TRAINING TEEN-AGED TREES

By

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Train a tree in the way it should grow,
And when it's mature it is worth more dough.

The problem before us is to grow trees from the seedling and sapling stages into well formed clear boled trees, having growth rings of fairly uniform width and wood of uniform density throughout the cross section; for many purposes, preferably above average specific gravity. We are prone to want a given result from opposing factors of growth; for example, rapid growth from trees with small branches and small crowns.

1. Natural stands offer the best opportunity of obtaining adequate initial stocking to provide for early training and development of tree form. Seeding may extend over a number of seed crops until the ground is fully stocked.

When young trees stand thick,
Side branches die quick.

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1 Presented before the Society of American Foresters' meeting, Madison, Wisconsin, December 1959.
2 Maintained at Madison, Wis., in cooperation with the University of Wisconsin.
When broad-leaved species are mixed with pines, lumber grades are improved by a more rapid killing of lateral branches of the pine.

Mixing in broad-leaved shade,
Helps improve lumber grade.

Thinning in a fully stocked stand may promote the growth of the best trees, regulate the spacing, and remove wolf trees, crooked trees, and leaning trees, all of which may contain wood of inferior quality.

Reserve the trees that are best,
Fiber products take the rest.
If ring width is restricted during the early life of the trees, management practices may keep it uniform throughout the rotation.

Trees somewhat suppressed,  
May turn out the best.

2. In Plantations. Wide spacing as frequently practiced in plantations, while promoting rapid diameter growth, also encourages wide crowns with large branches and a large knotty core. More of the yield is contained in branches.

When spacing is wide,  
Large knots grow inside.

One board foot in the stem,  
Is worth two in a limb.
Wide-ringed wood in young plantations is of lower density, and has other objectionable features, such as warping.

Wood that is not dense, 
Brings less recompense.

Where young rings are wide, 
Timbers bow to one side.

The best practice in widely spaced plantations is to begin early crown control by pruning.

High value is begun, 
By pruning when young.
3. Pruning.

Knots belong in the crown,
Not much lower down.

If satisfactory natural pruning cannot be obtained, the sooner artificial pruning is begun the better. It is cheaper to cut small branches than large ones. The essential accompaniment of pruning is thinning. To get the greatest profit from pruning growth in diameter needs to be maintained uniformly at the desired rate—for veneer 8 to 10 rings per inch.

Trees with boles round and clear,
Turn out face veneer.
Pruning may reduce diameter growth at first. This is more evident at breast height than at the base of the crown. We need to invest some time in a stand to obtain a foundation core upon which clear wood may be built later on.

After a merchantable length of clear bole has been obtained we can release the crowns and let growth proceed in accordance with the desired stand density. After this stage growth rings are unlikely to be wide enough to adversely affect wood quality. Sometimes the wood of released trees fluctuates in specific gravity along with a changing balance between crown size and soil and soil moisture content.

Pruning is recommended for production of lumber and veneer, not primarily for fiber products, however, in many cases knots are undesirable.
Recently the so called juvenile core in conifers has been given much attention. In most old growth stands it was not encountered frequently and did not present the difficulties met with recently, particularly in old field pine stands and in plantations. Competition in the old growth forest retarded diameter growth of the young trees, thus keeping springwood and summerwood more nearly in balance.

The juvenile core develops most prominently when young trees with large crowns produce wide rings having much more springwood than summerwood in the growth ring. The wide-ringed wood particularly the springwood is characterized by unusual wood structure recognized as having a large angle between the axis of the wood fiber and the slope of the fibrils in the cell wall. Measurements of fibril angles in slow thicket grown and rapid open grown trees showed a quicker change from a relatively high fibril angle next the pith to a small normal angle in the slowly grown than in the rapidly grown trees.

A recent writer, Iablokoff of France, has attributed this phenomena that he called disorganized structure to an over-abundant production of hormones in the buds--thus it is related to crown size.
A gradual change from this abnormal wood type in trees occurs at greater distances from the pith and at greater distances above the ground as the active crown moves upward and outward to the terminals of stems and branches. In other words, the matter of distance from the synthetic sources in the crown to the point of cambial activity appears also to play a role. There is a tendency particularly in springwood for growth substances originating in the crown to be used first in cambial regions close to their source. Thus, trees become more cylindrical as age increases. Sometimes discontinuous rings occur toward the base in trees with very small crowns.

A juvenile core of 6 to 8 rings per inch is unlikely to shrink excessively lengthwise. The volume loss from slow initial growth can be made up by judicious thinning later in the rotation. Likewise, thinnings will be more valuable, posts, poles, etc., even higher density pulpwood.

**Conclusion.** We still have reason to use the earliest tool of the silviculturist, namely the ax, for stand improvement. Its use has been tried successfully for many years in countries practicing stable systems of forest management.