Pine Management Theory

Part 9

By Greg Cloyd

Anytime Is Correct For Minor Pruning

Specific seasons are described as the optimal time for certain tasks. For example, hard pruning cuts of large branches are best made in late fall or winter. Other tasks should be performed as soon as they are noticed. Dennis Makishima frequently makes the point that there is the "right time" versus "anytime" to do certain bonsai work.

Maintaining a large collection, a grower may have forgotten he had noticed an aberrant shoot by the time it is "seasonally" correct to remove it. Dennis Makishima suggests it is better to do minor, less trimming crucial work when it is noticed rather than waiting until the ideal time, and forgetting to complete the chore.

Mid-summer Semi-dormancy

In late spring Japanese black pine candle removal induces a period of semi-dormancy. After the spring growth removal has lessened the energy reserves and energy capturing ability of the tree, a period of rest and recovery is needed to restore the tree to vigor and health.

Lessened physiologic demands of the tree and the grower's desire to produce finer growth are reasons to decrease fertilization and watering in the summer. Additionally, mid to late summer temperatures in excess of 85°F. induce a slowing of growth in most pines, especially the Mountain pines such as Japanese white pine and Ponderosa pine.

At temperatures above 85°F the stomata controlling transpiration close and water exchange slows dramatically. Because of this, soil drying and water uptake slow markedly. This tendency for the soil to remain wetter, combined with high mid-summer pot and soil temperatures, promotes root rot.

Watering: The Most Important Task Of Summer

Daily watering is the most fundamental and important bonsai task. It is frequently done by habit instead of on the basis of individual plant need. Because pine bonsai require relatively dry conditions for root health and to maintain attractively short needles, appropriate watering is vital.

Feel the foliage for warmth as an indicator of the need to water. Healthy foliage that is adequately hydrated will be transpiring and feel cool to the touch even on the hottest sunniest days. Look at the overall foliage appearance, sheen, color, droop of the needles and consider the timing of the last insult (for example, repotting) as well as species drought tolerance in considering when to water. How long it will be until you are next able to check the plant should influence your watering decisions. All this is taken into account along with heat, sun exposure, wind, humidity and time of year.

Soil water content is judged by touching the soil, and examining the color of the soil. Dry soils are paler in color. Feeling the wetness of a wick or of a potting stick driven into the soil is an additional way to use your sense of touch. Finally moist soils and moist fertilizers have stronger scents than dry soils and dry fertilizers. You were given multiple senses. It is not cheating to use them all in the daily care and appreciation of your bonsai. Quick water drainage from the soil surface followed by rapid drying of the soil indicates a healthy, active and vigorous plant.

When the plant will next be exhibited should also be taken into consideration so needle size can be reduced and discolored or burnt needle tips avoided. Unlike deciduous trees whose leaf tips may be burned by dehydration, pine needle tips are most frequently burned by overwatering. Other causes of needle tip browning include high sodium concentrations, high chloride concentrations, salt build-up in the soil, strong chemical fertilization, poor water quality and air pollutants, especially ozone.

Remember, after decandling or candle breaking the plant becomes semi-dormant temporarily and less water is required. Likewise in winter at temperatures below 45°F. and in summer at temperatures above 85°F. the plant's metabolism will slow and less frequent watering is required.

Arid Site Collected Pines

All species of pines tolerate drier conditions than deciduous trees. Japanese white pines, tolerate more drought than Japanese black pines. Even more adapted to drought, Ponderosa pines and Pitch pines are dry site trees that prefer very infrequent watering. Using my own very rapidly draining bonsai soil in deep pots, I usually water my Ponderosa pines and Pitch pines about once a week. If they remain in field soil they are watered much less frequently. Good soil drainage and root zone aeration are crucial to success with arid site and high altitude collected pines. Failure to pursue field soil removal from these plants will eventually lead to root rot and demise in areas of the United States with moderate or higher rainfall.

Autumn Techniques Of Branchlet, Needle And Bud Thinning

For the vigorous pines including, Japanese black, Scots, Pitch and Monterey, the autumn technique is a second annual chance to balance vigor and increase future ramification. Autumn vigor balancing techniques are used on all pine species grown as bonsai. They are less aggressive than spring decandling and do not vary greatly by species. These fall techniques

include branchlet thinning, casual needle thinning and terminal bud removal.

For trees grown in northern conditions, pines grown outside their ideal native range, and for less vigorous species such as Japanese white pines and Ponderosa pines fall techniques are used preferentially. Any individual tree or species that does not produce a second flush of growth in response to decandling is a good candidate for using fall techniques as the primary tools to control new growth. These techniques are the most effective and fastest tools for balancing vigor throughout the plant. Like spring techniques, autumn techniques are designed to increase the total number of buds and to make them more equal in size, number and vigor throughout the tree as well as promote adventitious budding on the interior of the tree. The goals of autumn techniques are balanced vigor and greater ramification with finer growth the following year.

