Pine Management Theory

Part 11

By Greg Cloyd

Winter Needle Thinning

Late fall and winter needle thinning is an additional technique for balancing vigor or diverting energy from the apex and branch tips to the interior and lower parts of the tree. Pines are extremely shade intolerant. Superb air circulation and full sun exposure are mandatory for good health, increased ramification and preservation of interior growth. Remember that the fine interior branches represent the future of the bonsai.

Removing older needles and thinning more recent needles allows greater air and light penetration into the interior of the tree. Air and light penetration preserves the new buds and shoots produced by the previously described techniques. Removing more needles from the most vigorous branch tips and top of the tree rather than from less vigorous branches relatively weakens those stronger areas and balances the energy production and sap flow of the tree. These winter needle thinning techniques can be more frequently and more aggressively applied to vigorous plants and are less frequently and less aggressively used with older, slower growing trees. As with any technique, it is not necessary to apply needle thinning to the entire tree, only the most vigorous areas may be thinned on some older, slower growing trees. Dennis refers to this spot thinning of vigorous apical areas, congested needles and overly long or deformed needles as "Casual Needle Thinning". Casual needle thinning is usually applied as an autumn technique in more northerly climes, but may be done throughout the year.

In contrast to autumn casual needle thinning, the more rigorous techniques are applied in winter, January and February. Descriptions of these techniques can be found in many translations of Japanese black pine literature. These translations describe leaving three to five needle pairs in strong zones, five to eight pairs in intermediate zones and eight or more pairs in weak zones of Japanese black pine. These techniques are used in preparation for showing a Japanese black pine, as well as in training very valuable and vigorous Japanese black pine developmental stock under ideal growing conditions. These rigorous thinning techniques can render a strong tree almost deciduous in appearance. This opens the interior of the tree and makes wiring much less difficult. Due to their dense foliage pads, trees trained in contemporary styles need this rigorous treatment to avoid overly large branches, branch junction swelling and interior dieback.

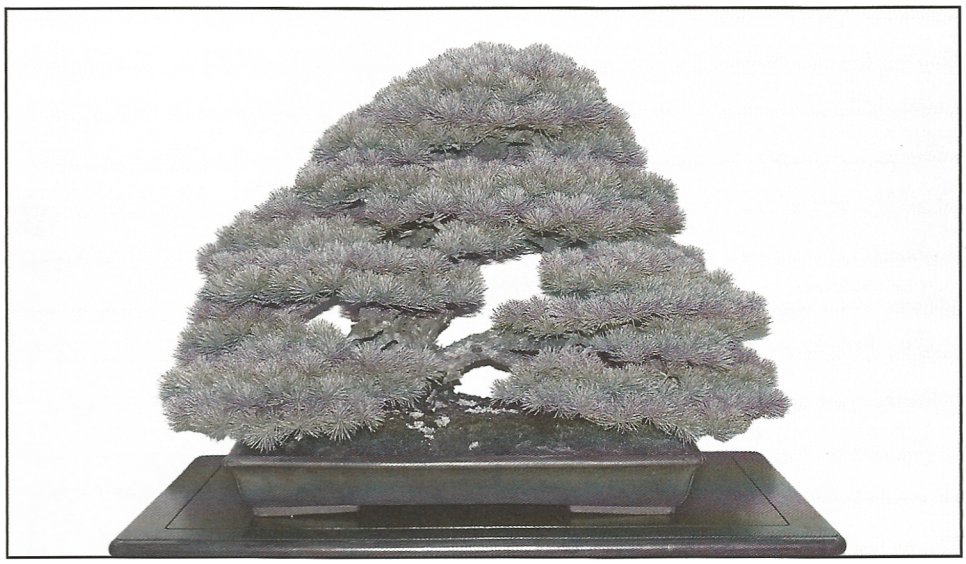
The eastern United States from Washington D.C. south to New Orleans, southern California and Hawaii are probably the only areas in the United States where Japanese black pines grow vigorously enough to apply the rigorous Japanese formulae of winter needle thinning. Dennis Makishima continually reminds pine growers that second year needles are the only energy producers left on the tree following spring candle removal. The third year needles were removed in winter and much of the tree's energy stores and future needles were removed with decandling. If a substantial number of second year needles are not left on the tree, the tree is essentially bankrupt. It has no energy reserves left and little energy capturing potential. For this reason Dennis discourages using the aggressive needle thinning techniques unless the tree is in ideal growing conditions and under professional management. The risk of tree damage or death is simply too great.

If winter wiring is not planned for a particular tree, if needle thinning was neglected the previous winter or if your trees are unavailable to you during winter storage, needle thinning may be done in spring as part of the candle management techniques. Needle thinning may also be done in summer after new needles have hardened.

