

Cold Weather Damage on Citrus

Texas A&M AgriLife Extension Service — Galveston County Office



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Home gardeners grow a remarkably wide range of citrus. Winters are typically mild but freezing temperatures do occur on occasion. It is prudent for home citrus growers to protect their plants when freezing weather conditions are expected to occur.

One of my friends in College Station sent me an e-mail last Sunday at 6:59 p.m. that contained a photo of a back yard adorned with a light covering of snow and snow was still falling. Even with the low probability of receiving snowfall in our area, many folks were understandably excited about snow.

However, if you grow citrus in our subtropical growing region you would likely be concerned about how well your citrus would fare if

freezing weather conditions were to occur. It is important to understand how cold temperatures impact citrus trees.

Among the citrus types that are 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 into 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 F 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 that the temperature ranges given above refer only to leaf or wood damage. Citrus fruits easily freeze at 26 to 28 degrees F 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 the 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
- How well the plant became hardened or conditioned before freezing temperatures occurred (the freezing point of tissue of a hardened citrus plant may be 5-to-6 degrees lower than an unhardened plant)
- Age of plant (young plants are more cold-sensitive than mature plants)
- 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 than others is the difference between air (ambient) temperatures and leaf (tissue) temperature.

On a windy night with clear or cloudy skies, leaf temperature will be approximately 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 F) below the air temperature because of super-cooling caused by frost. Thus, under the latter circumstances, while the minimum air temperature on a given night may have only been 25 degrees F, actual leaf temperature of the plants may have reached 21-to-22 degrees F. The critical temperature is that of the leaf or fruit and not the ambient air temperature itself. Trees with a good fruit crop are less hardy than those with no fruit.

Research data provided by Louisiana State University indicate that trees growing on bare ground have a higher probability of survival than trees growing in turf areas. The heat from the ground can radiate upwards into the canopy of trees. The difference in the canopy of the tree can be up to 5 degrees F.

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

The good news is that temperatures have been on the cool side for a while and citrus trees have hardened off and are fairly dormant. Citrus trees can better withstand cold weather when they are dormant.

Should freezing weather conditions occur, 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 may actually be counter-productive by stimulating faster bud activity before the danger of additional frost/freeze events has truly passed.