Adventitious budding can occur anywhere needles are still present. On younger trees, adventitious budding may occur on wood that has not yet developed flaking bark. This budding may occur a few inches closer to the trunk than the most interior or oldest needles. On older branches adventitious buds are unlikely to occur closer to the trunk than an inch behind the last needles. Buds occasionally break out of mature barked areas of very vigorous pines, but this is a rarity. The notable exception is Pitch pine *(Pinus rigida)* which can produce buds anywhere, even on the trunks of very old trees.

Autumn Vigor Evaluation

By early October when autumn leaf color changes are becoming noticeable, branchlet thinning and medium sized branch cuts should be complete in colder climates. The timing is less critical in warmer climates where pines grow almost year round. Pursue the autumn thinning work, only if the tree is strong and improving in vigor. If your autumn evaluation shows a weakening tree, do nothing in the fall. Before removing foliage, branches, buds or roots from a pine, carefully examine the health and vigor of the plant and establish an acceptable percentage of foliage that may be safely removed. This will vary by age, species, season and specimen. There have been dozens of vigor indicators discussed. If three-fourths of the previously discussed vigor signs are present, consider a range of 30%-50% foliage removal to be safe during the combined fall and winter branch pruning and needle thinning season of Japanese black pines. The slower growing pines should have no more than 30% of their foliage removed in the fall or winter.

Autumn Branchlet Candidates For Removal

Autumn branch removal candidates are two equal sized branchlets arising from the same point on the branch. Such a branch formation will eventually produce a swelling at the junction. This is corrected by reducing one of the two to a secondary or side branch and continuing the other as the primary branch terminus. Contemporary styling sometimes uses three or more branches from a single node to produce a pleasing silhouette. This leads to knuckle-like swellings at the node. These nodal swellings are unsightly and will eventually need to be removed.

Long, bare internodes with a terminal tuft of foliage are also candidates for removal.

Congested primary branch foliage pads that have lost the defining negative space between secondary branch foliage planes should be thinned. Thin congested pads to reestablish the balance of negative and positive space. If this is unattainable, consider removing the entire branch.

Other candidates for fall removal are smaller or moderate sized branches that arise from undesirable trunk positions as taught in classical bonsai design. Long vigorous shoots and shoots extending outside the silhouette are also removed. In addition to balancing vigor, these fall techniques increase air and light penetration to the interior of the tree helping to preserve weaker interior shoots.

In the strong vigor zones, the strongest branchlets that have grown too large or soon will be too large are removed and the weakest branchlets are retained. In intermediate vigor zones the intermediate strength branchlets are retained. The strongest

