



SOIL HEALTH BOTTOM LINE PROGRAM

JUNE 2024

A Soil Health Farmer Profile

Vicky Garcia-Moya, Eco-Family Farms

Vicky Garcia-Moya and her husband Alberto E. Moya grow almonds on 29 acres near Chowchilla, California. Their land has sandy loam soils in a productive agricultural area. In 2002, the Moyas purchased their farm, and in 2010, they planted an almond orchard near a small pasture and an acre of fruit trees. The Moyas hired another grower to farm the orchard but later took over to reduce costs and have better orchard management control.

They established Eco-Family Farms in 2012. Vicky completed an organic farming course at Agriculture and Land-Based Training Association (ALBA), along with training on direct marketing and regenerative agricultural practices that improve soil health, conserve water, enhance biodiversity, and build sustainability.

Initially, the Moyas faced financial and farm management challenges. They hired out much of the work due to a lack of equipment and off-farm job commitments. But, they learned the orchard suffered when tasks were not performed timely. So, they purchased equipment, and in 2016, Vicky left her retail sales job to become a full-time farmer. This reduced costs and generated more productive trees. They also started selling flavored almonds online and at farmers' markets.

Vicky is now the farm's primary decision-maker and passionate about being a good land steward. She attended workshops on soil health, irrigation efficiency, and nutrient management. In 2015, she started planting cover crops, applying compost, mulching prunings, and altering nutrient management based on annual soil samples. Climate change has been challenging. Their region suffers from a long-term drought that significantly lowered the groundwater table. Many farmers have been affected, including them. In 2015, at considerable expense, they rehabilitated their irrigation pump and well to reach the deeper water table.

For this profile, AFT assessed financial costs and benefits from cover cropping, compost application,

mulching, and nutrient management. We estimated reduced greenhouse gas emissions. AFT hopes this information encourages more farmers to implement these practices.

Soil Health Practices and Challenges

Vicky plants cover crops after fall harvest; seasonal rainfall allows germination. Using a seed drill, she plants an 8-foot swath in alleyways with Soil Builder seed mix from Seeds for Bees. This non-profit helps farmers plant cover crops for bee habitats. As a grower member, Vicky receives grants to offset costs. The mix consists of triticale, bell beans, and winter peas.

Research has shown cover crops add biomass to the soil profile, which improves fertility, water retention, and organic matter content. Cover crops provide insect habitat, decrease runoff, erosion, and compaction, and suppress weeds. Vicky applies less insecticide and can enter the orchard for tractor operations sooner after heavy rains, which she attributes to cover crop adoption that allows greater infiltration. "When I'm digging the soil, I'm seeing a lot of earthworms," Alberto reports. "The soil looks and feels better."

For nutrient management, Vicky tests soil regularly to guide fertilizer usage. She integrated compost applications and mulching to suit her soil and plant needs. A blend of composted manure and green waste are applied at a rate of 3 tons/acre each year. Compost is rich in nutrients that are released slowly to plants, enhancing soil biodiversity and available nutrients. Annual winter prunings are mulched with a large self-propelled flail mower, which spreads wood chips back onto the surface. This mulch adds organic matter to the soil, providing benefits like compost.

Efficient irrigation application is an important conservation practice alongside the soil health practices being analyzed. Vicky switched from a micro-sprinkler to a double-drip irrigation system

Key Facts

COUNTY: Madera, California

WATERSHED: Chowchilla River

CROPS: Almonds

FARM SIZE: 29 acres

SOIL: Sandy loam

REGENERATIVE FARMING PRACTICES: Cover crops, compost, mulching, & nutrient management

American Farmland Trust's **SOIL HEALTH BOTTOM LINE PROGRAM** supports research and on the ground programs that assist in the protection of California's diverse farms and ranches. AFT's Soil Health Bottom Line Program supports on-farm research that showcases the economic and environmental benefits of using soil health practices.



in 2016 to improve application uniformity and allow for irrigation during harvest. Vicky will install soil sensors to monitor the soil moisture more accurately.

Vicky works towards the farm’s profitability and sustainability despite climate change challenges. Some years, implementing regenerative practices hasn’t been easy. In 2019, she couldn’t access and apply compost due to price and supply constraints. Rapidly rising fertilizer costs affected profits negatively, so she constantly changes fertilizer types and rates to find a balance between nutrient effectiveness and affordability. After eight years of regenerative agricultural practices, her soil and trees are more vibrant, healthy, and vigorous despite the challenges.

