

PINE MANAGEMENT THEORY

PART 2



By
Greg Cloyd

Terminology

Because more has been written about Japanese black pine, *Pinus thunbergi*, bonsai than any other bonsai subject, there is much seemingly contradictory advice and confusing terminology. Different techniques are designed for different phases of development, different seasons, different goals and different climates. Many times there are multiple ways to achieve a purpose; all appropriate. Until pine theory is understood and a grower has some experience, the sheer wealth of published pine techniques can be more of a hindrance than help.

The terms bud, candle and shoot are frequently used in bonsai literature discussing pine management. These terms are varying defined or undefined by different authors. In this publication a bud refers to the dormant or resting growth tip of a branchlet. A candle is a bud which has elongated, but still has its needles pressed tightly to the structure. Harold Sasaki refers to this as the

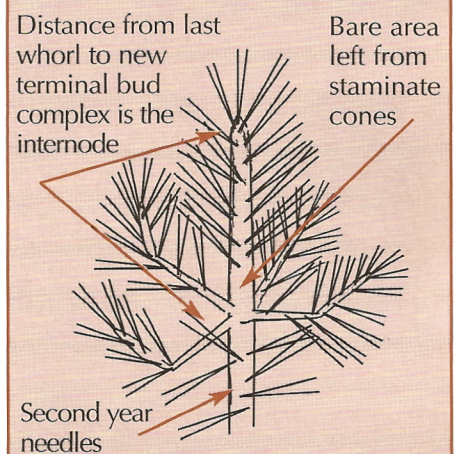
"pineapple stage" of growth. A shoot is a candle which has spread its needles outward away from the center of the new structure. Harold Sasaki describes a shoot as the "porcupine stage", I prefer Harold's terminology because it precedes my own writing and it creates a very clear mental picture of what he describes: bud, candle, shoot (pineapple vs. porcupine).

To help clarify common Japanese black pine techniques such as decandling and needle thinning, most authors divide a theoretical pine tree into upper, middle and lower zones of vigor. In these simplified examples, the upper or strongest zone has the largest and most vigorous buds which elongate first. The middle or intermediate vigor zone follows next and the lower or weakest vigor zone follows last.

Elaboration on this simplified model may lead to a more accurate understanding of the distribution of vigor throughout a pine. The dominant central bud of the terminal

FIG. 3— SUMMER PINE GROWTH TERMINOLOGY

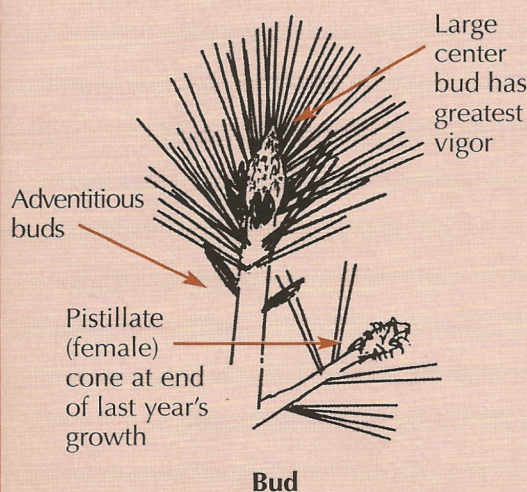
Terminal Bud Cluster Has Become A Whorl Of Branches With A Dominant Center Leader



Each branch tip will develop a new terminal bud cluster from late summer into the following spring

