



Soil Health Economic Case Study

Jimmy Simonian, Baxter Ranch

Jimmy Simonian of Baxter Ranch is a participating walnut farmer in East Stanislaus Resource Conservation District's (ESRCD) **Integrated Soil Health Practices in California Orchard Systems** project. From 2021 to 2025, four cover crop and compost comparison trials were conducted in almond and walnut orchards throughout the Northern San Joaquin Valley to address resource concerns, including compaction, poor water infiltration, and low soil organic matter content.

Funding is made possible by a Natural Resources Conservation Service (NRCS) Conservation Innovation Grant (CIG). Partners in this project include UC Merced, Community Alliance of Family Farmers, Project Apis m., and American Farmland Trust.

Jimmy is a fourth-generation farmer whose family grows walnuts, grapes, citrus, and a variety of stone fruits in Fresno County. Farming 300 acres, Jimmy embraces regenerative farming methods to build soil health, conserve water, and support vibrant crops on the farm's sandy loam soils.

Jimmy says, "Before the trial, I was fairly new to cover crops and compost, but we have been practicing reduced tillage, irrigation, and nutrient management for years, so I wanted to learn more and see its effects on the soil and the trees."

This **Soil Health and Economic Case Study** describes the economic and climate impacts on Baxter Ranch's three-year adoption of regenerative practices, namely compost application and cover crops on a **20-acre Treatment** orchard compared to a nearby **15-acre Control** orchard, which was not cover-cropped.

ESRCD's trial objective is to explore and quantify the effects of compost and cover crops on soil health and economic impacts. The findings will be shared with the agricultural community to inform and encourage greater adoption by farmers.

Cover Crop Management

Cover crops are known to improve water infiltration, water-holding capacity, soil structure, and porosity. Weed suppression is evident, and farmers report reduced runoff and erosion. In addition, cover crops provide beneficial insect habitat, which enhances predator populations that can limit pest damage.

In the Treatment orchard, Jimmy planted a multi-species "Bio Build 3" mix each Fall from 2021 to 2023. Seeds were provided by Project Apis m., a beekeeper and farmer collaborative. The blend consists of bell beans, winter peas, triticale, mustard, radish, and canola. Robust and growing to four feet tall in the Spring, the plants add biomass, and the root systems fix nitrogen and penetrate compacted soil layers.

ESRCD staff provided technical assistance and recommended a typical seeding rate of 60lb. per acre, at a cost of \$50 per acre. Planting costs were \$12 per acre.

Jimmy says cover cropping is a commitment. There are costs to work the soil before seeding, an extra mowing pass, and possible irrigation during dry years. But the improvement in soil health is observable.

Compost Application

Compost also improves soil health. Rich in nutrients, it accelerates soil microbial activity, leading to greater nutrient cycling (nutrient availability). In the Treatment orchard, 8 tons per acre of composted green waste was applied annually from 2021 to 2023. The cost was \$28 per ton for the material and \$25 per acre for spreading, for a total of \$249 per acre per year. The Control orchard was managed in its baseline condition and did not receive compost.

Farm at a Glance

COUNTY: Fresno, CA

WATERSHED: Tulare Basin

CROPS: Walnuts

TRIAL SIZE: 35 acres

SOIL: Sandy Loam

REGENERATIVE PRACTICES:

- Cover cropping
- Compost application
- Nutrient Management
- Irrigation Management

Farmers are dealing with water allocations, high fertilizer and input costs, and low crop prices. I believe that sustainable practices conserve water and give life to the soil and are the solution to staying in business in the long run.

—JIMMY SIMONIAN

Nutrient Management

Jimmy brings a scientific and analytical approach to growing crops. He experiments with biochar amendments and micro-nutrients, and he modified application equipment to improve fertilizer placement. “I think about soil chemistry and plant nutrition to grow the most productive crop possible while improving the soil. I try to avoid getting boxed into traditional methods that aren’t sustainable.”

Climate Benefits

USDA’s COMET-Planner Tool was utilized to estimate the climate benefits associated with the farm’s soil health practices.

Implementing compost, cover crops, reduced tillage, and nutrient management results in an average reduction of 133 metric tons CO₂ equivalent, equal to the carbon sequestered by 133 acres of US forest in one year.



The Bottom Line

A **Partial Budget Analysis** (PBA), displayed in a T-Chart, was used to analyze the

marginal benefits and costs of adopting cover crops and compost in the treatment acreage. We used published machinery and materials costs and producer-provided data to estimate the cost of operations compared to the control orchard.

This study estimates a net revenue gain of **\$7 per acre per year** over the trial period. Jimmy notes, “We only applied the practices for 3 years, so we had just a snapshot of yield data. And in 2022 we had extreme high temperatures that drastically cut yields.”

Closing Thoughts

Jimmy explains, “I believe in breaking up the traditional monoculture of one crop all year. The cover crop does that by adding vegetation, plant life, and microbial activity, which I think is key to sustaining the soil and growing productive crops.”

T-CHART: BENEFIT & COST ANALYSIS FROM SOIL HEALTH PRACTICES

BAXTER RANCH			
RESOURCE CONCERNS/BENCHMARK CONDITION		SOIL HEALTH PRACTICES, 2021-2023	
35 acres of Walnuts planted 1995		Treatment 20 acres:	
Resource concerns include low soil organic matter content, poor nutrient cycling, soil compaction, poor water infiltration, and poor water retention		8 tons/ac greenwaste compost annually 60lb/ac cover crop mix (PAm BioBuilder) annually	
Control 15 acres: No cover crop or compost applied			
POSITIVE EFFECTS		NEGATIVE EFFECTS	
REDUCED COSTS	\$/AC/YR	INCREASED COSTS	\$/AC/YR
Fertilizer costs—no reduction through 2023		Cover Crop costs:	
Irrigation/water savings	\$16	• Seed—60lb/acre annually	\$50
Mowing—no reduction through 2023		• Planting equipment & labor	\$12
Herbicides savings	\$20	• Light tillage/soil prep for seeding	\$25
		Compost Costs	
		• 8 tons/ac greenwaste annually x \$28/ton	\$224
		• Application x \$20/ac	\$20
Total Reduced Costs	\$36	Total Increased Costs	\$356
INCREASED REVENUE	\$/AC/YR	DECREASED REVENUE	
Walnut yield improvement 15% attributed to cover crops/compost	\$273	None identified	
Total Benefits = \$309/ac/yr	\$309	Total Costs = \$356/ac/yr	\$356
\$309/ac/yr Total Benefits - \$356/ac/yr Total Costs = -\$47/ac/yr Net Benefits			
Change in Net Income Per Acre = -\$47/ac/yr			

This table represents estimated average costs and benefits reported in 2025 dollars by the producer over the 35 acre study area. • American Farmland Trust utilized the following tools to quantify economic and environmental benefits of soil health farming practices: NRCS’s Level III T-Chart analysis to produce cost and benefits and USDA’s COMET-Planner to estimate climate benefits. • Walnut price average \$0.70/lb. • Funding for this case study was possible by a US Department of Agriculture Conservation Innovation Grant #NR203A750008G013. Its contents are solely the responsibility of the authors and do not necessarily represent the official view of the USDA. • Authored by Paul Lum, AFT Sr. Agricultural Specialist.

For more information about this study or to discuss soil health practices, please contact

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To read more case studies, visit <https://farmland.org/soil-health-in-california>

For USDA’s COMET-Planner Tool, see <https://comet-planner-cdfahsp.com>