Shaner's Two Stage Winter Needle Removal Technique

At the 1999 Pine Bonsai Symposium in Rochester, New York, Kathy

Japanese five-needle pine, Pinus parviflora, *displayed at the 2003 National Bonsai Exhibition in Tokyo.*



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Shaner discussed a modification of traditional Japanese black pine winter needle thinning technique adapted for Los Angeles and the southern United States. These are the areas in the United States where Japanese black pine is most vigorous, but still not as vigorous as in its native range.

She recommended reducing needle pairs somewhat in late autumn, but only by half what is recommended in the Japanese translations. She then re-evaluates the plant in the early spring and if the tree remains vigorous she completes the needle thinning, approaching reduction levels used in Japan. This technique is designed for very vigorous trees, but allows the grower to back off if the plant does not recover vigor as rapidly as expected.

Balancing Needle Density Throughout The Tree

Whether using autumn casual needle plucking or a more aggressive Japanese winter needle thinning technique, it is important to evaluate the needle density of the weakest portions of the tree and try to balance density throughout. Before attempting aggressive winter needle thinning an evaluation of vigor and inspection of the vigor distribution (zones of strength) is necessary. Pre-establishing the acceptable percentage of foliage to be removed in each zone is mandatory. The strongest vigor zones are thinned most aggressively.

Japanese Black Pine Needle Removal Candidates

Candidates for Japanese black pine casual needle plucking and winter needle removal are all third year needles, some second year needles in strong vigor zones, all deformed and diseased needles, some congested needles and all downward growing needles. In particularly strong areas of a vigorous tree, some current year needles may also be thinned. Many growers leave needle pairs on sites where they desire future buds and clear the needles around the retained pairs.

Japanese black pine needles are usually hand or tweezers plucked one at a time. This is done in an attempt to preserve the dormant bud at the base of the needle pair. Single needle plucking also reduces cambial tearing and pitch loss.

Japanese White Pine Needle Removal Candidates

Japanese white pines likewise have all third year needles and all downward growing needles removed, but much less aggressive second year needle removal. Rarely are current year needles removed from Japanese white pines.

Japanese white pine needles are cut off to prevent cambial tears and pitch loss. A one-quarter inch length of retained needle cluster is sufficient to protect the dormant bud. If the bud begins to grow the cut needle cluster above it will remain green and will stay on the tree. If the dormant bud does not activate, the cut needle cluster will turn brown and fall off a few weeks after the needle cluster is cut.

Wiring In Winter

In Japan, wiring is a task that is usually reserved for winter. This is because pines have been significantly needle thinned and the interior of the tree is visible. Sap flow is also slow at this time making the branches more flexible and less likely to ooze sap. In northern bonsai growing areas of the United States, trees are not available for wiring while they are in winter storage. Additionally it is unwise to wire a plant and then expose it to freezing temperatures without allowing a growth and recovery period of several weeks preceding the first frost. For these reasons alternate timing of wiring is often used by northern growers. This can be in early spring prior to candle emergence and late spring after decandling. It is at this time when the interior of the tree is visible and without immature new growth that can be damaged by wiring. Summer wiring is usually avoided because of heat stresses on the plant. Autumn, after casual needle thinning, is probably the favorite time for wiring in the north. Alternate timing of wiring is a good example of understanding the demands on the plant and adapting technique rather than using rote technique on set calendar dates.

Winter Saw Work

The other autumn and winter energy balancing technique is simple saw work. It is silly to try to balance energy production and sap flow in a tree by pinching candles and removing buds if an overwhelmingly vigorous apex, large branch or branch tip is the major problem. Do not try to accomplish with pinching what can only be solved with a saw. Saw work is appropriate for any pine species. Remember, major saw work, or hard cuts, should be made when the tree is less active and the sap is low.

Larger cuts on five needle pines and other sap-weeping varieties are made in fall to minimize sap loss, as sap is declining. The secondary time for large cuts on Japanese white pines is late winter or early spring before sap is rising. Large cuts are preferentially made on Japanese black pine in late winter or early spring prior to bud swelling. This is February and March in warmer climates and April and May in colder climates. This coincides with repotting season. Dennis Makishima notes that repotted Japanese white pines weep significantly less than well-established pines. He recalls growers in Japan using a knife to separate the roots from the pot wall of established Japanese white pines as a way of decreasing pitch loss after major branch removal.

Cork bark pine varieties should have stubs left on after branch removal because they do not callus well. When removing large branches from pines it is helpful to leave a stub, for a year, to slow sap withdrawal and prevent dieback. Definitely use cut paste to reduce sap loss when removing large branches.

When removing a large branch the decision must be made whether to attempt wound closure or leave a jin. This decision is guided by tree physiology, design considerations and taste.

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.