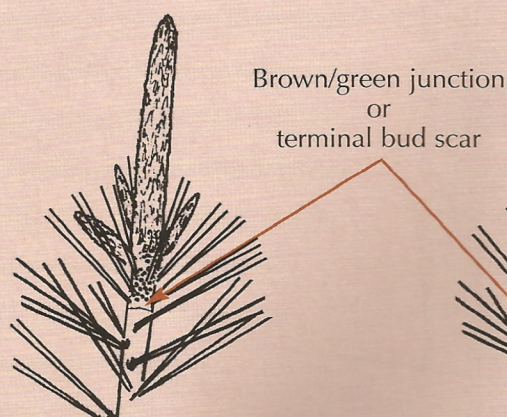
FIG. 2— SPRING PINE GROWTH TERMINOLOGY

**EARLY SPRING
Terminal Bud Complex**



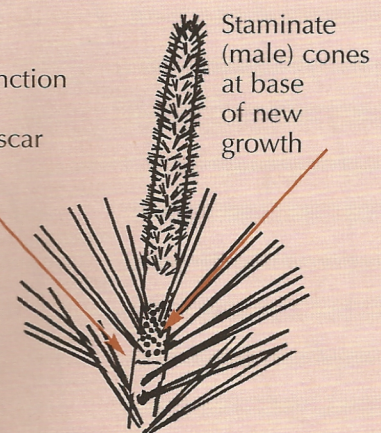
Bud

**LATE SPRING
Unbroken Candle Complex**



Pineapple Stage Or Candle

**LATE SPRING
Unbroken Candle Complex**



Porcupine Stage Or Shoot

cluster of buds of each branch will be the most vigorous bud of the branch. The terminal cluster of buds will produce the most vigorous growth on the branch. Larger branches higher on the tree will be more vigorous than similar sized branches lower on the tree, but smaller primary branches high on the tree may be less vigorous than larger primary branches lower on the tree. Likewise

interior and secondary branches located high on the tree will frequently be less vigorous than larger primary branches lower on the tree.

Vigor distribution should not be thought of as just decreasing from high on the plant to low on the plant, it should also be considered to decrease from branch tips to the interior of the tree. A low branch, for example a large, low sacrifice

branch, may be the most vigorous branch on the tree. This can only be ascertained by looking at the comparative size of the terminal buds, the number of secondary buds surrounding the dominant central bud, the overall number of buds on the branch and the overall health, length and density of needles on the branch.

Dwarf Pine Varieties

Genetically miniature and dwarf pine varieties are frequently advertised in the nursery trade for rock gardens, conifer collections and bonsai use. These are nursery selected seedlings or cutting-propagated plants selected for very slow growth or tiny proportions. They frequently are much more shrub-like (less apically dominant) than most pine species. This tendency toward naturally equalized vigor must be taken into account when managing the tree. One of the most frequently encountered dwarf pine species in bonsai culture is Dwarf mugo pine (*Pinus mugo*).

Recovery Growth After Insult

No more than one major insult should be contemplated per year per tree. An insult is anything which stresses or injures the tree. Insults frequently involve decreasing the trees' photosynthetic capacity by removing needles, or decreasing the stored energy of the tree by removing roots, branches, or buds. Severe branchlet thinning, heavy branch pruning, trunk wounding, severe needle reduction, decandling and major bud reductions are all significant insults. Generally they are not done in the same year as repotting or major wiring. The return of vigor must be carefully monitored before the next weakening technique is undertaken.

After an insult, a period of unchecked growth is frequently necessary to preserve the health of the tree. The unchecked growth period produces a return of vigor, compartmentalization of wounds, replenishment of energy stores and production of defensive chemicals. After vigor returns the grower must then strive to control the strength of the plant in order to avoid coarseness. The unending challenge of bonsai is maintaining miniaturization and vigor distribution without damaging plant health. The magazines, books and exhibit albums are full of pictures

