PINE MANAGEMENT THEORY

—PART 5—

By Greg Cloyd

Phenology Versus Calendar Timing Of Technique

A frequently encountered problem in learning bonsai from published literature is knowing how to adapt the growing calendar of one region to another region. In this article, phenologic signs such as the appearance of buds, candles, shoots and roots are emphasized as the basis for timing of technique over calendar dates. Phenology is the study of the relationship between climate and periodic biologic phenomena, for example geese flying south in fall correlates with autumn foliage changes.

Joe Harris relates the following phenologic guideline taught in Japan for branch pruning and wire work on pines. In fall and winter from leaf color change to cherry blossoms is the season for branch removal and wiring of pines. Calendar dates are de-emphasized.

"Reading" local plant response is instead moved to the forefront of technique timing. Late in the year, old needles have been removed, thinned or dropped off the plant. The sap flow is reduced allowing for safest branch pruning. This is the time the skeleton of the tree is most visible and wiring can best be achieved. Since this is the season when the needles appear most uniform, winter is preferred for show display of pines. The older unsightly needles have fallen or been removed.

Different growing zones and seasonal variations require modification of technique by the grower. Bonsai is fundamentally about appreciation of nature and trees in particular. There can be no better bonsai lesson than learning to closely observe trees and the passing of the seasons.

FIG. 14
PHENOLOGIC CALENDAR FOR PINE TECHNIQUES IN NORTHERN TEMPERATE ZONES

- Lengthening late winter days and rising temperatures indicate the end of winter dormancy. Buds on landscape trees begin to swell.
- Root tip initiation begins at this time, as well as, brightening of needle color. This is the ideal time for repotting. This corresponds to February and March in warmer areas of the U.S. and March or April in cooler areas.
- At the spring equinox (equal day/night length) bud swelling and root tip lengthening is noticeable and ideal repotting time is ending. Sap flow is increasing. Well-established pines that have not been repotted may be moved outside onto the ground. Less winter hardy pines (Japanese black pine) should be more carefully protected from prolonged root-zone temperatures below 28°F. The root zones of repotted pines should not be allowed to freeze.
- Initiation of fertilization begins when bud swelling is noticeable.
- In late spring, when the threat of killing frost is diminishing, the most tender trees, (including repotted pines), may be removed from winter protection. Blooming of old fashioned lilac (*Syringa vulgaris*), correlates with the passing of killing frost threat. All pines should be moved onto their growing benches by this point.
- Needle color change is complete by mid-spring.
- Cherries blossom in mid-spring. This indicates an end of wiring work and branch cutting.
- Candle elongation begins in late spring. This is the secondary spring repotting time.
- Remove fertilizer cakes after first decandling. Cut and water sparingly (semi-dormancy due to decandling).
- Pineapple phase of candles in late spring indicates time for decandling of Japanese black pine or candle breaking off Japanese white pine.
- Porcupine phase or change of candle into shoot indicates optimal decandling time has ended. This also indicates the end of the secondary spring repotting period.
- Shoot and needle hardening of non-decandled branches proceeds.
- Appearance of replacement buds is noticeable by the summer solstice (beginning of summer or longest daylight period).
- Rapid replacement shoot growth is occurring.
- Summer thinning of congestion is used on very vigorous Japanese black pine and Monterey pine (*Pinus radiata*).

FIG. 14 CONTINUED
PHENOLOGIC CALENDAR FOR PINE TECHNIQUES IN NORTHERN TEMPERATE ZONES

- Replacement shoot hardening is progressing.
- During worst of summer heat, rest plants and water carefully.
- The end of summer semi-dormancy and end of highest summer temperatures usually occur by mid-summer (early August).
- Resumption of late summer fertilization with standard organic cakes occurs as summer heat abates.
- Late summer and early autumn (September), branchlet thinning, casual needle thinning and bud selection begins. In northern areas where pines will be inaccessible during winter this is a good time for wiring. The tree has time to recover from small cracks in branches before being exposed to freezing winter temperatures.
- Secondary repotting and collecting opportunities coincide with late summer and early autumn (September). There is sufficient sunlight, warmth and growing season to allow re-establishment of a pine before severe winter weather arrives.
- In late summer and early autumn three-year-old needle yellowing is noticeable.
- End Nitrogen fertilization (organic cakes), and start bone meal fertilization in autumn when needle yellowing is noticed.
- Secondary repotting and collecting period ends around the autumn equinox (equal day/night period).
- Needles drop, deciduous leaf color change and onset of frost in north, corresponds with diminishing sap flow. Hardier plants such as pine will benefit from frost exposure outside. The trees remaining outside may benefit from resting on the ground to protect the root zones. The most tender bonsai should be in their winter quarters.
- Wiring work commences on pines that are accessible and will be well protected from wind and freezing temperatures.
- Winter protection is begun around Thanksgiving. Deciduous leaves are down. Consistent night freezing and threat of prolonged temperatures below 27°F may damage the roots of trees such as Trident maple. Japanese black pine, as well as Japanese white pine, (Japanese five-needle pine), grafted on Japanese black pine rootstock, should now be protected.
- Sap flow is dramatically reduced. Late winter heavy branch removal of White pines begins.
- The winter solstice (shortest daylight/longest night period), should see all pines in their winter quarters. Domestic mountain pines, such as Ponderosa pine may be safely stored on the ground with mulch.
- Aggressive Japanese black pine needle thinning begins on strong trees in ideal southern growing areas.
- If pines are well protected from winter wind, wiring and needle thinning may continue through the dead of winter.
- In winter, periodically check the soil of pines for moisture. Pine needles will transpire moisture on warm sunny winter days and even more so in windy conditions. If the root zone is frozen the pine will be unable to replenish its water reserves. This will result in winter needle burn or plant death if the soil moisture is not replenished. Snow cover of the root zone will alleviate this problem. Otherwise a handful of winter waterings will reduce the problem as will protection from winter wind.
- Late winter into early spring heavy branch removal of Japanese black pine completes the annual cycle.
- The days continue to lengthen and the intensity of sunlight increases as the sun rises higher in the late winter sky. The buds begin to swell and the cycle begins again.

