

Sustainable Orchard - Progress Report

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Project Manager Name

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Requested Metrics

Water Saved: Approximately 4,400 gallons collected via rainwater harvesting since October 2025, plus an additional 50/100 gallons saved through zone-separated irrigation. A cumulative total of over 20,000 gallons has been saved . Produce Donated: 7.8 lbs of greenhouse-grown cucumbers donated to Campus Pantry this cycle, with an additional crop still awaiting harvest.

Upcoming Harvest: A large peach and apricot harvest is expected within two weeks and will be donated to Tucson Village Farm.

Citrus Harvest: Citrus trees were the only trees affected by winter weather conditions and did not produce a harvestable crop this cycle. All other trees remained healthy.

Trees in Production: 10 total (8 pre-existing, 1 tree died, 3 newly planted this cycle).

Project Accomplishments

All three new trees have been successfully planted, consisting of two citrus trees and one apricot tree. Planted during winter, frost protection was implemented through the use of frost cloths, which proved effective in shielding the trees with minimal structural damage. The trees are now actively growing and displaying robust flower sets, a strong indicator of a productive upcoming harvest season. The orchard site has been fully cleaned of weeds and debris, and beautification has been completed through the installation of paver circles around the base of each new tree and the addition of mulch. Materials consistent with previous phases of the project were selected to maintain a cohesive aesthetic throughout the orchard. The irrigation system has been expanded and separated into distinct zones to accommodate the differing water requirements of citrus and stone fruit trees. The new trees have been fully integrated into the system, which connects to both the rainwater collection tanks and a supplemental water supply, ensuring the orchard can be reliably irrigated regardless of rainfall levels. Soil moisture sensors have been obtained and successfully installed with the assistance of Tanner Conrad, the CEAC's primary sensor and technology specialist. The sensors are connected to a centralized monitoring system accessible via the computer located in the building adjacent to the sustainable orchard. Soil moisture data is now being collected and will be used to refine irrigation scheduling and reduce unnecessary water use across both tree categories. The double fence gates required by campus facilities have been installed, completing the perimeter fencing of the sustainable orchard. This secures the site, prevents fruit theft, and enables the orchard to be a more formal, accessible space for student involvement and community visits. Advertisement materials have been created but are waiting to be distributed until the beginning of the fall semester of 2026. Currently the main advertisement has been through word of mouth.

Next Steps

The Sustainable Fruit Orchard will continue operating and expanding beyond the close of this grant. The project was designed from the outset with long-term sustainability in mind, and a clear funding transition is in place to ensure its continuity without dependence on future mini grant support. Dr. Recsetar will teach an annual aquaponics short course, with proceeds used to fund the ongoing student manager position. Greenhouse operating costs will be partially covered through extension funding, with the remainder supported by the Biosystems Engineering department through an aquaponics course taught in the adjacent greenhouse. Day-to-day orchard care will be carried out by a combination of a paid student manager, interns, and volunteers recruited from Biosystems Engineering, Sustainable Plant Systems, and Plant Science programs.

Several permanent improvements were installed on campus through this grant and each will continue to be actively maintained and used. The orchard now contains nine fruit trees—six pre-existing and three newly planted, which will be maintained seasonally by the student manager and interns through established protocols for pruning, irrigation, fertilization, and pest management. Harvested fruit will be donated to the Campus Pantry and community partners such as Tucson Village Farm, with donation volumes expected to grow as the trees mature. The expanded, zone-separated irrigation system, connected to both the rainwater harvesting tanks and a supplemental water supply, will continue operating automatically with the student manager monitoring performance and adjusting thresholds seasonally. Soil moisture sensors, installed with the assistance of CEAC technology specialist Tanner Conrad, feed into a centralized monitoring system in the adjacent building and will be maintained by the student manager with ongoing technical oversight from Mr. Conrad. The perimeter fence and double gate, installed per campus facilities requirements, will be maintained as a permanent campus fixture, securing the orchard and providing utility access as needed. A permanent interpretive metal sign outside the orchard, featuring a QR code linking to the project website being developed by project manager Desmond Traynor, will remain in place as an ongoing educational resource for students, staff, and community members visiting the CEAC. The orchard site has ample space for incremental expansion as resources become available through future grants, donations, and departmental support. Dr. Recsetar and the project team view this initiative as a long-term living laboratory for sustainable agriculture research, student education, and community outreach. Findings from ongoing sensor data collection are expected to contribute to extension publications sharing replicable sustainable practices with producers and residents throughout Arizona.

Challenges Faced

The main challenges of this project surrounded the planting of the trees. The soil was very difficult to dig through so the process of planting trees was very time consuming and labor intensive. The second challenge faced was the failure of life support systems within the greenhouse housing the aquaculture system. While this was not an urgent threat to the lives of the trees within the orchard, it resulted in a significant amount of time and effort being redirected from the orchard to the recovery of all life support systems.

Media/Links

[The Life Aquaponic: How a student-led initiative is driving innovation](#)

Recommendations