	
		Protein 6g	

Calories 170 per serving
 Vitamin D 0mcg 0% • Calcium 76mg 6% • Iron 1.1mg 6% • Potassium 202mg 4% •
 Phosphorus 134mg 10%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Ingredient: Dry roasted almonds. Allergen Statement: Peanut Free, May Contain Other Tree Nuts



SNACK NATURALLY
 WITH RESPONSIBLY GROWN
 CALIFORNIA ALMONDS



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SNACK NATURALLY
 WITH RESPONSIBLY GROWN
 CALIFORNIA ALMONDS



Unpack the natural nutrition of 23 almonds per serving in more variety at Almonds.com. Almond Board of California Almonds.com



Scientific evidence suggests that eating almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.

Scientific evidence suggests, but does not prove, that eating 1.5 ounces per day of almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.



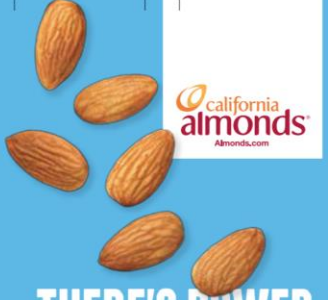
Scientific evidence suggests, but does not prove, that eating 1.5 ounces per day of almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.

Calories 170
 Calories from Fat 130
 on a 2,000 calorie diet. **100% FAT FREE!**

Label Value*	% Daily Value*	Label Value*	% Daily Value*
Total Fat 15g	19%	Total Carbohydrate 6g	2%
Saturated Fat 1g	6%	Dietary Fiber 3g	11%
Cholesterol 0g	0%	Total Sugars 1g	
Sodium 0g	0%	Includes 0g of Added Sugars	
		Protein 6g	

Processed in a facility that also uses peanuts.

THERE'S POWER
 IN THE CRUNCH OF
 ALMONDS



Get your daily serving of crunch... Just 1 ounce, about 23 almonds, whenever, wherever. Almond Board of California Almonds.com



Scientific evidence suggests, but does not prove, that eating 1.5 ounces per day of almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.

Panel | CENTER WEB | CENTER FACE | 3" Face | Left Rear Panel

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes toward a diet of other people's secrets.
Allergen Statement: Peanut-Free, May Contain Other Tree Nuts.
Ingredient: Dry roasted almonds

END SEAL



SNACK NATURALLY
Good for you. Good for the planet.

END SEAL

Side Panel
Copy not recommended
Color and Images OK

Side Panel
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Color and Images OK

Scientific evidence suggests, but does not prove, that eating 1.5 ounces of nuts a day, such as almonds as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.



90%
of California's almond farms are family farms, and 70% are 100 acres or less.

86%

of all U.S. bee-friendly certified farms are almond farms, supporting pollinators and biodiversity.

ALMONDS.COM/WHYALMONDS

4 crops per *drop*

Almonds for us, hulls and shells for livestock feed and bedding, and carbon-capturing trees.

ALMONDS.COM/WHYALMONDS



90%

of California's almond farms are family farms, and 70% are 100 acres or less.

ALMONDS.COM/WHYALMONDS



30 million tons of *carbon*

are captured by California's almond trees, offsetting the annual emissions of 24 million cars.

ALMONDS.COM/WHYALMONDS





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Telling the Almond Sustainability Story

Speaker: Michael Briano (Harris Woolf)



ALMOND BOARD OF CALIFORNIA

HWA's Keys to Sustainability Success

- Willing ownership group
- Supportive customers
- Willing and compensated supply chain (GROWERS!)
- Realistic and achievable practices that are scalable
- Conservative approach
- Leverage existing resources



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Telling the Almond Sustainability Story

Speaker: Josette Lewis (ABC)