FIG. 4—VIGOR ZONES OF PINE BRANCH

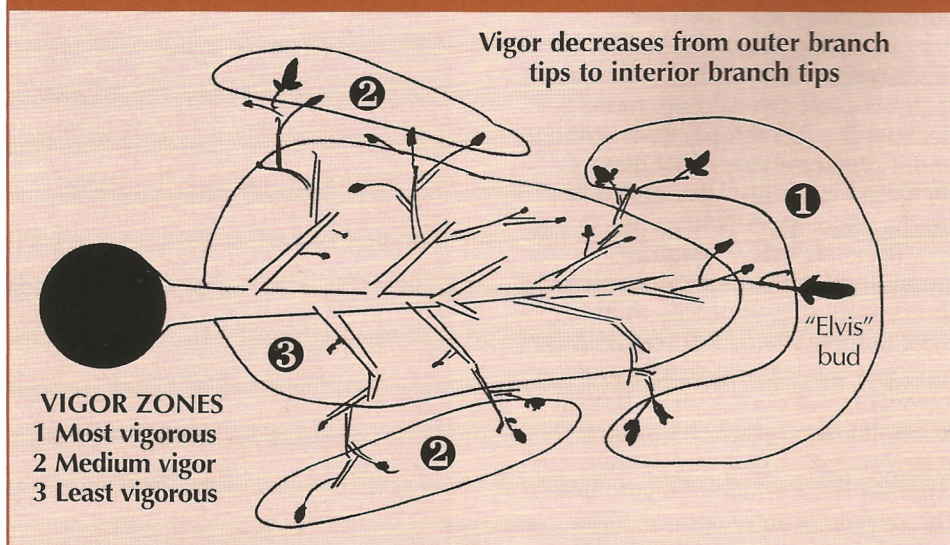
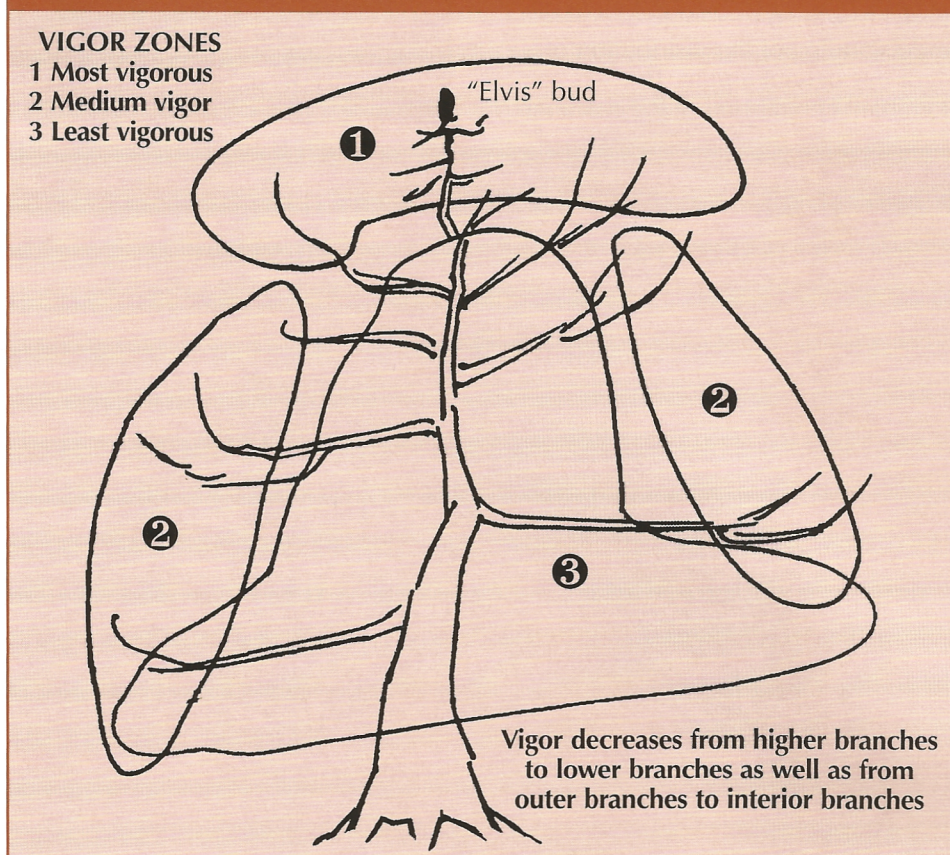


