Seasonal Tips

WINTER CARE FOR BONSAI

Most species of bonsai and nearly all temperate climate woody plants require the cold. During the Autumn, as daylight hours become shorter and temperatures drop, trees react by hardening up their immature growth. Deciduous species lose their leaves to reduce moisture loss and all growth stops for 4 or 5 months. (Coniferous species have thin, waxy needles that reduce transpiration to a minimum and this allows them to stay evergreen

• DORMANCY

As winter arrives, trees have completed their natural defensive system against the cold of winter; Some beginners feel that their trees may perish if subject to the harsh conditions of the winter months and bring their trees indoors to 'protect' them. This continuation of heat and light through the winter prevents dormancy in trees. The resulting continual growth throughout the year goes against the trees' internal clock which is requiring a dormant period, the clock can be tricked to an extent; the tree will continue to grow inside. This out of season dormancy usually results in very sickly trees and even death.
This is how the podiums should look in winter

• THE EFFECT OF FREEZING ON BONSAI

The root systems of our bonsai are the most susceptible part of the tree to damage from the cold. In nature, a trees roots' are buried into the ground and are rarely subjected to freezing temperatures. Whilst the surface of the ground may freeze, this will only affect the top few inches of the soil. Below this the cold is unable to penetrate deep enough to freeze and the trees' root system remains unaffected by the above ground temperature. Bonsai however, have their entire root system above ground level in an often shallow pot where the soil is easily affected by prevailing air-temperatures.
The top growth of trees in nature, is subject to the full force of winter and is able to withstand temperatures far lower than the root system ever could. Damage to top growth only occurs when the ambient temperature rises during the day whilst the water in the ground or pot is still frozen. This situation can often arise in greenhouses during the winter and also outside in areas where there are large fluctuations in temperature between day and night. As temperatures rise the leaves start to transpire but the roots are unable to take in replacement water from the frozen soil, causing the top growth to dry out, resulting in dieback. This problem can also be aggravated by wind which also results in moisture loss from leaves and shoots. When we see the soil in our bonsai pots is frozen in winter, it is easy to think likewise that the tree itself is frozen. In fact, it is the water in the soil that is frozen, not the soil and importantly not the roots of the bonsai itself. If the roots of the bonsai were to freeze, it would be fatal. During the Autumn, the tree stores a mixture of sugars, sugar alcohols and proteins that act as an antifreeze, so whilst the water in the soil may have crystallised into ice, the tree itself is still fluid. It is not until the temperature of the soil drops below -10°C that there is a threat of the root system freezing. There is a variation in frost-hardiness between different species of trees and naturally shallow-rooted trees such as Azaleas are hardy to far lower temperatures than species that are typically deep-rooted. Some species such as Trident Maples and Magnolias are more susceptible to frost damage and protection from temperatures warmer than -10°C should be given. When outside air temperatures drop below -10°C, the pot needs to be afforded some protection to stop the temperature of the soil dropping to the same level

One of the few trees that are truly hardy. Mugo pine or mountain pine

• WINTER QUARTERS FOR YOUR BONSAI

The temperature of the bonsai soil should be stopped from dropping by placing the tree and pot in a covered shelter. An unheated outhouse shed or garage provide the best protection, but well insulated cold-frames can also be adequate. Soil temperature can also be protected by mulching the pot or putting the tree back into the ground, though this is not as effective. These measures may not stop the water content of the pot from freezing, but will reduce the drop in temperature and stop it falling below the point where root damage occurs. The most reliable way to measure the effectiveness of your winter quarters is to place a thermometer alongside your trees to measure the degree of protection afforded against the outside temperature.
My experience of placing trees in an unheated garage, is that although temperatures will occasionally drop below freezing inside the garage, when outside temperatures dropped to -10°C for three days during the winter 2000, the temperature inside the garage never dropped below -4°C; well above the point where damage can occur. Placing especially vulnerable trees inside a cold frame inside the garage, reduced this drop to just below freezing.
Fleece or bags make good temporary protection

Winter protection should also include protection from strong winds and sun during periods when the soil is frozen and the roots are unable to replenish moisture that would be lost from the effects of direct sunlight and wind. The tree should not be placed anywhere that would allow the soil to warm up too much. Placing the tree in a heated room temporarily for instance could bring it out of dormancy. Trees are brought out of dormancy when exposed to temperatures above 10°C for a number of days.