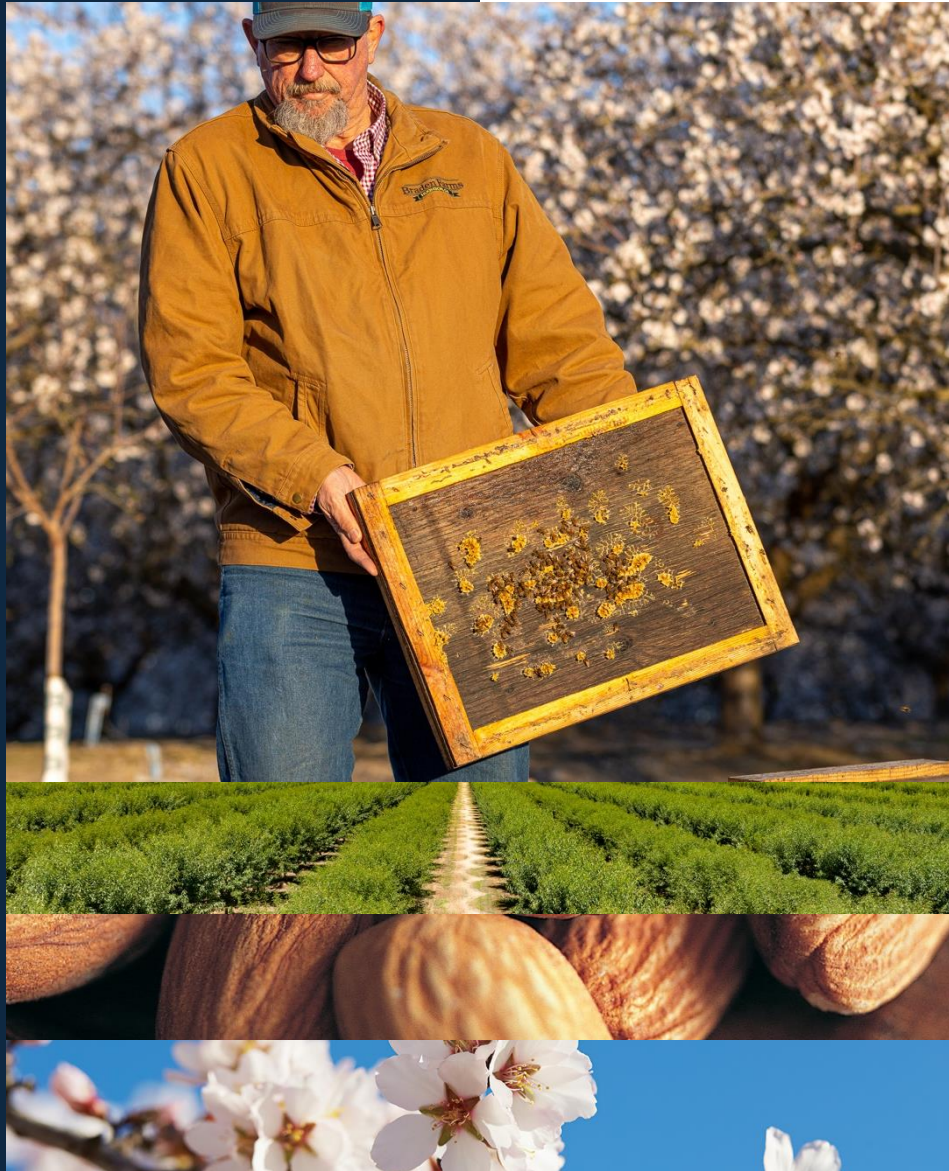
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Moving the needle
on our water story





