Bartlett Tree Research Laboratories

PLANT HEALTH CARE REPORT

Citrus

In warmer climates, citrus are planted as fruit trees, but can also be used as ornamental trees or shrubs. They have attractive, glossy, evergreen leaves; fragrant flowers; and decorative, edible fruit. In areas that do not drop below 20°F in the winter, citrus may be grown outdoors. In cooler areas, dwarf varieties may be grown in containers and moved to protected areas or indoor in the winter. Fruit quality is highly dependent on the duration of summer heat, variety selected, and overall plant health.

Meyer's lemon (*Citrus* × *meyeri*)

Courtesy of Wikimedia

Persian lime (*Citrus* × *latifolia*)

Courtesy of Wikimedia

When selecting a site to plant citrus, soil drainage must be given primary consideration. Citrus require well-drained, preferably loam, or sandy loam soil. On sites that are not well-drained, a drainage system must be installed, a raised bed developed, or the soil amended to improve drainage. If there is free-standing water on the site, the plant will not establish and be short lived. Soil pH should be between 6.0 and 7.5.

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In areas with infrequent rainfall, irrigation is required. Citrus need moist, not wet, soil. To avoid wetting the stem, drip or soaker systems are preferable to sprinklers. To reduce evaporation from the soil and provide a more favorable rooting environment, a 2 to 4" layer of mulch should be applied from near the stem to the dripline. Avoid placing mulch against the stem. A tensiometer is useful in monitoring soil moisture levels. Irrigation water needs to be low in salts and boron. If this is a concern, irrigation source water can be tested prior to use. Besides changing the source water, water filtration can aid in reducing total salts, but these filters often fail to completely eliminate boron.

For optimum growth and fruit development, citrus should be fertilized multiple times annually. Mature, standard varieties should be fertilized three times (winter, spring, late summer/early fall) over the course of the growing season using 1/3 of the annual amount of fertilizer at each application. Fertilizer should be evenly applied from near the stem to beyond the dripline.

Citrus are susceptible to micronutrient deficiencies including iron, manganese, zinc, and copper. Symptoms of micronutrient deficiency are seen in the youngest leaves as yellowing between the veins. Deficiencies can be treated with supplemental fertilization according to a soil nutrient analysis.

Numerous diseases infect citrus leaves and stems, and some are federally quarantined. Quarantined diseases include citrus greening (*Candidatus* Liberibacter asiaticus), sweet orange scab (*Elisnoe australis*), citrus canker (*Xanthomonas citri*), and black spot of citrus (*Phyllosticta citricarpa*).

Citrus greening and citrus canker have impacted the citrus industries more dramatically than any other disease or pest resulting in billions of dollars in losses. Citrus greening is caused by a bacterium that is transmitted to plants by a sucking insect called the Asian citrus psyllid (*Diaphorina citri* Kuwayama) (adults pictured at right). Both the bacterium and psyllid are from southeast Asia. Asian citrus psyllid is a federally-regulated pest that has been detected in all citrus-growing regions of the United States. Except Arizona, citrus greening has been reported in the same regions. The disease results in a general decline, and infected trees fail to produce fully ripened fruit. Early symptoms are often mistaken for nutrient deficiencies. Trees infected with this disease should be reported to your state USDA office and destroyed.

Citrus canker, another bacterial disease, results in malformed leaf, fruit, and twig lesions, and a general decline (leaf and fruit symptoms pictured at right). The lesions on leaves, fruit, and twigs will be accompanied by raised, corky growths. The bacterium is spread in wind-driven rain and thought to be introduced multiple times to the United States in hurricane winds. Trees infected with this disease should be reported to your state USDA office and destroyed. This disease has been detected in Florida, Louisiana, and Texas.

The most common diseases of backyard citrus are Phytophthora root and foot rots. Trees are predisposed to infection by excess soil water or moisture held next to the root collar. Monitoring irrigation amount and location, and keeping the root collar clear of soil, mulch, and water will help to prevent this fatal disease.

Pests that damage citrus include: citrus leafminer, spider mites, rust mites, mealybugs, scale, and aphids. Regular monitoring of the plant should identify these arthropods (insects and mites) so that they may be managed before serious damage occurs. Other plant-feeding pests cause damage to the leaves, fruit and/or twigs; early detection and mitigation will reduce explosive outbreaks.

Nematodes, microscopic worms that feed on roots, will attack citrus occasionally. Infestations and severity are usually higher in sandy soils relative to clayey soils. Symptoms include sparse growth, yellowing of foliage, and stunted growth. While these symptoms are similar to those of a nutrient deficiency, they are not remedied by fertilization. However, the addition of organic matter can reduce the severity and quantities of nematodes.

Monitoring and Treatment Considerations for Citrus

Early to mid-winter

Apply dormant treatment to suppress overwintering insects. Monitor for arthropod pests; treat as needed. Inspect soil drainage and improve as needed. Sample soil for nutrient and pH levels. Monitor irrigation and soil moisture to minimize water stress and prevent root disease.

Late winter

Fertilize and adjust pH according to analysis (1st application).

Early to mid-spring

Apply soil treatment to prevent Phytophthora root and foot rot as needed. Monitor for arthropod pests; treat as needed.

Late spring

Monitor irrigation and soil moisture to minimize water stress and prevent root disease. Fertilize and adjust pH according to analysis (2nd application).

Summer

Monitor for arthropod pests; treat as needed. Monitor irrigation and soil moisture to minimize water stress and prevent root disease.

Early fall

Monitor for arthropod pests; treat as needed. Reduce irrigation levels (from the summer) and monitor soil moisture to minimize water stress and prevent root disease. Fertilize and adjust pH according to analysis (3rd application).