Arid Zone Times

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Trees and Cold Hardiness

The hot, endless dog days of Summer (September and October) are the best time to begin preparing landscape trees for the approaching winter. Now is the time to begin gradually reducing irrigations and complete fertilizer applications. **Plants are damaged by low temperatures** because the water inside the plant freezes. As water is transformed to ice it forms crystals within and between the cells and tissues in the plant. Ice crystals expand as they grow taking up more space than did the liquid water. This ice can crush, pierce and irreparably damage a variety of plant tissues.

The ability of a given plant to tolerate freezing temperatures is called cold hardiness. A variety of factors influence cold hardiness: maturity of the plant, the duration and intensity of freezing temperatures, protection provided by other plants and structures, whether the plant is actively growing or dormant and hardened off and the genetic characteristics of the plant. Many popular desert landscape trees, like hybrid mesquites, will continue to grow so long as temperatures and cultural practices encourage growth (regardless of daylight hours). Such trees are especially prone to frost injury from sudden cold fronts or rapid drops in temperatures if not hardened off.

Horticultural practices in late summer should be geared to preparing plants for cold temperatures. Young succulent tissues, with high water content are the most likely to be frost damaged. Reducing the amount of water and fertilizer applied is the most effective method for slowing plant growth and allowing new growth to mature and harden. Late season pruning that encourages flushes of new growth should also be avoided. **Trees and shrubs planted in lawns** that are over-seeded with winter grasses pose special challenges. Over-seeding requires that we apply large amounts of water and fertilizer during a season when trees should receive little of either. Native mesquites (both species) and honey mesquites are well adapted to these settings since they go dormant in response to shorter daylight hours and harden off despite cultural practices.

A survey conducted by William Kinnison in 1978 (published in Desert Plants") at Central Arizona College after a hard freeze (24-25 F) showed that the following trees were hardy: *Acacia aneura, A. berlandieri, A. craspedocarpa, A. stenophylla, Prosopis chilensis, Pithecellobium flexicaule, P. mexicana.* Warren Jones writing about the effects of the same freeze in northern Sonora Mexico (also published in Desert Plants"), reported that ***Lysiloma thornberi*** was damaged by temperatures below 25F and *Olneya tesota* were damaged at 20F. **Prevention remains the most effective method** of preventing cold injury. Appropriate initial landscape tree selection and proper horticultural practices keep the landscape vigorous and minimizes injury from cold temperatures.

What to do with Damaged Trees? Trees that are freeze damaged should not be pruned until late Spring when new growth has occurred. In spring you can more accurately detect the extent of damage and better limit pruning to damaged branches. Good pruning techniques should be used to prevent stimulating excessive or unwanted new shoot growth that may lead to additional frost damage the following winter.