Economic, Water Quality, and Climate Benefits

The T-Chart table presents estimated financial benefits and costs of adopting nutrient management, cover crops, mulching,

and compost application. The improved soil health conditions paid off for the farm. The largest cost savings (reduced cost) was a decrease in insecticide and herbicide use by \$50/ac/yr and \$15/ac/yr, respectively. Vicky estimated a \$25/ac/yr cost savings for both (1) earlier access to the field and (2) decreased water use due to improved infiltration, drainage, and water-holding capacity. She attributed a 10% increase in crop yields due to regenerative practices, comparing 2016-2018 and 2019-2023 average almond yields, resulting in a \$309/ac/yr increase in revenue. The cost of cover crop, compost, and mulching increased overall costs by \$140/ac/yr. In summary, the T-Chart analysis shows an increase in net income of \$284/acre/year, a total increase of \$8,236/year.

To estimate climate benefits, USDA’s COMET-Planner Tool estimated regenerative farming practices reduced 178 metric tonnes CO₂ equivalent/yr emissions, equal to the carbon sequestered by 208 acres of forested land in one year.

Closing Thoughts

The Moyas are passionate about implementing regenerative practices that sustain the land. Vicky takes pride in selling the public sustainably grown almonds. “As a full-time farmer, I work this orchard daily,” she says. “I’m constantly learning better, more environmentally friendly ways to grow our crops. We have faced challenges, but the land is definitely improving each year.”

American Farmland Trust utilized the following technical tools to quantify the economic and environmental benefits of regenerative farming practices implemented on Eco-Family Farms: NRCS’s Level III T-Chart and USDA’s COMET-Planner.

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T-CHART: BENEFIT & COST ANALYSIS FROM IMPLEMENTING REGENERATIVE PRACTICES

ECO-FAMILY FARMS	
Madera County, CA • June 2024	
RESOURCE CONCERNS	
29 acres of almonds planted in 2010	
Resource concerns include soil compaction, poor water infiltration, poor water retention, and nutrient cycling.	
POSITIVE EFFECTS	
REDUCED COSTS	\$/AC/YR
Decreased insecticide use (50% reduction) as a result of cover crops	\$50
Decreased herbicide use (40% reduction) as a result of cover crops	\$15
Benefit from earlier field access after rains as a result of cover crops decreased fungicide applications	\$25
Decreased water use (10% reduction) due to improved soil health	\$25
Total Reduced Costs	\$115
INCREASED REVENUE	\$/AC/YR
Increased almond yield due to soil health practices (10% increase) (Comparison of average yields during 2016–2018 to average yields during 2019–2023, based \$2.15/lb ave. almond prices)	\$309
Total Benefits = \$424/ac/yr	\$424
SOIL HEALTH PRACTICES	
Cover Crops—began in 2015	
Compost Application—began in 2015	
Nutrient Management—began in 2014	
Mulching—began in 2015	
NEGATIVE EFFECTS	
INCREASED COSTS	\$/AC/YR
Cover Crop costs	
• Seed—20#/acre	\$20
• Planting equipment & labor	\$15
Compost Costs	
• 3 tons/ac composted manure & green waste blend	\$63
• Application—custom hire	\$25
Mulching	
• Custom hire	\$17
Total Increased Costs	\$140
DECREASED REVENUE	\$/AC/YR
None identified	\$0
Total Costs = \$140/ac/yr	\$140
\$424/yr Total Benefits - \$140/yr Total Costs = \$284/ac/yr Net Benefits	
Change in Net Income Per Acre = \$284/ac/yr	
Change in Total Net Income = \$8,236/yr	

References:

This table represents estimated average costs and benefits reported by the producer Vicky Garcia-Moya, with her adoption of cover crops, composting and mulching. Prices are stated as per acre values. Almond price used: Almond \$2.15/lb (USDA NASS Quick Stats 2022)

Almond price used: Almond \$2.15/# (USDA NASS Quick Stats, 2022)
 NRCS Level III T-Chart, Soil Quality Improvement
 NRCS Economics Technical Note No.: TN.200.ECN-1