

Compost Use Case Study

Combating Plant Disease

The Heritage Rose Garden at Guadalupe River Park and Gardens

One of two public rose gardens in the City of San José, the spectacular Heritage Rose Garden at Guadalupe River Park and Gardens attracts visitors from around the world. In 2009 the Heritage Rose Garden achieved national recognition when the Great Rosarians of the World nominated and awarded it as the first ever inductee into the Great Rose Garden Hall of Fame. Located at Spring and Taylor Streets within easy walking distance of the Guadalupe River, the Heritage Rose Garden was established in 1995 as a living museum of over 4,000 individual plants. These represent over 3,500 varieties of heritage roses, some of them so rare as to be virtually irreplaceable. Not only does this garden have more varieties of roses than any other garden in the Western hemisphere, it is also the largest all-volunteer garden in the United States.

To Spray or Not to Spray

Over the years, the garden gradually experienced increasing problems with both weed encroachment and plant losses, culminating in massive die offs of almost 1,000 plants in a single season. An analysis conducted by a soil lab determined that the plants were suffering from fungal disease. The recommendation was to apply a strong fungicide to the roses. In keeping with its Integrated Pest Management (IPM) policy, the City recognized that, for the most part, nature maintains its own balance. Herbicides and pesticides can harm beneficial plants and animals that help maintain this balance, leading to a cycle of repeated and increasing chemical applications as weeds and pests return in higher numbers in the absence of competition from beneficials. Although City staff and volunteers were set to secure the fungicide and begin treatment of the historically hand-weeded, no-spray garden, they were interested in exploring more sustainable alternatives in order to protect the nearby Guadalupe River habitat from fungicide run-off.



Healthy Rose at the Heritage Rose Garden

Fighting Fungus with Fungus

Brian Debasitis of Mauby All Natural was called in for an independent consultation in late 2006. He not only conducted the typical chemical analysis of the garden's soil, but because the microbial environment is the driving factor in soil health, he also conducted a biological analysis. "Roses love a fungal-dominant soil," explains Mr. Debasitis. They thrive in a symbiotic relationship called a mycorrhizal association with fungi that infect their roots. Mr. Debasitis' analysis showed that the soil contained too much bacteria and not enough beneficial fungi for the roses to thrive. The mycorrhizal colonization was near zero when he started at the garden. It may seem counter-intuitive at first, but he suggested the best way to deal with a fungal problem is to increase the beneficial fungal biomass in the soil. He recommended a side-by-side test of two seriously affected rose beds to compare the outcome of a fungicide application against his solution - applying a compost tea enriched with beneficial fungi to the roots of the plants and reestablishing the microbial population with compost applications.

Compost Treatment for a Healthy Garden

The Friends of Guadalupe Park and Gardens decided to forego fungicide treatment altogether and asked Mr. Debasitis to treat the entire garden, as well as the adjacent Historic Orchard. At the garden, Mr. Debasitis first amended compost made from City green waste by Zanker Road Resource Recovery at their Z-Best composting facility, integrating pulverized oyster shell to raise calcium levels and applying wood chips from a nearby berm to introduce fungal mycelia. He then applied a layer of this specially amended compost as a top dressing to the garden in order to bring the soil chemistry and microbes back into balance and provide a healthy environment for mycorrhizal fungi to flourish. After top dressing the garden, Mr. Debasitis mulched with wood chips to help the soil retain moisture, provide a preferred food source for beneficial fungi, and improve the soil structure. After compost application and mulching, Mr. Debasitis prepared a compost tea with humic acid and inoculated with beneficial fungi and protozoa. Every six months starting in the Fall of 2006, Mr. Debasitis sprayed the entire soil and mulch surface with the compost tea, as well as conducting multiple foliar applications to plants exhibiting fungal disease on their leaves. The final step was to add mycorrhizal spores directly to a compost tea and inject the tea into the soil at the roots of each of plant to reestablish the beneficial fungi.

Compost Benefits for the Roses – and the City

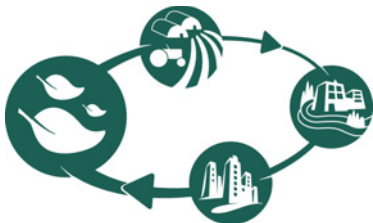
The first spring after compost treatment in the Heritage Rose Garden one long-time volunteer said she had never seen so many basal breaks – a sign of healthy rose growth – since she had started working there. After years of gradual decline which deeply affected the morale of the volunteers, the garden is now well on its way to restored good health. In 2009, the garden no longer requires compost top dressing every six months. The garden requires no fertilizer, and no amendments are added. The nutrient cycling process is working well, the fungal biomass levels have improved, and the root feeding nematodes have decreased. While the mycorrhizal fungal levels are still not well established, Mr.

Debasitis is experimenting with planting treated sunflowers to deliver the fungi to the soil in place of the labor-intensive compost tea injections. The sunflowers have the added benefit of a strong tap root which breaks up soil compaction in areas of the garden with water ponding issues.

For the City, using compost in the Rose Garden takes the place of expensive chemical herbicides, pesticides, and fertilizers which can pollute the water system. With one approach, the City can take significant steps toward implementing its Integrated Pest Management (IPM) and Urban Run-off policies. Compost can also reduce the need for irrigation, conserving water in this resource-strapped region and ultimately saving the City money. By using compost made from City green waste, the City takes responsibility for the waste generated and takes the lead in achieving its Zero Waste goals.



Sunflowers Break Up Soil at the Heritage Rose Garden



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