Fig. 19
Prevention Of Branch Junction Swelling

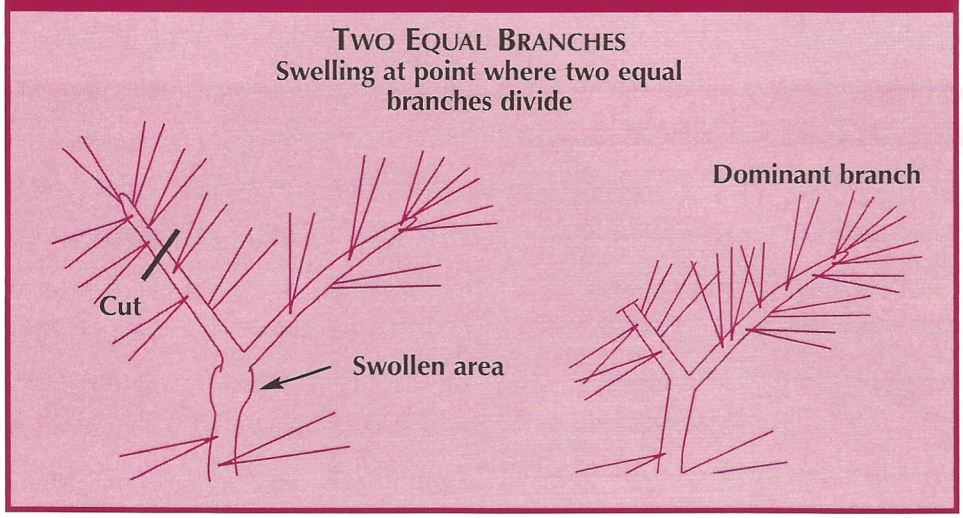


Fig. 20
Preventing Swelling

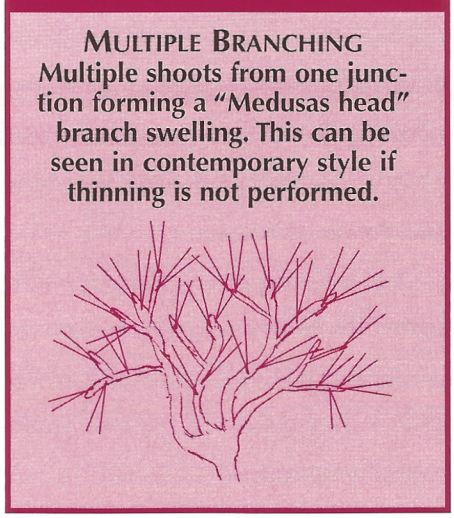
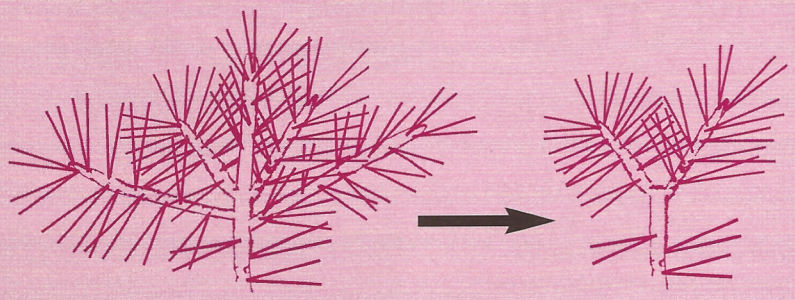
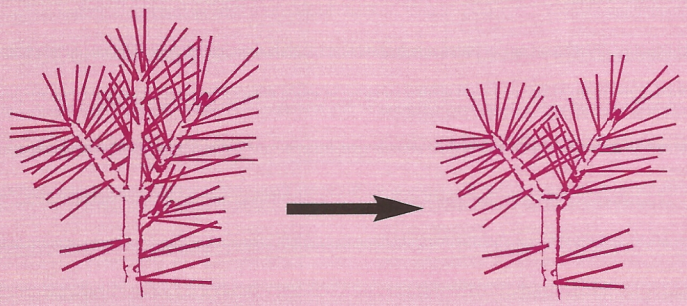


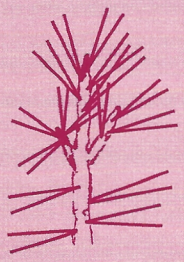
Fig. 21
Japanese Black Pine Fall Thinning



Strongest Zone
Strongest shoots removed and two weaker shoots remain with right shoot dominant and left shoot subdominate. The needles are thinned lightly "casual thinning".

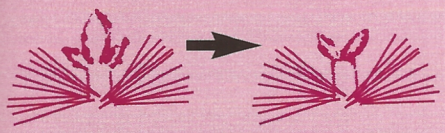


Intermediate Zone
Strongest and weakest shoots removed leaving two intermediate wide-oriented shoots. Minimal "casual thinning".

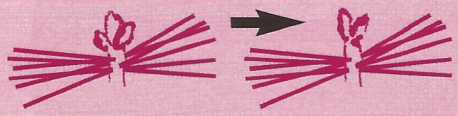


Weakest Zone
The weakest zones are left unthinned or the weakest shoots removed leaving three or more of the strongest shoots. The needles are not thinned.

Fig. 22
Fall Japanese White Pine & Ponderosa Pine Bud Removal



Strong Zone
Remove strongest buds



Intermediate Zone
Remove weakest buds

Weakest Zone **No buds removed**

branchlets are retained in the weak vigor zones of the tree.

Remember to note the branches that produced excessively strong candles in the spring. These branches will have the largest terminal buds and are excellent candidates for fall branch thinning. Removal of overly strong branchlets is a much faster and more effective way to balance vigor than sequential decandling or needle thinning.

Begin fall branchlet thinning work in late summer or early autumn as sap begins to recede and senile needles turn yellow.

Autumn Bud Removal

Another very common autumn vigor balancing technique is bud removal from branch tips with three or more buds. In strong vigor zones the most dominant bud is removed and two of the smallest and best oriented buds are retained. In intermediate vigor zones the more dominant bud is retained along with one or two other well-oriented buds. In the weak vigor zones no buds other than an occasional weak bud are removed.

Autumn bud removal is most commonly used with slower growing pines or pines that were not decandled in the spring including Japanese white pines and Ponderosa pines. A Japanese black pine decandled the previous spring will not usually produce buds of sufficient size, number and vigor, by autumn, to allow autumn bud removal.

ABOUT THE AUTHOR
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Greg Cloyd is a serious bonsai hobbyist who has studied pines for many years. He has organized an advance bonsai study group and invited many of the top pine specialists from the country for discussions and educational programs. The search for authoritative information on pine has recently led him to Japan where he visited many of the top growers.

Dr. Cloyd is a physician and member of the Cleveland Bonsai Club. He is also interested in native collected trees. He freely shares the results of his research and study by presenting programs and writing articles for publications. He maintains an impressive bonsai collection in Hudson, Ohio.