Seen what's possible with pollinators

86% registered Bee Friendly Farms are almonds

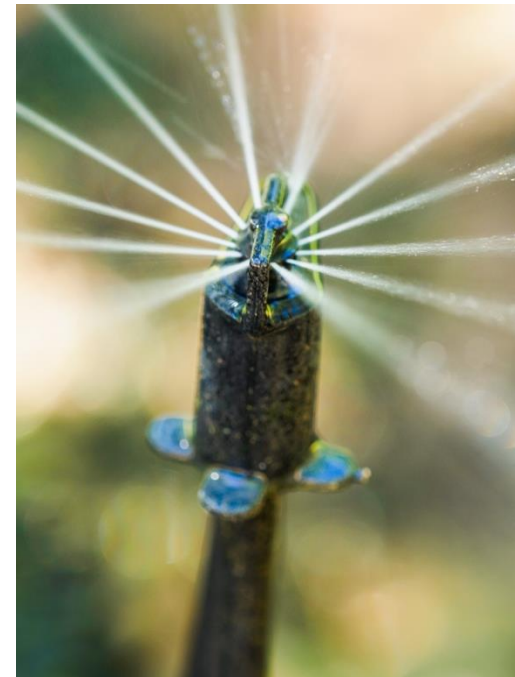
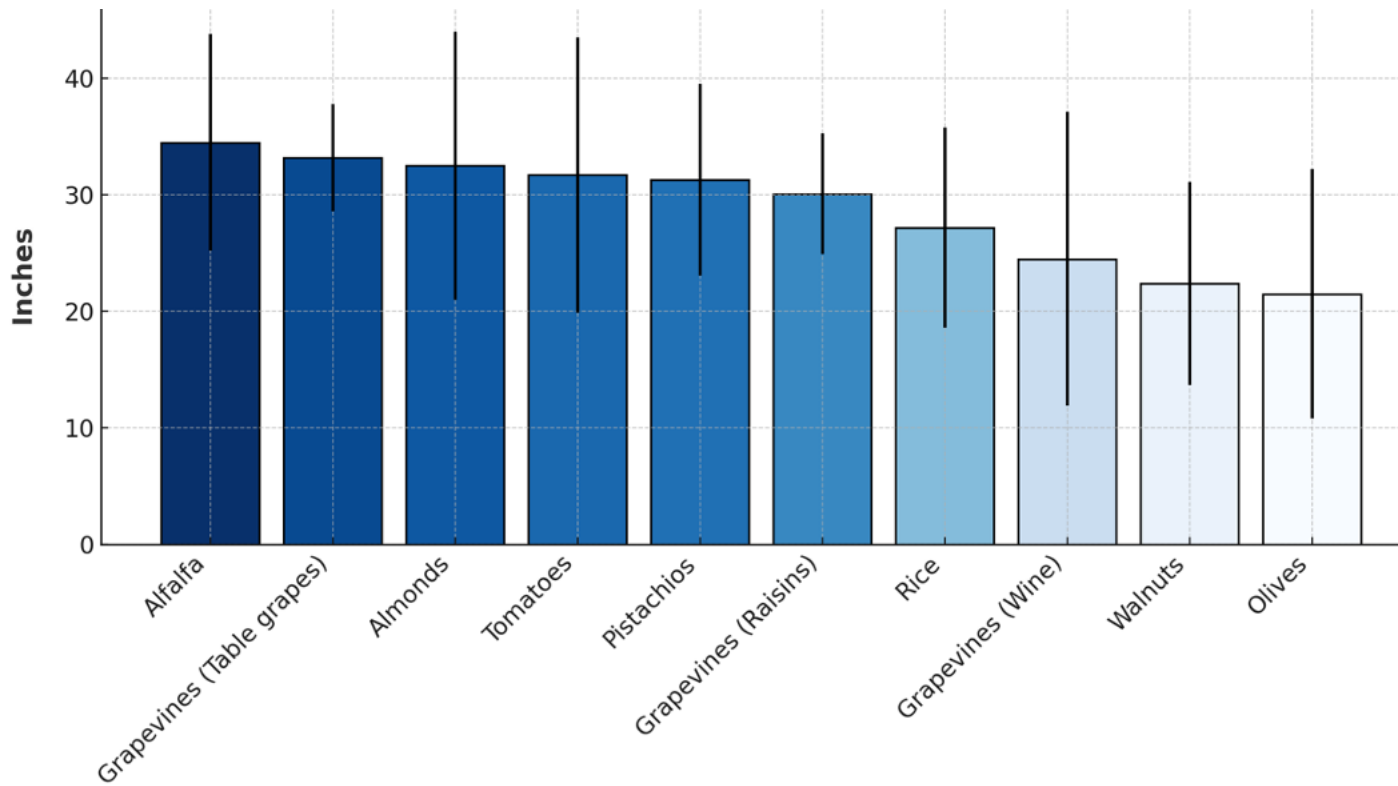
More than 35,000 acres permanent habitat
+ more than 100,000 acres of floral cover
crops

Honey bees are healthier with cover crops

Net benefit to native bees with habitat
alongside orchard

Conservation partners tell our story

Almonds not the thirstiest crop

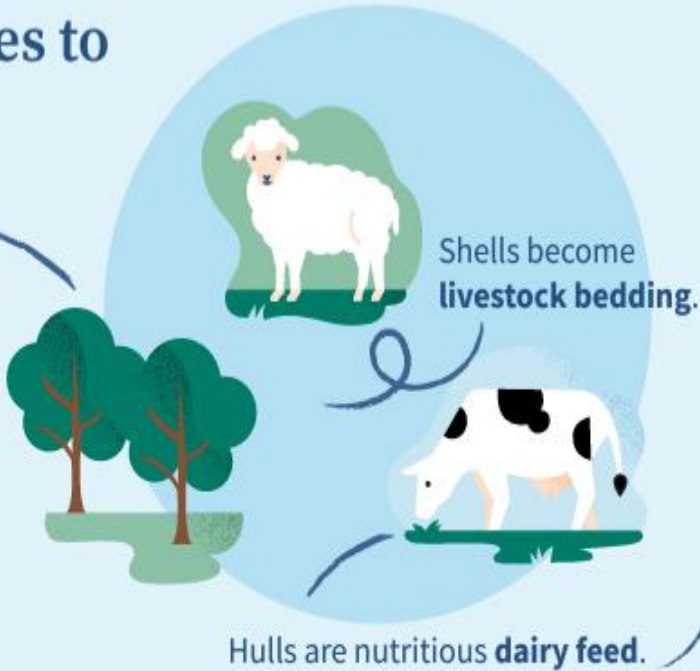


Co-product use saves water



Nothing goes to *waste*

Trees store carbon and are **transformed into electricity** or ground up into the soil at the end of their lives.