FIG. 5—VIGOR ZONES OF A PINE TREE

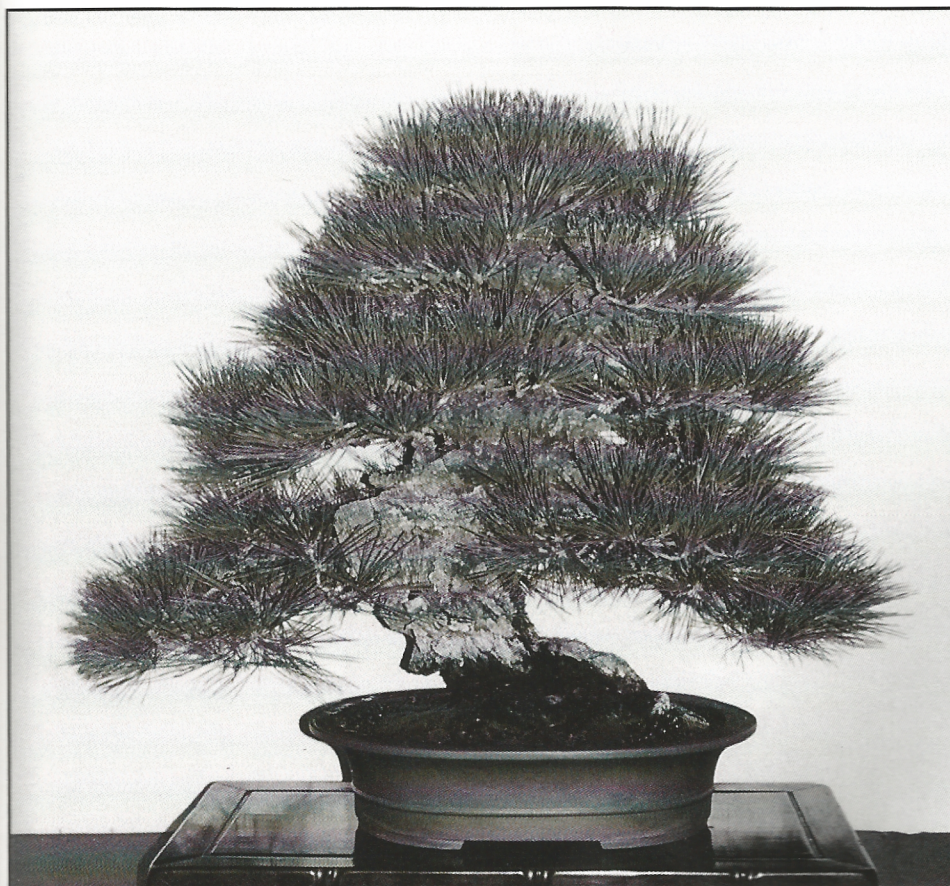




of beautiful trees that were taken to the edge of survivability for display purposes. In Japan this is usually done under an expert's professional care. The photographs live on unchanged, but the tree must then recover its strength. The refinement techniques necessary to bring about "show" level ramification and needle miniaturization cause a dramatic decrease in vigor. For many old pines it may take close to a decade for the tree to return to a state of vigor sufficient to allow the severe pruning and needle length reduction techniques necessary for entry into a show such as the Japan National Bonsai Exhibition (Nippon Bonsai Kokufu-ten).



Japanese five-needle pine, Pinus parviflora, This bonsai was trained from a collected tree and was exhibited in the 20th Annual Grand View Bonsai Exhibition in Kyoto, Japan.



Nishiki Japanese black pine, Pinus thunbergi var. corticosa. This bonsai was trained from a grafted tree and was exhibited in the 20th Annual 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.

WM N. VALAVANIS PHOTOS