Winter Care by Marty Weiser

General Information

Trees in pots are not as hardy as trees in the ground since they don't have as large a reservoir to draw from. This applies to all extremes - cold, heat, drought, and flood. Dehydration is often as big a problem as freezing to bonsai. Most temperate plants (maples, pines, junipers) require a period of cold weather for optimal health. Generally this ranges from 500 to 1500 hours below 35°F (2°C).

The move to dormancy in the fall is triggered by a combination of less daylight and lower temperature. Warmer temperatures and more daylight trigger the spring wake-up. Some bonsai growers advocate high phosphorous (P)fertilizer and low or no nitrogen(N) in late summer and fall as a method of preparing the plant for winter. Others disagree and cite horticultural studies showing no benefit of high phosphorous fertilizers except for blooming plants. I use lower nitrogen, higher phosphorous fertilizer (10-50-10 or similar) in the early fall and switch back to a more balanced (20-20-20) in the late fall so the roots can take up nitrogen to be ready for spring growth.

Soft, late season growth (promoted by a combination of high nitrogen fertilizer and pinching) is much more prone to winter die back. Therefore, don't pinch back in late summer/early fall; wait until top growth has stopped before cutting back.

Spokane and Coeur d'Alene are in USDA zone 5 (-10° to -20°F average annual low). Sunset Magazine lists them as sunset zone 2 (-2° to -34°F recorded) which is a more accurate indicator of how cold it can get.

All trees are different so the information below is a guideline. Trees that have been stressed(re-potted, strongly pruned, heavily wired) need additional protection.

Tropicals and Subtropicals

Tropicals don't like temperatures below 50°F (10°C) and will probably die if exposed to any frost. This includes most ficus, fukien tea, buttonwood, etc. Subtropicals will not tolerate hard freezes, but may tolerate light frost. These include bougainvillea, serissa, etc.

Bring these into a very well lit, reasonably warm area with some airflow, but minimal drafts. Subtropicals normally do better if the nighttime temperatures drop below 60°F (15°C).

South facing windows or greenhouses are best but they can be grown under artificial light. Remember that your eyes are much more adaptable than a plant; what seems bright indoors is often rather dim compared to outside.

Lack of humidity is a major problem inside the house. Trays of water under the tree (water not touching the pot) add a little humidity, but humidifiers in an enclosed space are far better if you can keep the air circulating to avoid fungus.

Mediterranean Climate

These types of trees will tolerate, and often do better if exposed to, light frost. Hard freezes may kill them, but some can survive temperatures as low as 15°F (-9°C), particularly if the roots are protected. These trees are the pomegranate, olive, etc.

Mediterranean trees need a period of cold weather for optimal health,500 hours below 45°F (7°C) is often cited. I store mine in a deep window well that is well sealed from the outside air. In addition, there is heater tape (normally used to keep pipes from freezing) in the mulch under the pots.

Hardy Plants
These trees range from needing some protection in the ground to being completely hardy. Most need some protection in a pot. This category includes many of the trees that are commonly used for bonsai. They require a period of cold weather for optimal health and they require root protection and protection from dehydration. Cold frames or deep mulching (on the ground with several inches of mulch over the pot and wind protection) are often the best alternatives.

Extremely Hardy Plants
These are the trees in your area that are next to impossible to kill by freezing if they are in the ground. Typically, they are two to three USDA zones hardier than what is state for your area, i.e. zone 2 plants in a zone 5 area. These trees include larches, amur maples, some junipers, alpine firs, spruces, etc.

They require long cold spells to go through winter dormancy and optimal health. Once winter dormancy needs are met, they easily come out of dormancy during warm spells.

Normally, the best care is to dig into the ground or mulch well on top of the ground and surround with a windbreak to prevent dehydration. Snow coverage can provide water, but remember to water a few times if there is little or no snow.

Cold Frames and Related Structures
The main purposes of these structures are to moderate temperature swings and to maintain moderate humidity. Cold frames are recessed into the ground and covered so that the temperature is closer to the earth's temperature below the frost line, which is generally around 57°F (14°C). For best performance, the cold frame should reach below the frost line. This is around 24" to 36" (60cm to 90 cm) in USDA zones 4 and 5.

Garages, sheds, poly tunnels, and covered benches can also be used for winter storage. They all moderate temperature swings to different extents and help maintain humidity. However, they generally do not provide as much protection as a cold frame since they do not benefit from warming by the earth. The bottom of the storage area should be lined with something that allows water to drain unless there is no way that water can enter. Flooding will kill trees as fast as freezing.

The storage area should not be covered with clear cover if it is exposed to direct sun. This can heat the structure enough to cause dormancy to break on a warm day. A translucent cover (white polyfilm or similar) works well with evergreens which need some light. Plywood will work for deciduous trees that need no light. A diluted lime-sulfur spray after dormancy begins is a good way to prevent fungus and insect infestations. Remember to water the trees in the storage area at least once a month. Shoveling in fluffy snow adds water as it melts, provides insulation, and helps keep the temperature more uniform.