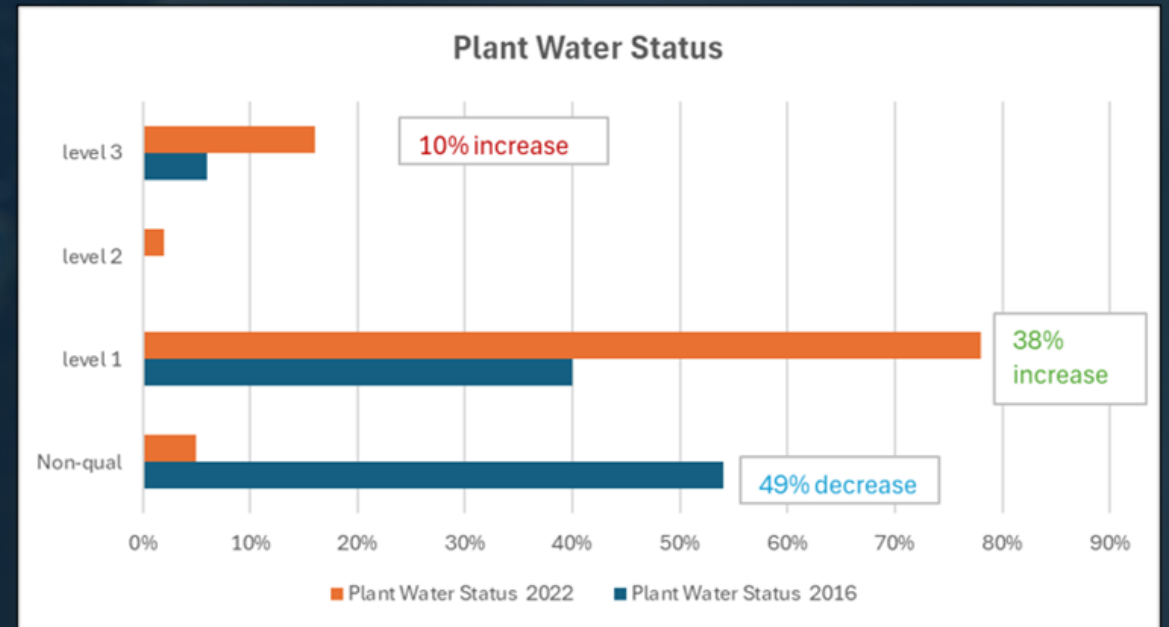
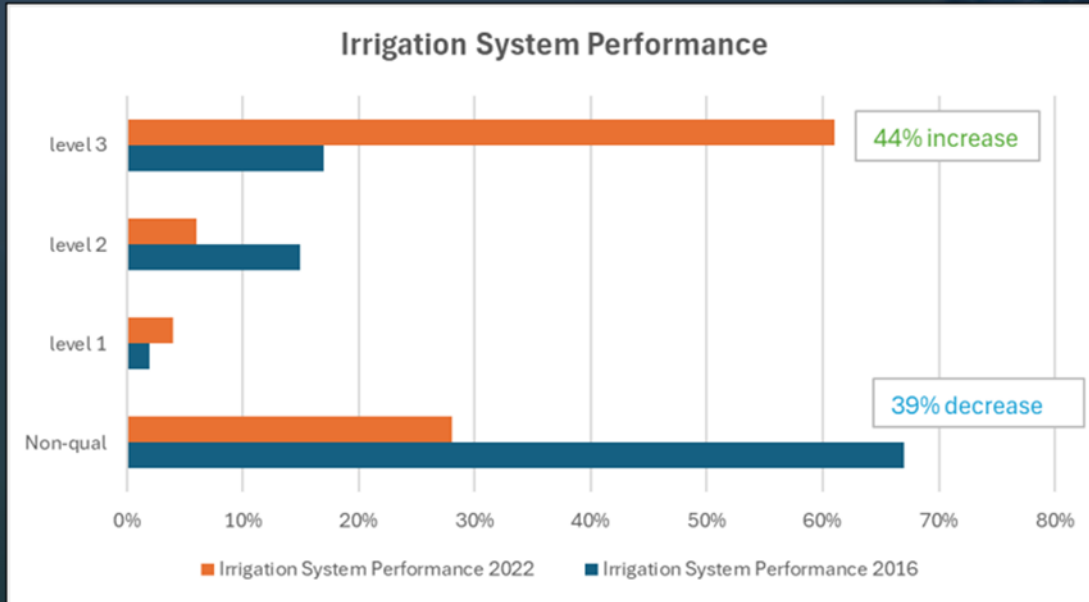


