NOVEMBER 2025

Soil Health Economic Case Study

Wes Sperry, Sperry Farms

Wes Sperry is a participating almond farmer in East Stanislaus Resource Conservation District's (ESRCD) **Soil Health Management Systems for Orchards in California's Central Valley** project. Funded by a Natural Resources Conservation Service (NRCS) Conservation Innovation Grant (CIG), the project addresses regional resource concerns such as low soil organic matter content, compaction, poor water retention, and poor nutrient cycling.

During 2021–2025, four cover crop and compost **comparison trials** were conducted in almond and walnut orchards throughout the Northern San Joaquin Valley.

Wes's orchards are on sandy loam soils atop slightly rolling hills in Stanislaus County. A fifth-generation farmer, Wes's family started growing dry-land wheat in the 1850s. Once irrigation water was available, the family established vineyards and orchards. The land is now planted to almonds under a combination of organic and conventional production. Crop sales are achieved through direct sales on the farm's website and from bulk sales to commodity buyers.

Wes is an innovative farmer who deploys regenerative farming methods to improve soil health, water retention, and biodiversity. Wes explains, "Our long-term goal is to maintain vigorous trees, improve our soils, reduce inputs, and increase the bottom line." Wes is also involved in the local agricultural community and hosts numerous conservation and educational events on his farm.

This **Soil Health and Economic Case Study** describes the economic and climate impacts on Sperry Farm's adoption of cover crops and compost application on a **50-acre Treatment plot** compared to an adjacent **25-acre Control plot**, which was also cover cropped but received 50% less compost. ESRCD's partners in this effort include UC Merced, Community Alliance with Family Farmers, Project Apis m., and American Farmland Trust. The field trial objective is to better understand the effectiveness of the soil health practices, quantify the benefits, and share the findings with the agricultural community to inform and encourage greater acceptance.

Cover Crop Management

Wes planted cover crop seeds each fall from 2021 to Fall 2024 on both orchards. Project Apis m., a beekeeper and farmer collaborative, provided the "BioBuild 3" seed mix. Species include 35% bell beans, 30% triticale, 28% peas, 3% yellow mustard, 3% daikon radish, and 1% canola. Plant diversity extends the timing of emergence, bloom, and growing periods and adds nitrogen fixation, planting date flexibility, and resiliency to weather conditions. The seeding rate was 60 lb./ac at a cost of $50/ac. Planting costs were $12 per acre. Cover cropping is a regular practice for Wes and is adopted on all of the farm's acreage.

Compost Application

For the trial, the Treatment 50 acres received 16 tons of green waste compost per acre annually from 2021–2025, and the Control 25 acres received 8 tons per acre annually. When the trial began in 2021, Wes was already planting cover crops and applying 5–8 tons per acre of compost to build soil nutrition. This project allowed a study of the benefits of a greater application rate. The cost was $28 per ton for the material and $25 per acre for custom-hire application.

Other Regenerative Practices

Wes values a whole-farm holistic approach to managing the family's land. Wes practices nutrient management through regular soil and leaf tissue sampling to guide fertilizer application. Micro-

Farm at a Glance

COUNTY: Stanislaus, CA

WATERSHED: San Joaquin River

CROPS: Almonds

TRIAL SIZE: 50 acres

SOIL: Sandy Loam

REGENERATIVE PRACTICES:

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

Overall, the trees are more productive, soil conditions have improved, inputs are reduced and we are creating a safe working environment. I believe we are giving back to the land as my family found it years ago.

—WES SPERRY

nutrients and compost inoculates are added to build soil nutrition. Soil moisture sensors are in place to guide irrigation scheduling in order to accurately meet the crop water demand while avoiding over-watering and runoff. To establish pollinator habitat Wes planted hedgerows and he installed numerous owl boxes to help control rodents without the use of pesticides

Climate Benefits

To estimate the climate benefits associated with the farm's soil health practices, USDA's **COMET-Planner** tool found that adding cover crops, compost, hedgerows, and no-till operations results in an average reduction of 329 metric tons CO_2 equivalent, equal to the carbon/yr, corresponding with the carbon sequestered by 330 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, which received a 50% lower rate of compost per acre.

This study estimates a net revenue gain of **$7 per acre per year** over the trial period. Wes explained that yields in the treatment benefited only slightly (8% attributable to additional compost) due to its location on more productive soil and flatter terrain compared to the control orchard. However, compost is well-documented to improve soil health in the long term and Wes expects to experience continued yield gains in the future.

Closing Thoughts

Wes's approach to farming and land stewardship stems from a firm belief in the value of healthy soils and a sustainable environment. Wes says, "Over the years, we transitioned to a holistic approach. Margins are extremely thin, but despite the extra costs, we are committed to practices that sustain the land with an eye toward better yields."

T-CHART: BENEFIT & COST ANALYSIS FROM ADDITIONAL COMPOST

SPERRY FARMS

RESOURCE CONCERNS/BENCHMARK CONDITION (2021)	SOIL HEALTH PRACTICES
Soil compaction, poor nutrient cycling, water infiltration, water retention	75 acres of organic almonds planted 2014
	Treatment: 50 acres • 20 tons/ac greenwaste compost annually • 60#/ac cover crop mix (Pam BioBuilder)
	Control: 25 acres • 10 tons/ac greenwaste compost applied annually • Cover crop mix, 60# Pam Soilbuilder

POSITIVE EFFECTS

REDUCED COSTS	$/AC/YR
Fertilizer costs—no reduction through 2024	
Irrigation/water—no reduction through 2024	
Total Reduced Costs	**$0**

INCREASED REVENUE	$/AC/YR
Almond yield, 8% attributed to additional compost	$256

Total Benefits = $256/ac/yr	**$256**

NEGATIVE EFFECTS

INCREASED COSTS	$/AC/YR
Compost costs: • 8 tons/ac greenwaste annually x $28/ton • application—custom hire	 $224 $25
Total Increased Costs	**$249**

DECREASED REVENUE	
None identified	

Total Costs = $249/ac/yr	**$249**

$256/ac/yr Total Benefits – **$249**/ac/yr Total Costs **= $7/ac/yr Net Benefits**

American Farmland Trust utilized the following tools to quantify economic and environmental benefits of regenerative farming practices: NRCS's Level III T-Chart analysis to produce costs and benefits and USDA's COMET-Planner to estimate climate benefits. This table presents estimated average costs and benefits from the adoption of additional compost application across the 50-acre study area. • Values are in 2025 dollars. Almond price determined by the average 2022-2025 $2.00/lb. (USDA NASS Quick Stats) • Funding for this analysis and case study was made 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
Paul Lum, American Farmland Trust, Sr. Agricultural Specialist at Plum@farmland.org
or NRCS and East Stanislaus Resource Conservation District, 3800 Cornucopia Way Modesto, CA (209) 287-3672
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