

Compost Use Case Study

Weed Abatement and Soil Restoration

The Historic Orchard at Guadalupe River Park and Gardens

The Historic Orchard at Guadalupe River Park and Gardens is a 3.3-acre fruit orchard located between Coleman Avenue and West Taylor Street in San Jose adjacent to the Heritage Rose Garden and River Park trails. With very few working orchards left in the area, the orchard was established in 1994 as an exhibition dedicated to the agricultural history of fruit production in the Santa Clara Valley, once known as “The Valley of Heart’s Delight.” The Historic Orchard contains over 250 fruit trees representing the major products of the fruit orchards that drove the Santa Clara Valley economy through the 1930s and 1940s. Today, the orchard is maintained by volunteers from the Friends of Guadalupe River Park and Gardens. Fruit from the orchard, harvested by the volunteers, is donated to the Second Harvest Food Bank of Santa Clara Valley.

Uncovering Soil Issues in the Orchard

In 2006, after fungal disease was discovered in the adjacent Heritage Rose Garden, the volunteers requested the services of soil specialist and consultant Brian Debasitis of Mauby All Natural for the Historic Orchard. The orchard was exhibiting problems with weed encroachment. When Mr. Debasitis conducted his initial soil analyses, he found that the soil was either so dusty or so compacted that it was difficult even to take an adequate sample for testing. Since regularly tilled soil dries out easily, years of using a harrow in the orchard had created a poor environment for the microbial population necessary for fruit trees to thrive. In addition, the soil remained severely compacted exactly at the depth of the tiller’s reach, creating moisture management problems with infiltration, permeability, and water retention capacity. After adequate samples had been taken for analysis, lab tests revealed that the fungal levels in the orchard soil were even lower than those in the Heritage Rose Garden, which had been suffering significant plant losses over the period of several years. To make matters worse, the fruit trees, even more than the roses, prefer a fungal dominant soil, thriving in a symbiotic relationship called a mycorrhizal association with beneficial fungi.



Sheep Control Weeds at the Historic Orchard

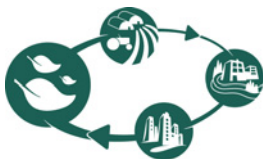
A Sustainable Treatment for a Healthier Orchard

Part of Mr. Debasitis' solution was to change orchard management practices. He had the City stop discing the soil, and introduced sheep in the Spring of 2008 to control the weeds. He also wanted to correct the mineral levels and establish a healthy soil environment for beneficial microbes and fungi. He began by top dressing the orchard with specially amended compost containing minerals and fungal mycelia to improve the soil chemistry and microbiology. For weed abatement, Mr. Debasitis would like to cover the entire orchard floor with a 3- to 6-inch layer of compost-enriched mulch. The mulch is made from City green waste at the Z-Best composting facility, and is composed of woody overs – the larger material sifted out after the composting process. Unfortunately, the process of spreading mulch is both time and labor intensive. It also requires handling enormous amounts of material, in this case over 800 cubic yards. Volunteers from the Friends of Guadalupe Park and River Gardens are now focusing on spreading mulch directly under the trees out to the drip line – the edge of laterally extending branches. At the same time, Mr. Debasitis will continue to apply compost tea enriched with humic acid to the orchard soil and mulch surfaces every six months to reestablish the soil microbe levels. He has also added mycorrhizal spores to compost tea and injected the soil at the roots of the trees to reestablish the levels of beneficial fungi. Currently Mr. Debasitis is in the process of establishing an appropriate understory growth of yarrow, clover, and poppies to reduce soil compaction, improve soil fertility and tree nutrition, and influence fruit quality characteristics.

The Benefits of Compost

Mulching fulfills the same function as using chemical herbicides, controlling weeds that compete with the trees for water and nutrients and inhibiting tree growth and fruit production. However, mulching has the added benefits of maintaining soil moisture lost from tilling and eliminating chemical run-off into the nearby Guadalupe River. Using compost-enriched mulch also improves the soil structure, mitigates soil compaction, and reestablishes the necessary microorganisms in the soil for good tree health. The volunteers from the Friends of Guadalupe River Park and Gardens anticipate long-term benefits from the on-going orchard treatment. The treatment program has only partially been implemented, but the soil is already significantly less compacted, and weed growth is much better controlled.

When the compost-amended mulch is used in place of herbicides to control weed growth the City benefits in several ways. The watershed is protected from chemical run-off, helping to implement the City's Urban Run-off policy. The City can also conserve water by reducing irrigation as the soil structure improves through systematic mulch application. Moreover, the City takes responsibility for the full lifecycle of the waste it generates by facilitating the development of marketable products and using those same products on municipal projects.



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