



TREE NOTES

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

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Frost Damage in Eucalyptus and Other Trees

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The freeze of December 1990 has left many evergreen trees looking brown and dead. This is particularly true for the large eucalyptus trees which are a prominent feature in California's landscape. Most of these eucalyptus trees survived a similar cold spell that occurred in December 1972. Many people have expressed concern about the effect of prolonged low temperatures on the health of their trees.

The best advice that can be given, concerning frost-damaged trees, is to be patient and wait until late spring before undertaking any drastic measures. These plants may not be dead and extensive pruning or removal may cause irreparable damage and unnecessary expense.

Symptoms of Frost Damage

The extent and type of tree damage can vary greatly based on several factors:

- » Plant species and its range of tolerance (also called hardiness) to low temperatures
- » Soil moisture content
- » Time of season when frost occurs
- » Minimum temperatures and their duration
- » Microclimate of the site where the tree is growing
- » Condition and size of the tree.

Many trees, particularly non-native species, are poorly adapted to sustained low temperatures. Consequently they are more frequently damaged by frost. For example, blue gum eucalyptus, a native of Australia, is hardy down to approximately 17-22°F. Because temperatures throughout the Bay Area dipped to as low as 10°F, it is no wonder that damage to eucalyptus trees was so widespread and severe.

The symptoms of frost damage vary by species and within species and may include:

- » Bronzed or brown leaves
- » Defoliation
- » Shriveled and curled stems and twigs
- » Splitting or peeling bark

What to do for frost damaged trees

Many trees have buds that are protected from low temperatures. Some species also have latent buds which form under the bark along branches and stems. When the terminal or lateral buds of a branch are killed, one or more latent buds can grow and produce new shoots. Because latent buds require warmer weather to become active, sprout development may not be visible until spring. If new shoots do not begin to grow by June, the tree is probably dead. Even if the tree appears dead, further investigation may be warranted particularly if the bark appears healthy. This can be done by cutting a small window or flap of bark (1 in. X 1 in.) out of the tree to expose, for inspection, the cambium tissue which lies between the bark and the wood. Healthy cambium is creamy white and moist while dead cambium is brown and dry or heavily streaked. It is important to remember that cutting away the bark wounds the tree allowing decay organisms to invade the wood. Keeping the wound as small as possible will help it close more rapidly. Do not apply tree seal, wound dressing, or pruning paint because these products are ineffective in promoting wound closure (callus formation) or in preventing decay.

What About Eucalyptus Trees

The prevalence of numerous, apparently dead eucalyptus trees along roadsides, in windbreaks, and in urban settings, has raised concerns about increased safety hazards and fire danger. Although eucalyptus trees have some inherent structural weaknesses, branches and tree tops killed by the frost are probably not an immediate hazard. Premature over-pruning before these trees produce new growth, may actually lead to more hazardous tree structure in the future. However, pruning to remove deadwood and improve shape after new growth begins to develop will result in a healthier tree which will recover from frost damage more rapidly. Certified arborists and those tree care professionals who have an understanding of proper tree care are best suited for this type of tree work.

Frost Damage Can Increase Fire Hazard

Even though many frost damaged trees will survive, there will be an abnormally high accumulation of flammable materials within the tree and on the ground below. Eucalyptus trees are of considerable concern to fire control agencies and resource managers throughout the state. You can reduce this fire hazard on your property by:

- » Pruning or removing dead branches and bark from the tree
- » Clearing accumulations of dry fuels (leaves, branches, bark etc.) from beneath trees
- » Removing dead trees promptly
- » Maintaining a defensible space (remove flammable vegetation within 30 ft of buildings)

Other Trees damaged by frost

The Forest Pest Management Staff has compiled a list of trees which sustained moderate to severe frost damage during the December 1990 freeze:

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Bottle Tree	<i>Brachychiton populneus</i>
Camphor Tree	<i>Cinnamomum camphora</i>
Podocarpus	<i>Podocarpus sp.</i>
Carob	<i>Ceratonia siliqua</i>
Blackwood Acacia	<i>Acacia melanoxylon</i>
Sydney Golden Wattle	<i>Acacia longifolia</i>
Brazilian Pepper	<i>Schinus terebinthifolius</i>
California Pepper	<i>Schinus molle</i>
Evergreen Ash	<i>Fraxinus uhdei</i>
Bottlebrush	<i>Callistemon sp.</i>
Eucalyptus	<i>Eucalyptus sp.</i>
Canary Island Pine	<i>Pinus canariensis</i>
Silk Oak	<i>Grevillea robusta</i>
Australian Tea Tree	<i>Leptospermum laevigatum</i>
Myoporum	<i>Myoporum laetum</i>
Melaleuca	<i>Melaleuca styphelioides</i>
Citrus	<i>Citrus sp.</i>
Mexican Fan Palm	<i>Washingtonia robusta</i>
Canary Island Date Palm	<i>Phoenix canariensis</i>
African Sumac	<i>Rhus lancea</i>