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THE OHIO STATE UNIVERSITY EXTENSION

Extension FactSheet

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Stacking Lumber for Drying

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Introduction

Stacking is often overlooked as an important first step in the lumber drying process. Improper stacking will result in a loss of lumber grade (degrade). Poor stacking can contribute to a loss in value during the drying process that may reach $100 per 1,000 board feet. On the other hand, attention to detail as stacks are built will contribute to the production of high-quality lumber.

The basic purpose for building lumber stacks is to facilitate the drying process and speed the movement of moisture away from the board surface. The type of drying (air, kiln, or combination) and final moisture content will influence several characteristics about the stack.

Stickers are used to separate the various lumber layers in a stack or pile. Stickers are boards specially cut for this purpose. Sticker size, or dimension, is important when considering the type of drying that will be used. For example, if the lumber-manufacturing operation is small with no dry kiln, then sticker size can be larger to permit maximum airflow between lumber layers. On the other hand, if dry kilns are used, sticker size can be reduced since fans will be used to move air through the lumber piles in the kiln. A large hardwood-lumber manufacturing facility will have thousands of dollars invested in stickers used during the drying process.

Piles

Hardwood sawyers typically produce a variety of lumber sizes and grades when maximizing the yield from grade logs. Green lumber coming from the sawmill is usually sorted and stacked according to thickness, species, and grade. Large commercial sawmills use a sorting system near the green chain to separate and "dead stack" (no space between layers) lumber according to grades and sizes. These dead stacks are then moved to an area where the lumber is built into piles to begin the drying process. The small producer must also pay attention to sorting mill production according to species, size, and grade, since these factors will influence drying rate and the ultimate value of the lumber.

Again pile size is dependent on the drying system used by the mill. Kiln dimensions will influence the size of the piles or packages that can be stacked in the drying chamber. Efficient air movement through the stacks means there is little opportunity for the air to move around the package. Since hardwood lumber is produced as random widths and random lengths, a common stacking method is box piling the lumber. As illustrated in Figure 1, the outside edges of the package are even, and the ends of the package are also even to ease the stacking in kilns. The overall dimension of the pile can range from 4 to 6 feet wide by 8, 10, or 12 feet long, depending on the length of lumber. Remember, the boards on the edge of the stack will be full-length, while the interior boards can be shorter.

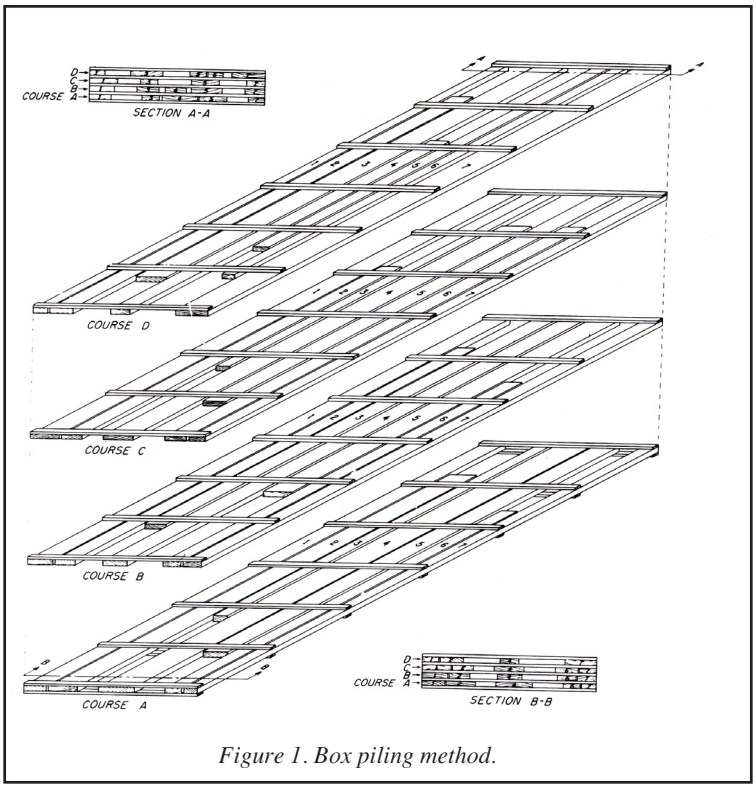

Figure 1. Box piling method.

If the lumber is transferred to an air drying yard, the foundation must be built to accommodate the weight and dimensions of the pile. The foundation must support the lumber 18 inches to 24 inches above the ground to ease the movement of cold, damp air moving downward from the lumber layers. Weeds must also be re-

moved from the base of the stack to speed the air movement. Lumber piles too close to the ground, with weeds near the base, will result in boards with higher moisture content than the upper portion of the stack. The top of the pile should have a "roof" that protects the lumber from the weather, including ultraviolet rays and repeated wetting and drying. Often the protection on top of the pile is metal roofing that is reinforced and weighted.

Stickers

Sticker length is based on pile width. Sticker thickness is usually 1/2 inch to 1 inch by 1-1/2 inches in width. The difference between thickness and width should be significant so the sticker cannot be placed on "edge," which will automatically build warp into the layer of lumber. Distance between stickers is also an important consideration. When stacking 4/4 lumber, the stickers should be placed no more than 18 inches apart. Stickers should also be placed at the very end of the layer so that the boards are supported on both ends. Supporting the ends of the boards helps control end checking and splitting. Sticker alignment, while a simple concept, is often difficult to achieve. Stickers should be aligned from top to bottom to support each layer of lumber in the stack. Stickers out of alignment can result in uneven support, and boards will develop warp as they dry. Remember, wood is at its weakest point when it is wet and warm.

Figure 2. Air drying yard, Brenneman Lumber Co.

A quality air drying yard is a matrix of horizontal and vertical lines, as seen in Figure 2. Stickers can be manufactured from a variety of species; however, they must be dry to prevent staining the green lumber. If stickers are to be used in the dry kiln, they must be manufactured from kiln dried lumber.

Defects, such as warp and end splits, that occur during drying are usually a result of poor stacking and sticking techniques. The production of quality dry lumber begins with proper stacking techniques.

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