

## ALMOND ORCHARD 2025 GOALS

ACHIEVING ZERO WASTE  
IN OUR ORCHARDS BY  
PUTTING EVERYTHING  
WE GROW TO  
OPTIMAL USE



### WORK IN PROGRESS:

THESE PROJECTS AND  
PRACTICES ILLUSTRATE  
THE CALIFORNIA  
ALMOND COMMUNITY'S  
COMMITMENT TO  
ZERO WASTE.

# ZERO WASTE



### I. WHOLE ORCHARD RECYCLING:

At the end of their productive lives, whole almond trees are ground up and incorporated back into the soil, a regenerative agriculture approach that improves soil health, boosts water efficiency, increases yields and reduces greenhouse gases<sup>1</sup>

### II. POULTRY FEED:

Almond hulls can feed animals big and small, and new research has found they are a source of good nutrients for chickens<sup>2</sup>. Further testing is underway to see if feeding antioxidant-rich hulls can combat a common disease in broilers and improve egg yolk composition from layers.

### III. SOIL AMENDMENTS:

A common practice in broccoli farming, plowing under plant remains after harvest, improves soil quality but can also leach nitrogen into the groundwater. New research shows that adding almond shells to the soil can immobilize that nitrogen as well as increase yields in subsequently planted crops<sup>3</sup>

### IV. RECYCLED PLASTICS:

Using a process known as torrefaction, almond shells can be transformed into a charcoal-like material and mixed with recycled plastics, making them stronger and more heat stable. If this can be scaled beyond the lab, it increases our ability to recycle existing plastic, resulting in less new plastic in the world!<sup>4</sup>

## CLIMATE-SMART AGRICULTURE

Finding ways to reduce our environmental footprint while adding value is at the heart of almond farming, ensuring farmers can grow a better future for their families, communities and the planet. So when we say zero waste, we mean using everything we grow to make the world a better place.

The nutritious almonds we eat grow in a shell, protected by a hull, on a tree—coproducts traditionally used for livestock bedding, dairy feed and electricity generation. With 85 studies funded to date, new research is exploring optimized uses where every byproduct is an input for another product or valuable in its own right.

Focusing on approaches that are a win-win for farmers and the planet, benefits of some ideas being explored are:

- Improving soil health by utilizing regenerative agriculture principles
- Addressing climate change by storing carbon in the soil
- Improving crop yields and water use efficiency
- Protecting groundwater quality
- Offsetting the need to grow other crops (and thus reducing the resources needed to grow them)

## CARBON SEQUESTRATION

Farms that use whole orchard recycling sequester 2.4 tons of carbon per acre<sup>1</sup>...



...equivalent to living car-free for a year<sup>5</sup>



Document #2020CN0134  
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### MEET MANUEL CONDE

ALMOND FARMER, OAKDALE, CA

"I believe everything you take to grow a tree needs to be put back into the earth. Whole orchard recycling is better for the earth, meaning I can leave it better for the next generation."



1. Emad Jahanzad, et al. Orchard recycling improves climate change adaptation and mitigation potential of almond production systems. PLoS ONE. March 2020. 2. Woo Kyun Kim, et al. Effect of almond hull as an alternative ingredient on broiler performance and nutrient digestibility. Poultry Science Association 108th Annual Meeting. 2019. 3. Joji Muramoto, et al. Mobilizing mineralized nitrogen from cole crop residues using organic amendments. Final report to California Specialty Crop Block Grant Program. 2019. 4. Zach McCaffrey, et al. Recycled polypropylene-polyethylene torrefied almond shell biocomposites. Industrial Crops and Products. 2019. 5. Seth Wynes, et al. The climate mitigation gap: education and government recommendations miss the most effective individual actions. Environmental Research Letters. 2017.