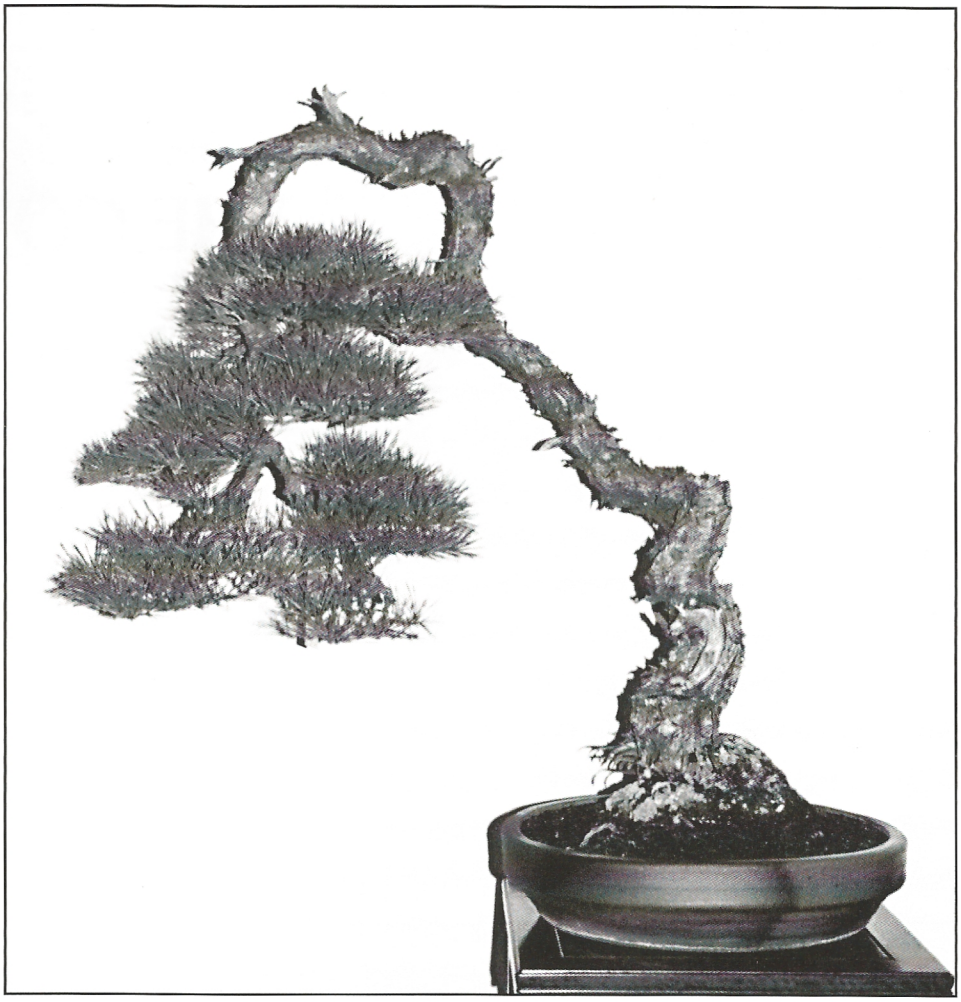
Technique

After bringing a pine into the wrong growing environment (e.g. dense overhead shade), and overwatering; the third most frequent problem a pine in bonsai culture faces is misapplication of an appropriate technique by the grower. The wrong technique is selected for the job, or the right technique is poorly timed or executed. The best protection from this is to abandon rote application of technique and to understand the theory behind the techniques.

With all pine bonsai, the goal or basic theory, is to use refinement techniques to equalize vigor throughout the plant, understanding that the apex and outer branch tips are, by nature, stronger than the interior and lower parts of the tree.

Japanese black pine management is, in essence, a series of weakening techniques used on especially strong trees to promote equalized vigor and small equalized buds and needles throughout. Scots pine, Pitch pine and Monterey pine may be thought of as similar to Japanese black pine. Japanese five-needle pine, Mugo

pine, Cork-bark Japanese black pine and Ponderosa pine also require use of techniques to equalize vigor and promote smaller equalized buds and needles, but since they are less vigorous than Japanese black pine the techniques differ in aggressiveness, timing, amount of tissue removed and length of recovery time after technique application. The theory is simple, but as with many simple things doing it well can be difficult!



Japanese red pine, Pinus densiflora, *trained in literati style from a collected specimen. This bonsai was exhibited at the 2000 Grand-view Bonsai Exhibition in Kyoto, Japan.*

ABOUT THE AUTHOR
Greg Cloyd

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.

Right– *Japanese black pine,* Pinus thunbergi, *trained in the informal upright style from an old collected tree. It was exhibited at the 2000 Grand-view Bonsai Exhibition in Kyoto, Japan. The short, dark green needles have been developed by carefully monitoring the weather and applying the appropriate bonsai techniques.*

Japanese black pine, Pinus thunbergi, *trained in the informal upright style and exhibited at the 2000 Grand-view Bonsai Exhibition in Kyoto, Japan.*

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