Reducing the water needed to grow other feed *crops*

Hulls can replace alfalfa hay pound for pound in up to 20% of dairy feed formulations, reducing the acreage needed to grow it by 386,000 acres and **saving 440 billion gallons of water.**³



Growers using more precision



Growers doing their part

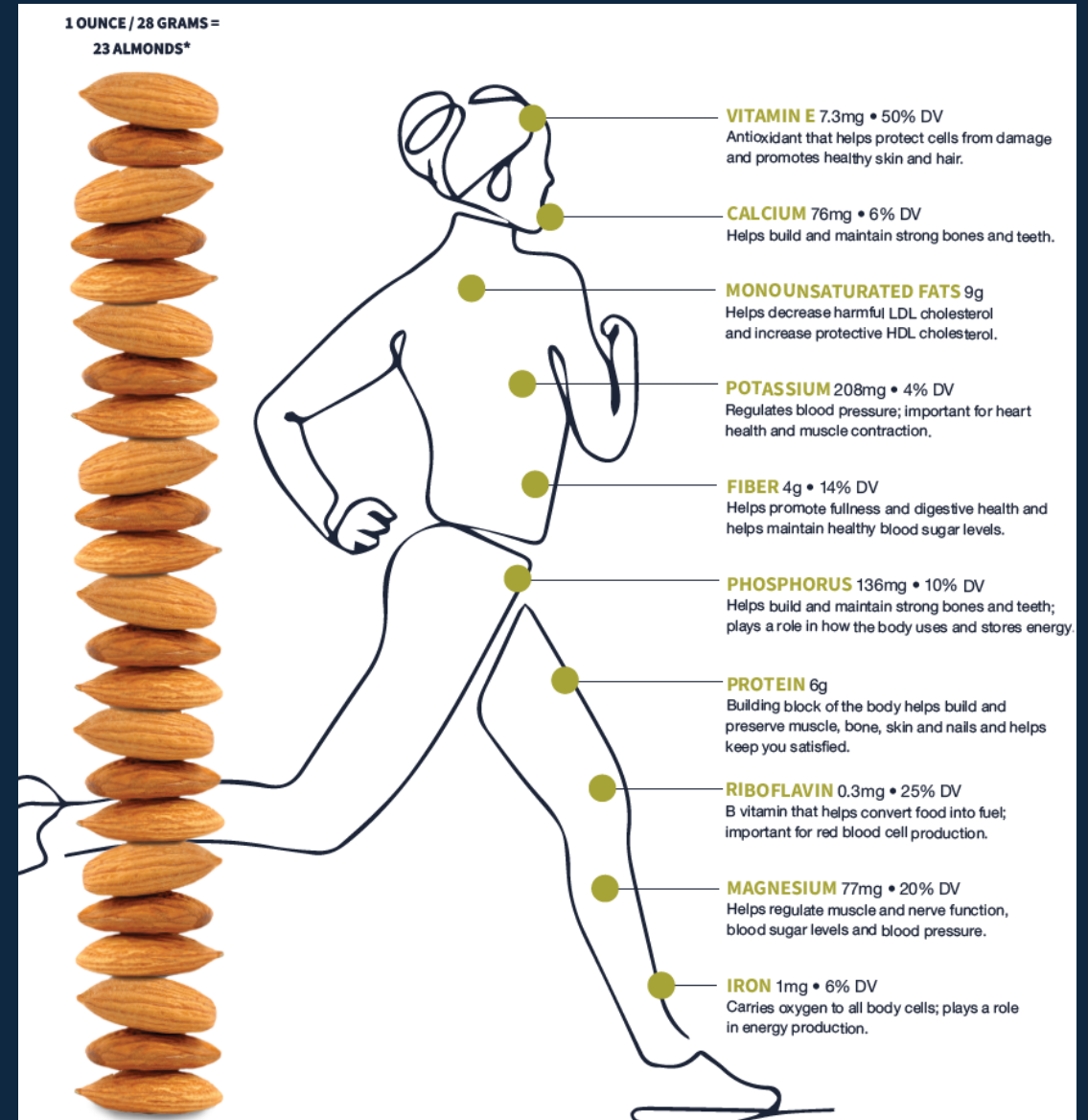
- Serving on GSAs
- Economic impact of fallowing land & decline land prices
- Recharging groundwater

Farm to the highest standards

- Regulation a double-edged sword
- California *the place* defining what sustainable water management looks like



Powerful nutrition with every drop to grow almonds





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Telling the Almond Sustainability Story

Speaker: Ashley Boren (Sustainable Conservation)



