



Figure 1.—Vertical-grained lumber with the typical spiked knot produced in this type of cutting

alternative is to cooperate with others who also want to produce lumber for their own use—often, this is an effective solution, especially if several people share the cost of buying the mill.

2. You want to do custom cutting for customers who have their own logs.
3. You want to sell the lumber commercially.

Lumber grades

Before discussing the various types of mills in more detail, we need to review general grades of softwood and hardwood lumber and relate those grades to the types of logs that you can cut with a mill. A basic familiarity with these concepts will help you understand the capabilities of the various mills.

When a tree is young, it has many branches. As it grows in height and diameter in a stand of other trees, a natural pruning process may cause the lower branches to die and (in some species) fall off. Because it's the branches of the tree that create the knots in lumber, any wood that grows over (outside) a knot left by a fallen branch will be clear wood without knots.

For a small second-growth tree, the pruning process may not have occurred. Thus, the knots in the log from that tree extend from the center to the surface of the log.

Softwood logs of this type most often produce dimension or framing lumber for housing, the most common sizes being 2 × 4's to 2 × 12's. The most desirable grades are "2 & Better" and "Standard & Better."

Softwood lumber is produced in even-foot increments, usually from a minimum of 8 feet up to 24 feet, or the practical limitation of the particular mill. Lumber thicknesses range from 1 inch to over 24 inches from big logs.

In hardwoods, boards are cut to yield the greatest amount of clear wood. Widths are random, and the widest clear boards yield the highest grades. Lumber lengths are in 1-foot increments from 4 to 16 feet. Thicknesses range from $\frac{3}{8}$ inch to 6 inches.

In cutting for grade in pine, boards are cut to yield the widest board. In many ways, requirements for cutting pine for "Common" and "Select" (high grade clear) boards are very similar to the requirements for hardwood cutting for grade.

In large-diameter trees, clear wood exists near the surface of the log. This is the highest value wood and produces clear boards. An especially attractive type of lumber that can be produced from the clear portion of the log is vertical grained or VG lumber.

When viewed from the end of the board, the growth rings in VG lumber run across the narrow thickness from face to face (figure 1). If the log was slow-growing, the growth rings will be close together, producing a very fine even grain on the wide face of the lumber as shown. Producing VG lumber requires a specific cutting method (see "Cutting patterns and yields," page 3).

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