PREPARING YOUR TREES FOR WINTER

Fungal spores and pests can also benefit from your trees' frost protection by overwintering in and around the tree itself and the pot. Ensure that all leaves and other debris on the surface of the pot and in the branches is cleared away. Remove all cobwebs and look out for small insects, in particular scale insects. Clean off all algae from the trunk and remove any mosses growing on the surface of the soil. Moss can be placed outside during the winter ready for re-applying in Spring. Spray the cleaned tree with diluted Armillatox to remove pests and algae before removing to winter quarters Pests that are harboured overwinter can rapidly increase in numbers during warmer periods of the winter and particularly in Spring, causing damage that can go unnoticed until trees are brought outside in Spring.

MICROCLIMATES

Although the general climate and weather condition cannot be

altered, there are micro-climates around your house and garden that can be taken advantage of when considering winter protection. It is possible to have a wide range of variation in microclimates around your back garden or yard.
Walls and hedges or overhanging plants will of course result in less light, but will also reduce the amount of rainfall and wind that a bonsai will be subjected to. The effect and risk of frost though can be increased or decreased by these factors.
Frost will always drop to the lowest point it can find in the garden where it will create a frost pocket, physical barriers to the downward flow, such as walls, will trap the movement of the cold air and can lead to frost pockets at the base of walls. On the other hand, walls at the top of slopes and particularly house walls tend to be slightly warmer places which can be less affected by frosts and icy conditions.
Careful observation of different areas of your property during adverse conditions will highlight places that are advantageous for placing your trees and/or constructing winter quarters.

WATERING DURING THE DORMANT PERIOD

; Your trees should never be allowed to dry out
and this can happen during the winter when trees are placed in protective quarters out of the rain. Water consumption is however very low during the dormant period and the soil should be kept damp but never sodden. Trees that are left out in the open can be at risk from overwatering during prolonged periods of rain and also from melting snow. Trees that are sat in over wet compost all through the winter can suffer from root-problems associated with overwatering. Always ensure your soil mix is free-draining to avoid these problems from the outset, but, if during the winter a tree is found to be standing in poor-draining or overly wet soil, try to move it to the side of an outhouse or wall against prevailing winds where it will receive less rainfall.

REQUIREMENT FOR LIGHT

Deciduous trees have no requirement of light once their leaves
have dropped. There are however many differing views on the requirement for light during the winter of evergreen species. The requirement of light in evergreen species is temperature dependant; the rate of photosynthesis drops as the temperatures approach freezing. At temperatures below freezing, photosynthesis does continue but excess light can actually start to cause damage, an effect known as ‘photoinhibition’. In conifers and other evergreens, exposure to direct sunlight during

periods of sub-zero temperatures can cause damage though this is repaired during the growing season. A balance has to be struck when overwintering evergreens, light is still required through the winter as photosynthesis still takes place but strong light or long periods of direct sunlight should be avoided during periods where temperatures are below freezing. During periods of temperatures below -10°C, evergreens can be stored in near dark with no adverse consequences.

REMOVING TREES FROM WINTER QUARTERS IN SPRING

Trees start into growth in the
Spring when temperatures rise above 10°C for a period of days. They are not prompted by increases in light levels. It is important that as trees start to grow they are placed back outside where they have access to light. However, late frosts in Spring can devastate tender new growth and on nights where frosts are forecast, temporary protection must be afforded.

TO SUMMERISE

• Allow your trees to enter dormancy and harden to the cold.
• Store your trees somewhere that will remain above at least -10°C all winter. Optimally, temperatures will remain between 0°C and 9°C, though temperatures just below freezing down to around -10°C will cause no damage.
• Keep your trees out of direct sunshine and strong winds when the soil is frozen.
• Do not allow the compost to dry out, nor allow to stay overly-wet, it should always remain evenly damp.
• Preferably, in areas where night frosts are rare and seldom drop below -5°C, it is better that trees are left outside in a position where they are protected against damage from excess rainfall and wind. To be cautious, if temperatures threaten to drop below -5°C during the forthcoming day or night, temporarily use winter quarters though temperatures down to -10°C could be tolerated.