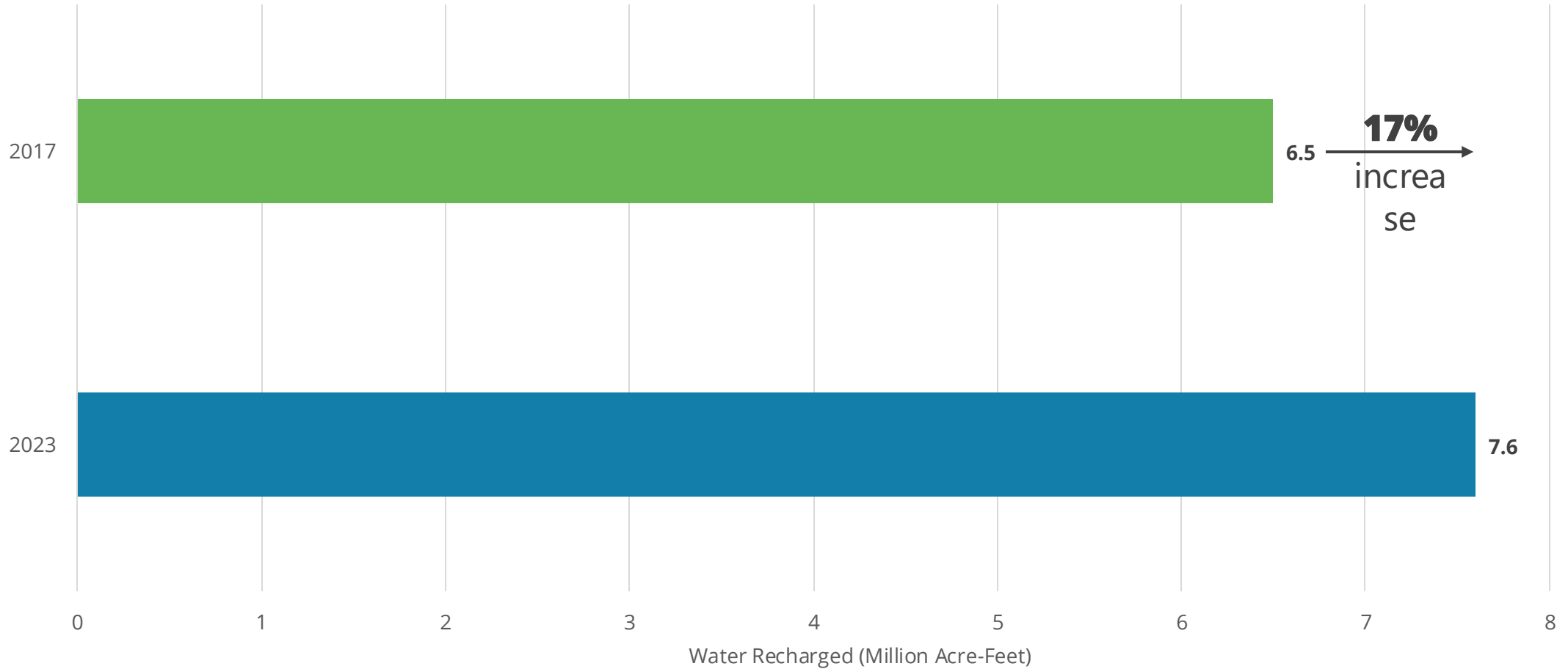
ALMOND BOARD OF CALIFORNIA



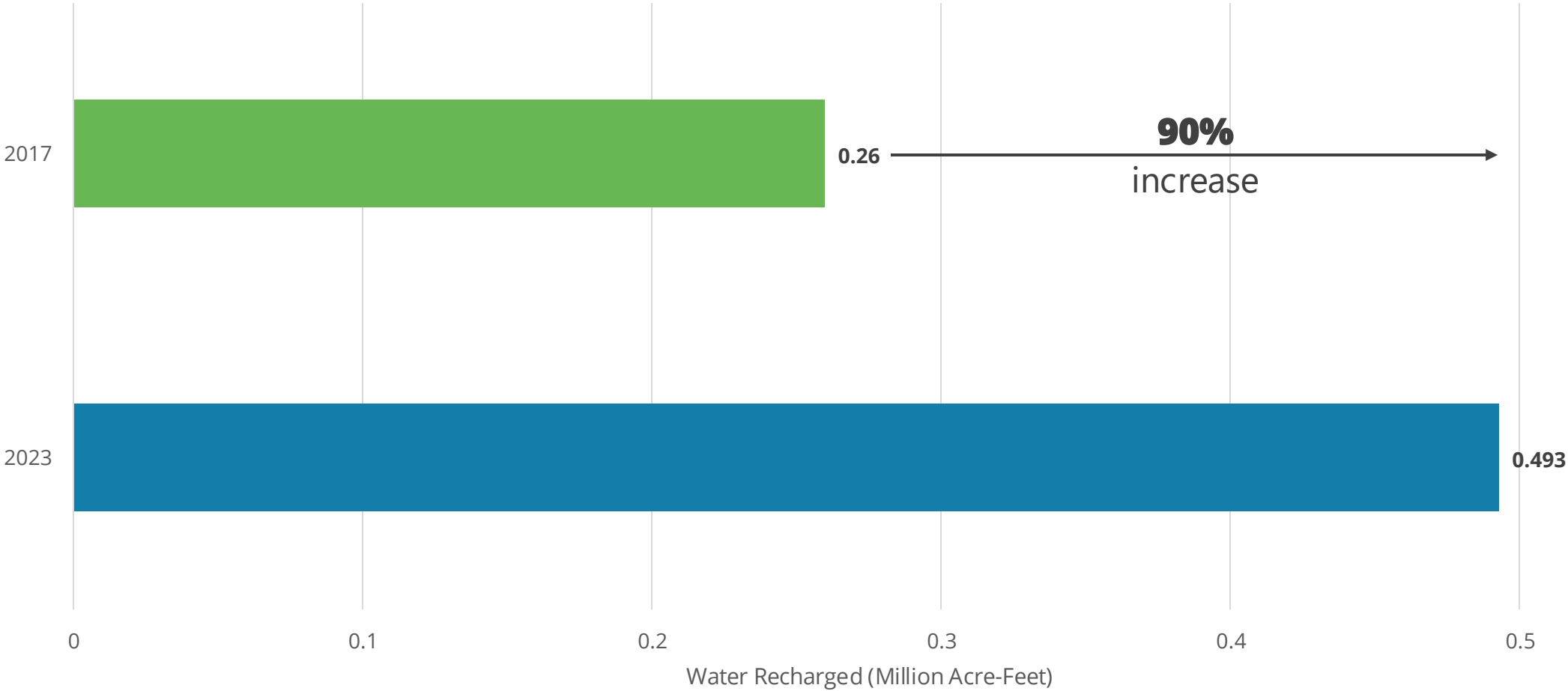
Flood Managed Aquifer Recharge (FloodMAR) in the SJV

