Avoiding Cold Damage to Home Citrus

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Citrus (& avocado) are subtropical plants. When frost or freezing temperatures are predicted, precautions must be taken in order to minimize damage to the trees and fruit.

Irrigate before the frost:

The soil beneath the tree should be bare, firm and moist. The water in the soil stores heat from the sun and slowly release it during the night. It must be moist and exposed to the sun during day. Irrigation can make a difference of 1-2 degrees. Also, a well-watered tree is more cold tolerant than a dry tree.

Cold Hardiness:

The later in winter freezing occurs the better because most plants gradually become "hardened off" after being exposed to progressively colder temperatures. Sudden cold events in late fall can be very damaging to shoots and branches that are not hardened off yet.

Satsuma mandarins on Trifoliate rootstocks are the most cold hardy mandarins, mature trees can withstand temperature down to 15 or 16º if they have had a chance to harden off. Clementines and other mandarin varieties are slightly less cold hardy, as are other rootstocks such as C-35 and Carrizo. Oranges and lemons are also less cold hardy than mandarins. General cold hardiness for mature trees: kumquat (18°) > Satsuma mandarin (20°) > Meyer lemon (22°) > oranges (Navel, blood, etc.)(24°) > grapefruit (26°).

Leaves, green wood, and fruit are more cold sensitive than hard wood. In general, hardened mandarin leaves can tolerate up to 4 hours at 20º before serious damage occurs.

Remember that the amount of time at low temperature is critical. For example, mandarin fruit will withstand a brief drop to 24º, but several hours at 26º will damage it.

Ripe fruit with higher soluble solids(sugars) is more tolerant of cold than unripe fruit because the soluble solids act as sort of an antifreeze.

Nitrogen fertilizer applied in summer or fall can encourage new growth that will be tender during the winter. Fertilize in early spring so growth can slow down & harden off in fall.

Protecting Young Trees:

If you have young trees – 1-3 years old, you should consider some type of protection if you are in a cold area. If you are covering them, a cover should:

- Entirely cover the plant (plastic that touches the plant may freeze the foliage it touches because of ice formation)
- Extend as far to the ground as possible.
- Be removed the next morning once temperatures rise so the sun can warm the soil below.

- It may be possible to cover a whole row of small trees.

You can hang source of heat in the middle of the tree such as a light bulb or Christmas lights. The lights need to be the old fashioned kind that give off heat.

Sprinklers:

For microsprinklers, you must deliver enough water to make a difference. Higher volumes are better. Microsprinklers give several degrees of protection by warming the air beneath the tree with water that is warmer than the air. You are not looking for ice formation, but a continuous application of water that is warmer than the air.

Overhead sprinklers need much higher volumes of water, so be sure you have enough water & drainage. Ice does not protect the tree--protection results from the continuous freezing of the additional water applied. As new water is applied and freezes, the ice layer gets thicker and thicker--but the temperature of the tissue under the ice layer is maintained at or just below the freezing point. If the water supply is interrupted, the temperature of the tissue beneath the ice will quickly drop, usually to levels below air temperature, and remain there until the ice melts, causing more damage. Overhead sprinklers must start before the air temperature reaches freezing and continue running until ice in the shade away from the tree begins to melt. You need a LOT of water.

Anti-transpirants:

These sprays do not give any frost protection and are a waste of money.

After the cold:

Remove frozen fruit as soon as possible and use it immediately. Otherwise put in green waste.

DO NOT prune freeze-damaged trees until the extent of the cold damage has been determined – usually at least until spring when the weather warms.

Reduce your irrigation and fertilizer in the spring if you do have freeze damage. An excess of either can cause further damage.

Older trees, even when severely damaged, often sprout new shoots from the main branches so wait till summer before deciding what to do.

The best place to store ripe citrus is on the tree, but if a hard frost is predicted, pick any ripe fruit to give away or use. Citrus does not ripen after you pick it so there is no value in picking immature fruit. Young trees with fruit on them are less cold hardy than trees without fruit, so taking as much off as possible will help protect the tree itself.

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