

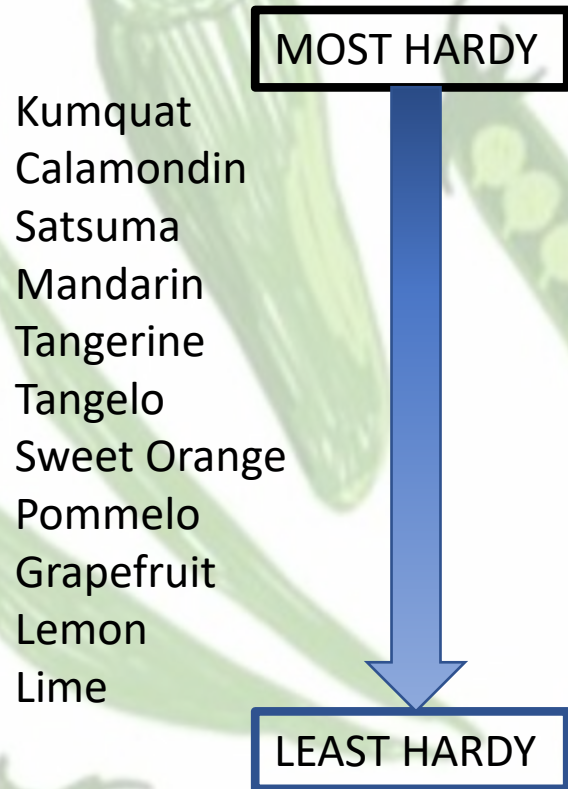
The Backyard Orchard – Citrus – Module 6.4 Freeze Protection & Damage



LSU AgCenter Backyard Orchard Certificate
Course

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Cold Hardiness Chart for Citrus Types



- Kumquats, Calamondin and Satsumas can withstand temperatures as low as 20°F
- Mandarins, Tangerines and Tangelo can withstand the low 20's
- Orange, Pommelo and Grapefruit can withstand the mid 20's
- Lemons can withstand the high 20's
- Limes only about 29°F

Citrus fruits of any type easily freeze when temperatures drop to 26-28°F for several hours.

REMEMBER

Factors responsible for freeze damage include:

- minimum temperature,
- duration of freezing temperatures,
- stage of tree acclimation.

Susceptibility of trees to freezing temperatures can also be related to:

- tree vigor,
- scion and rootstock,
- crop load,
- grove and soil conditions.

Freeze Protection Strategies - Water



- Water citrus trees. Well watered trees have increased cold hardiness.
- Do not over-water. If the ground is moist, it is not necessary to water.
- Wet soil can absorb heat during the day and radiate the heat at night.
- Wet soil can hold more heat than dry soil.

Freeze Protection Strategies - Wrap

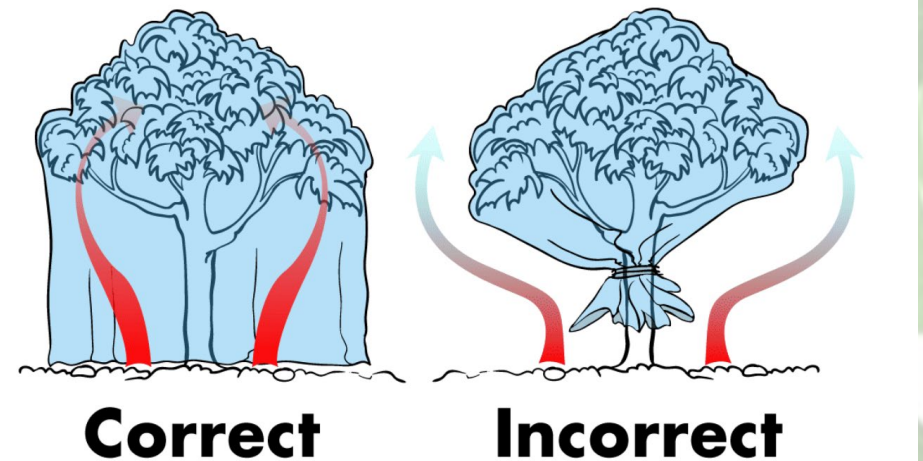


- Wrap the trunk or young trees with insulating tree wrap or mound soil around the base of the tree up to 2 feet.
- This will protect the graft of the young tree.
- If the branches freeze the graft union will be protected and new limbs can develop.

Freeze Protection Strategies -

Cover

- Cover the tree with a frost cloth, cloth sheet or blanket.
- Frames may be installed around young trees to hold the cover.
- Always remember to remove cold protection once the temperature rises so that the trees do not overheat.



Freeze Protection Strategies - Cover + Lights



- Wrap tree with strands of incandescent lights.
- For additional protection, Christmas lights can be placed around the branches of the tree and covered. This will increase the temperature under the cover by several degrees.
- Be sure to use outdoor incandescent lights and outdoor extension cords to avoid the potential of fire.
- LED lights will not work.

Freeze Damage

- Ice formation is usually accompanied by a rupture of the cell membrane and damage to the cell wall. Ice formation in leaves and the subsequent damage are diagnosed by dark water-soaked areas on the leaf surface.
- Completely frozen, killed leaves or tissues within leaves appear bleached or tan to brown in color.
- New succulent growth, when frozen, will often turn blackish in color instead of brown upon thawing.



Water-soaked areas



Brown areas in leaves



New Growth Damage

Freeze Damage



Undamaged Wood



Damaged Wood

- Leaf drop within a few days indicates that the wood is likely not damaged or killed, while leaf retention on the twigs usually indicates wood kill.
- Scratch Test - Damage can be checked by scraping the outer layer of bark. Green tissue beneath in most (but not all) cases indicates live wood, while brown tissue implies freeze-damaged dead wood.



1. With your thumbnail or knife, lightly scratch a small spot into the bark of the tree's trunk or branch.
2. Look for wet tissue beneath the bark layer that is scratched back. It should have a greenish hue – this is living tissue. Brown is dead

Freeze Damage



- Ice formation may also occur in wood, causing splits in the bark, particularly in young trees.
- Such splits may be extensive in larger trees resulting in serious injury.
- Extensive bark splits may cause the limbs to die and later break off many years after the freeze event.
- Trees should not be pruned after the freeze event until the extent of the damage is determined.



After The Freeze

- The true extent of freeze damage to branches may not be clear within the first few months following a freeze.
- No attempt should be made to prune or even assess freeze damage until the new spring flush gets fully expanded and mature.
- Therefore, no pruning should be done until late in the spring or during the summer after a freeze.
- In early spring, freeze-damaged trees often produce new growth that soon dies back. Sufficient time should be given for the dying back to cease and for the new healthy growth to take place and fully expand.
- Pruning cuts should be made into living wood and, where possible, at crotches, leaving no stubs or uneven surfaces.
- Do not fertilize until after assessment of damage. Fertilization of freeze-damaged trees should be reduced until the trees are back to their original canopy size and foliage density.



Please post all your questions and results to the message board that was emailed to you.