Almond Board of California
Dec. 12, 2024

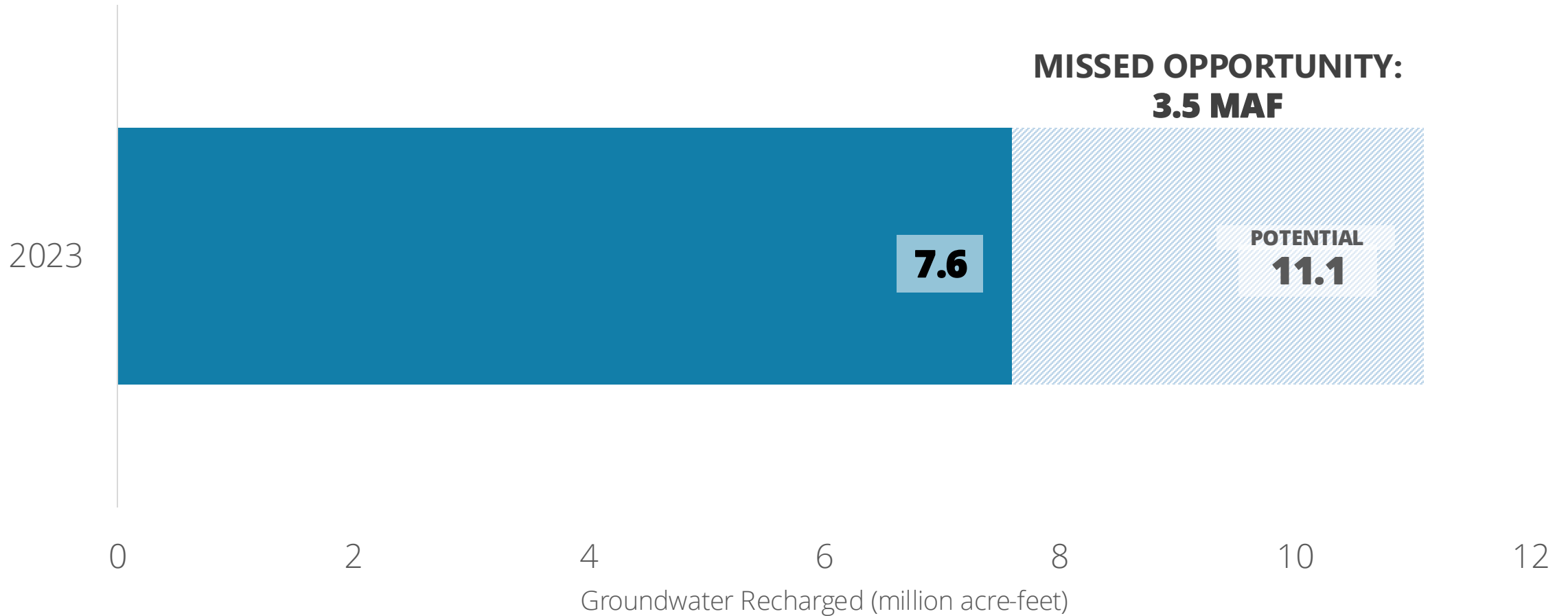
Total Recharge (Million Acre-Feet) across all Recharge Methods in the San Joaquin Valley in 2017 and 2023



