

Book 2

Chapter 8

Frost Management - Treatment of Cold-Injured Avocado Trees

Author: R. G. Platt

Extension Subtropical Horticulturist (emeritus), University of California, Riverside

Normal grower reaction after a freeze is to immediately do something for his/her trees. This, however, is contrary to what experience has shown to be most effective in treating cold-injured avocado trees.

A full assessment of cold damage is difficult until several months following a freeze. While light damage may be apparent within a week or so, the extent of severe damage is often impossible to determine for several months.

The avocado tree has a remarkable ability to recover from cold damage. Observations following previous freezes have shown that wood, which appeared discolored and severely damaged, put out vigorous new growth later in the season. It is best, therefore, to wait and let the tree indicate the extent of damage.

Recommendations for the treatment of cold-injured avocado trees are as follows:

1. Protection from Sunburn

Protection of the trunk and large limbs from sunburn is advisable in warmer areas if regrowth has not occurred before hot weather arrives. It is only necessary to cover that part of the trunk and large limbs which 'see' south and southwest. A cold water white paint or a whitewash made of 50 pounds hydrated lime and 4 pounds zinc sulfate per 100 gallons may be sprayed or painted on the exposed wood.

2. Pruning and Training

Don't prune until the full extent of the injury has been determined by re-growth on the tree. This may be at least six months after the freeze. By pruning too soon good wood may be unnecessarily removed, or, in the case of severe injury, not enough wood will be removed and successive pruning will be required.

Lightly Damaged Trees

Trees on which only the leaves and small twigs are damaged require no special pruning treatment. Recovery is usually rapid.

Moderately Damaged Trees

Trees on which injury extends to and into the large scaffold branches will require some rebuilding of framework branches. But again, no pruning should be done until the full extent of the damage is known, usually in about six months after the freeze.

Regrowth from the uninjured limbs is usually vigorous and selection of some shoots and removal of others will be necessary to rebuild the framework of the tree. This should be done when the new shoots are two to three feet long. At the same time the injured wood should be cut back to good strong shoots.

Severely Damaged Trees

On trees in which the scaffold limbs as well as part or the entire trunk has been killed, a complete tree rebuilding is necessary. The only new shoots may be those coming from low on the trunk. If these originate above the bud union, one strong shoot on small trees and up to three strong shoots on large trees should be selected to form the new tree. Other shoots should be allowed to remain but suppressed by pinching out the terminals. These suppressed shoots act as temporary nurse limbs and are finally removed when the permanent shoots are well developed.

When more than one shoot is selected on larger trees, it is best to also cut the injured trunk off as close to the selected shoots as possible at that time. If left until the new selected shoots grow and enlarge it is difficult to remove the damaged wood without injury to the new shoots.

Trees that are killed back below the budunion may be handled in the same manner as above. Shoots originating below the budunion however, will require budding or grafting to the desired variety. If, on young trees particularly, the re-growth is weak, the tree should be removed and replaced with a new tree.

Some staking may be necessary in windy locations to prevent the new selected shoots from breaking out.

Treatment of Wounds

All large pruning cuts should be disinfected soon after the cuts are made to prevent wood rots. After disinfecting, allow the wound to dry and then cover with an asphalt emulsion.

Dissolving one teaspoon of potassium permanganate crystals in one pint of water makes a simple and effective disinfectant.

3. Irrigation

Irrigate cautiously after a freeze. Water removed from the soil by the tree is lost through the leaves. When the leaves are destroyed by a freeze the water use is less than normal until a new crop of leaves has been developed. Since the root rot fungus thrives in waterlogged soils, it is doubly important to avoid over irrigation while the tree is recovering.

Irrigate only when soil conditions indicate a need. Follow the readings of tensiometers or determine moisture by examination of the soil. Irrigations should be less frequent and smaller amounts of water should be applied until the trees have regained their ability to use normal amounts of water. In the case of severely damaged trees this reduced water requirement may last the entire growing season.

4. Fertilization

The application of fertilizer should be carefully considered and the amount will depend largely upon the extent of injury. It is best to withhold any fertilizers until the extent of damage is determined. Freeze-damaged trees will not respond better if heavily fertilized. In fact, more harm than good may occur.

Slightly injured trees will recover most rapidly and will usually set crops in the spring following a freeze. These trees will need normal fertilizer applications.

Severely damaged trees will usually put forth a good deal of sucker or shoot growth which, through selection, will be used to rebuild the tree. Until the tree regains its full top, an imbalance exists between the root system and top. Trees which have received regular fertilization or are growing on fertile soils should have ample nutrients to satisfy their needs. Fertilizer applied before the top has been reestablished will only force additional sucker growth which will be more difficult and costly to control.

Reduce or omit fertilization during the first season on severely damaged trees.

5. Micro-nutrients

The imbalance between the root system and top, together with the very vigorous sucker growth following a freeze, often results in micro-nutrient deficiencies. Zinc is the element most likely to be deficient. It should be applied as a spray when the symptoms appear. With the rapid growth of new shoots, two or three applications may be necessary during the first season.

Zinc sprays are:

3 pounds zinc sulfate (36% metallic zinc)

2½ pounds hydrated lime

100 gallons water

-or-

2 pounds zinc oxide

100 gallons water

-or

Pre-neutralized package zinc sprays

Iron deficient symptoms sometimes appear. These are often the result of excess soil moisture and can best be corrected by reducing irrigation.

6. Other considerations

In orchards where tree crowding has become a problem, the period of rebuilding after a freeze is a good time to consider orchard thinning. The removal of trees is not an easy task for a grower— either physically or mentally—but after a freeze it presents less problems.

Thinning the orchard will provide more room for normal development of the remaining trees and will make harvesting easier. It will also provide better air drainage through the orchard, thereby reducing the frost hazard.

No LITERATURE CITED for this Chapter