



Evergreen Winter Burn provided by the Colorado State Forest Service, April 30 2020

A cold snap in October 2019, coupled with April's extreme temperature fluctuations, injured ponderosa pines, other pine species and spruce trees in the foothills areas. With warm weather preceding winter last year, the trees did not have the chance to transition into dormancy before freezing occurred. Large shifts in outside temperatures in April exacerbated the damage. Damaged evergreen trees may appear grizzled and possess white or straw-colored foliage, referred to as "winter burn." Other symptoms may include the tips of needles appearing rust-colored while the base of the needles remains green. While most sightings of pines exhibiting these frost-damage symptoms have occurred in front range county communities. Unfortunately, little can be done for trees that have sustained winter burn damage, However, don't count them out just yet, the buds on these

frost-injured trees may have survived, and they may produce new growth this spring. The CSFS recommends that residents monitor the foliage of their trees for color changes or a brittle appearance. Along with watching for these common frost injuries to their trees, residents should also frequently water their trees to avoid drought-like conditions throughout the spring, summer and fall in the absence of natural moisture from snow and rain. Trees require 10 gallons of water per inch of tree stem (measured 4.5 feet up the tree from the soil) per week during the growing season. The best time for watering is early morning or evening to avoid the hottest times of the day, when the moisture can be quickly wicked from the ground and trees.

When doing this, residents should soak the entire base of the tree slowly, to ensure deep soil penetration, and repeat this process as necessary until abundant spring rains begin to fall. Monitoring trees for cold weather damage and keeping up with watering should maximize the trees' health and vigor as they come out of dormancy in the spring and summer months.

For Solterra, the Landscape committee and Schultz Industries have been monitoring the trees since last fall (see the "Hard Freeze Oct 2019" article). In addition trees are watered during the winter with a water truck to prevent desiccation from the cold winter winds. All trees are being watered since the irrigation system was turned on in March, and all zones are being monitored and adjusted weekly. Until the buds on all the trees are fully developed, the only thing that we can do is to wait and see. The sequence of events of a severe cold snap in the fall followed by a late deep freeze in the spring is not a new event in Solterra. A similar sequence of events happened in 2014/2015.

Hard Freeze Oct 2019

Kris Howland with Schultz also asked a local arborist to provide a few words on the effect of the temperature drop in October.

The 67 degree temperature drop from October 9th (a high of 81 degrees) to October 10th (a low of 14 degrees), there was quite a shock. Then, the end of October brought us four days where the temperature never went above 30 degrees with a low in the single digits each night. A HARD FREEZE can be DEVASTATING to living tree cells. As you have probably noticed a lot of evergreen trees in the neighborhood with brown needles. The drastic temperature change that occurred in October is the reason why. Normally, the season of "FALL" gives trees a chance to acclimate to cold weather, however, our crazy October weather prevented the trees from having this acclimation period.

This acclimation period is important is important for 3 reasons:

- (1) The membranes in living tree cells become more pliable, which allows water to migrate out of the cells and into the spaces between the cells.
- (2) The tree converts starch to sugars, which act as something of an antifreeze. The cellular fluid within the living cells becomes concentrated with these natural sugars, which lowers the freezing point inside the cells.
- (3) A progressive cellular dehydration results from the first two mechanisms and allows the super-cooled contents of the tree's cells to avoid crystallizing.

All three cellular mechanisms are intended to keep living cells from freezing. A tree doesn't have to keep all of its cells from freezing, just the living ones. Not being able to acclimate and perform the three steps above means that all the new growth stimulated in your trees may not have had time to harden off sufficiently to survive sudden drops to below freezing. Ice crystals ruptured the cell walls and now this damage is showing up as dead branch tips and branches.

Unfortunately, there is nothing that we can do right now. The extent of winter damage can only be determined once new growth starts in the spring. At that time, remove only the branches that are broken or so brown that they are obviously dead. Prune all dead twigs or branches back to within one quarter of an inch above a live bud, or to the branch collar of the nearest live branch. If discoloration on narrow-leafed evergreen needles is not too severe, they may regain their green color or new foliage may be produced on the undamaged stem. Broad-leaved evergreens showing leaf damage will usually produce new leaves if branches and vegetative leaf buds have not been too severely injured. Damaged leaves may drop or be removed. If you are concerned about the evergreen's health, gently press a bud, found on the tips of the twigs and branches, between your thumb and first couple fingers. If the bud feels soft, it is alive and will produce new growth the following spring. If the bud is dry and brittle, it is dead. Check in several places around the plant as not all buds may have been killed.

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