



SOIL HEALTH BOTTOM LINE PROGRAM

DECEMBER 2023

A Soil Health Farmer Profile

Ybarra Farms

Ybarra Farms grows citrus trees on its 16-acre orchard in Lindsay, Tulare County, California. The farm was bought in 2012 and was originally planted with pomegranate trees. In 2018, Ybarra Farms removed the pomegranate trees and replaced them with oranges. The farm is located on Exeter Loam soil with flat, 0 to 2% slopes. This soil is characterized as being well-drained, with a depth of more than 80 feet to water.



This citrus orchard is committed to incorporating regenerative farming practices like irrigation management, nutrient management, compost application, and renewable energy. To help Ybarra Farms adopt these growing practices, it has participated in different California programs that offer financial assistance to implement these regenerative practices.

In 2015, the farm applied for a Rural Energy for America (REAP) from the United States Department of Agriculture (USDA), which allowed it to obtain financial assistance for the installation of renewable energy (solar panels) for his farm. REAP covered 25% of the total cost of the solar panels. The total cost was \$32,000, thus \$8,000 of the cost was paid for by REAP. Then Ybarra Farms received a bank loan for the remaining 75% (\$24,000) at an interest rate of 5%. The solar panel installation resulted in an additional reduction in his water pump electricity bill – an estimated \$2,803/yr savings based on the total \$4,800/yr savings.

In 2019, Ybarra Farms applied to the State Water Efficiency & Enhancement Program (SWEET), offered by the California Department of Food and Agriculture (CDFA). The SWEET grant covered 100% of the cost to install soil moisture sensors at three depths in one location—a value of \$1,200 for the equipment and installation and the initial \$300 annual software subscription for automated measurements. The soil sensor technology lets the farm monitor the soil's water levels after each irrigation, as well as the soil's water-retention capacity. As a result, the farm can avoid over-irrigating while maintaining adequate soil moisture levels throughout the growing season.

The farm is grateful to already see reductions in its irrigation costs by using this water-saving technology on the orchard. This irrigation management practice reduced the orchard's water application from 12 acre-feet to 7 acre-feet during the growing season based on Ybarra Farms' water use records and electricity bill, resulting in an estimated \$1,196/yr savings in the water pump electricity bill.

In 2023, Ybarra Farms applied to the CDFA's Healthy Soil Program (HSP) for compost application financial assistance. Farm management wanted to apply compost to the orchard fields as a supplemental fertilizer to meet the demands of its maturing trees and to improve the soil health by increasing microbial activity, nutrient availability, soil moisture retention, and enhanced soil structure. Compost was applied at a rate of 8 tons/ac and the HSP paid 100% of the cost, worth \$2,336, while it cost Ybarra Farms approximately \$600 to spread the compost. The COMET-Planner tool estimates that the composted manure applied to the orchard resulted in a reduction of 72 metric tons of CO₂-equivalent per year, corresponding to taking 16 cars off the road for one year.

Key Facts

COUNTY: Tulare, California

WATERSHED: Tulare Basin

CROPS: Citrus

FARM SIZE: 16 acres

SOIL: Exeter Loam

REGENERATIVE FARMING PRACTICES: Compost application, nutrient management, irrigation water management, and renewable energy

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.

Final Thoughts

Ybarra Farms is passionate about continuing to improve its orchard’s soil health, while conserving water and energy. The farm understands these regenerative practices will help keep its operations remain climate resilient and viable in the years to come, so it’s pleased with the economic and environmental gains from these investments.

These funding programs made it more economically feasible for Ybarra Farms to invest in these practices. That is why the

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

Funding for this analysis and case study was made possible by the U.S. Department of Agriculture’s (USDA) Agricultural Marketing Service through grant 21SCBPCA1002. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.

Authored by Harol Gallardo, AFT California Agricultural Specialist.

farm encourages other California farms to apply for these programs at the next opportunity, so they can start reaping these benefits as well.

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

YBARRA FARMS	
Tulare County	
July 2023	

BENCHMARK CONDITIONS/RESOURCE CONCERNS	
16 acres of oranges planted in 2018	
Resource concerns include over-watering, high energy consumption, poor water retention, and nutrient cycling	

POSITIVE EFFECTS	
REDUCED COSTS	\$/YR
Electricity savings <ul style="list-style-type: none">Solar panel installation resulted in a reduced electricity bill¹	\$2,803
Irrigation savings <ul style="list-style-type: none">Reduced water applied from 12 acre-feet (af) to 7 af due to soil moisture sensor monitoring²	\$1,997
Total Reduced Costs	\$4,800

REGENERATIVE PRACTICES	
Soil moisture sensors	
Compost application	
Implementation of renewable energy (solar panels)	

NEGATIVE EFFECTS	
INCREASED COSTS	\$/YR
Solar Panels <ul style="list-style-type: none">75% of total cost annualized over a 10-yr period at 5% interest rate (25% covered by REAP)¹	\$3,054
Soil moisture monitoring <ul style="list-style-type: none">Soil moisture sensors (\$1,200 covered 100% by CDFA SWEEP)²Sensor maintenance and monitoring laborSensor telemetry annual subscription	\$0 \$200 \$300
Compost Application <ul style="list-style-type: none">Material (\$2,336/yr covered 100% by CDFA HSP)³Spreading equipment & labor (5.3 hours/year)	\$0 \$600
Total Increased Costs	\$4,145

\$4,800/yr Total Benefits – \$4,145/yr Total Costs = \$655 Net Benefits	
---	--

1 Rural Energy of America Program (REAP) from the United States Department of Agriculture (USDA) grant paid 25% of the solar panels and installation. The electricity savings due to solar panels is estimated as 58% of Antonio’s total reduction in his water pump electricity bill. To learn more about the REAP, visit rd.usda.gov/programs-services/energy-programs.

2 State Water Efficiency & Enhancement Program (SWEEP) from the California Department of Food and Agriculture (CDFA) grant covered the initial cost of the soil moisture sensors (\$1,200), but the annual cost of maintenance, labor, and software subscription is covered by Antonio. The irrigation savings due to soil moisture sensors is estimated as 42% of Antonio’s total reduction in his water pump electricity

bill because he reduced his water use from 12AF to 7AF. To learn more about the SWEEP, visit cdfa.ca.gov/oefi/swEEP.
3 California Department of Food and Agriculture’s Healthy Soils Program covered 100% of the compost material costs, while Antonio paid out of pocket for spreading the compost. To learn more about the HSP, visit cdfa.ca.gov/oefi/healthysoils.