

Understand how cold temps affect citrus trees

Texas A&M AgriLife Extension Service — Galveston County Office



PHOTO BY Dr. William M. Johnson



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Many gardeners have inquired about the susceptibility of citrus to cold temperatures.

The winter season has been tough on citrus plants.

It is important to understand how cold temperatures affect citrus trees.

Among the citrus types most easily killed or damaged by freezing weather are citrons, lemons and limes.

Temperatures in the high 20s will kill or severely damage these plants.

Sweet oranges and grapefruits are somewhat more cold-hardy and usually require temperatures in the mid 20s before incurring major damage to large branches.

Tangerines and mandarins are

quite cold-hardy, usually withstanding temperatures as low as the low 20s without significant wood damage.

But, among the edible types of sweet citrus, the satsuma and kumquats have the greatest degree of cold hardiness. Properly hardened bearing trees will withstand temperatures as low as 20 degrees Fahrenheit without appreciable wood damage.

Temperatures at ground level can be several degrees lower than temperatures around the canopy of the tree, especially if there is no wind.

Keep in mind the temperature ranges given above only refer to leaf or wood damage.

Citrus fruits easily freeze at 26 to 28 degrees when these temperatures occur for several

hours.

A longer duration of freezing temperatures is required to freeze grapefruit compared to sweet oranges.

And tangerines and satsumas are the most easily frozen of the common citrus fruits.

The particular temperature at which tissue of a given plant will freeze and the degree of the damage sustained are functions of a number of factors in addition to the species and variety involved.

Some of the more important are:

- The freezing temperature reached;
- The duration of the minimal temperature;

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- How well the plant became hardened or conditioned before freezing temperatures occurred (the freezing point of tissue of a hardened citrus plant might be 5 to 6 degrees lower than an unhardened plant);
- Age of plant (a young plant cannot withstand as much cold as a more mature tree); and
- Healthy trees are hardier than diseased trees.

Another complicating factor contributing to observations by some that citrus plants seem to freeze at higher temperatures in some years is the difference between air (ambient) temperatures and leaf (tissue) temperature.

On a windy night with clear or cloudy skies, leaf temperature will be about the same as air temperature.

On a cold, clear night with little or no wind movement, however, leaf temperature can easily drop several degrees (3 to 4 degrees) below the air temperature because of supercooling caused by frost.

Thus, under the latter circumstances, while the minimum air temperature on a given night may have only been 25 degrees, actual leaf temperature of the plants may have reached 21 to 22 degrees.

The critical temperature is that of the leaf or fruit and not the ambient air temperature.

Trees with a good fruit crop are less hardy than those with no fruit.

Research data provided by Louisiana State University indicated trees growing on bare ground have a higher probability of survival than trees growing in turf areas.

The heat from the ground can radiate

upward into the canopy of trees. The difference in the canopy of the tree can be up to 5 degrees.

In general, it is recommended citrus trees be protected when the temperatures is expected to go below 27 degrees for an extended period.

The good news is before the cold snap, temperatures had been on the cool side for a while and citrus trees had hardened off and were fairly dormant.

Citrus trees can better withstand cold weather when they are dormant.

No immediate action is needed when freeze injury is suspected. There is no benefit to pruning the plant until spring growth commences, and the full extent of injury is manifested.

Pruning might actually be counterproductive by stimulating faster bud activity before the danger of additional frost/freezing events has truly passed.