Total On-Farm Recharge (Million Acre-Feet) in the San Joaquin Valley in 2017 and 2023



Total and Potential Groundwater Recharged in the San Joaquin Valley Across all Recharge Methods in 2023



Merced Flood-MAR Strategies and Projected Impacts

existing conveyance plus on-farm recharge



31%

reservoir operation + on-farm recharge



46%

conveyance expansion + on-farm recharge



63%

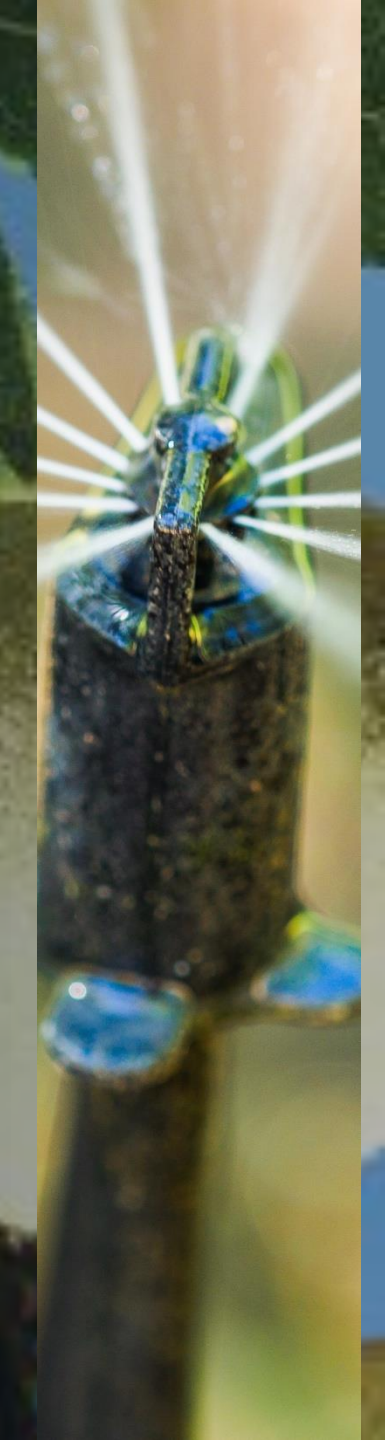
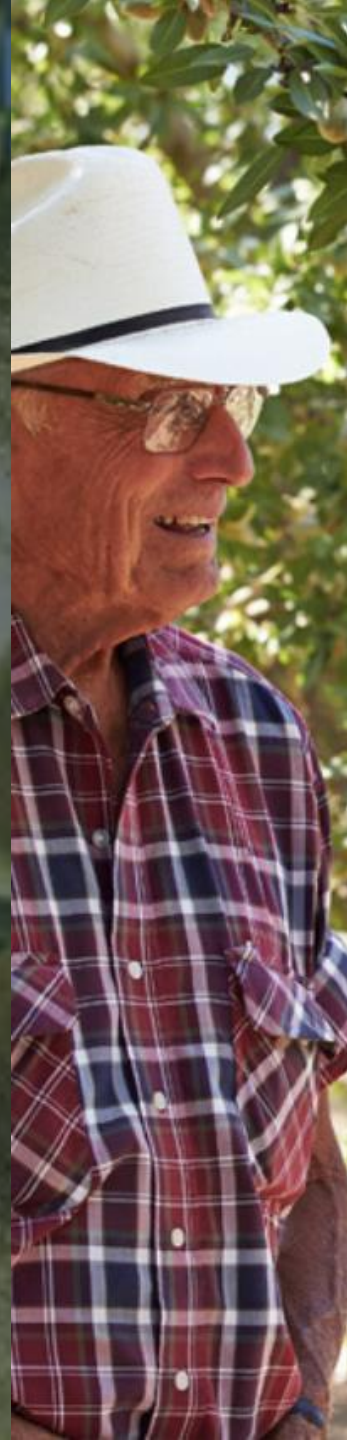
reduce flood flows by **65%**

percent of average annual overdraft recharged



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THANK YOU

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