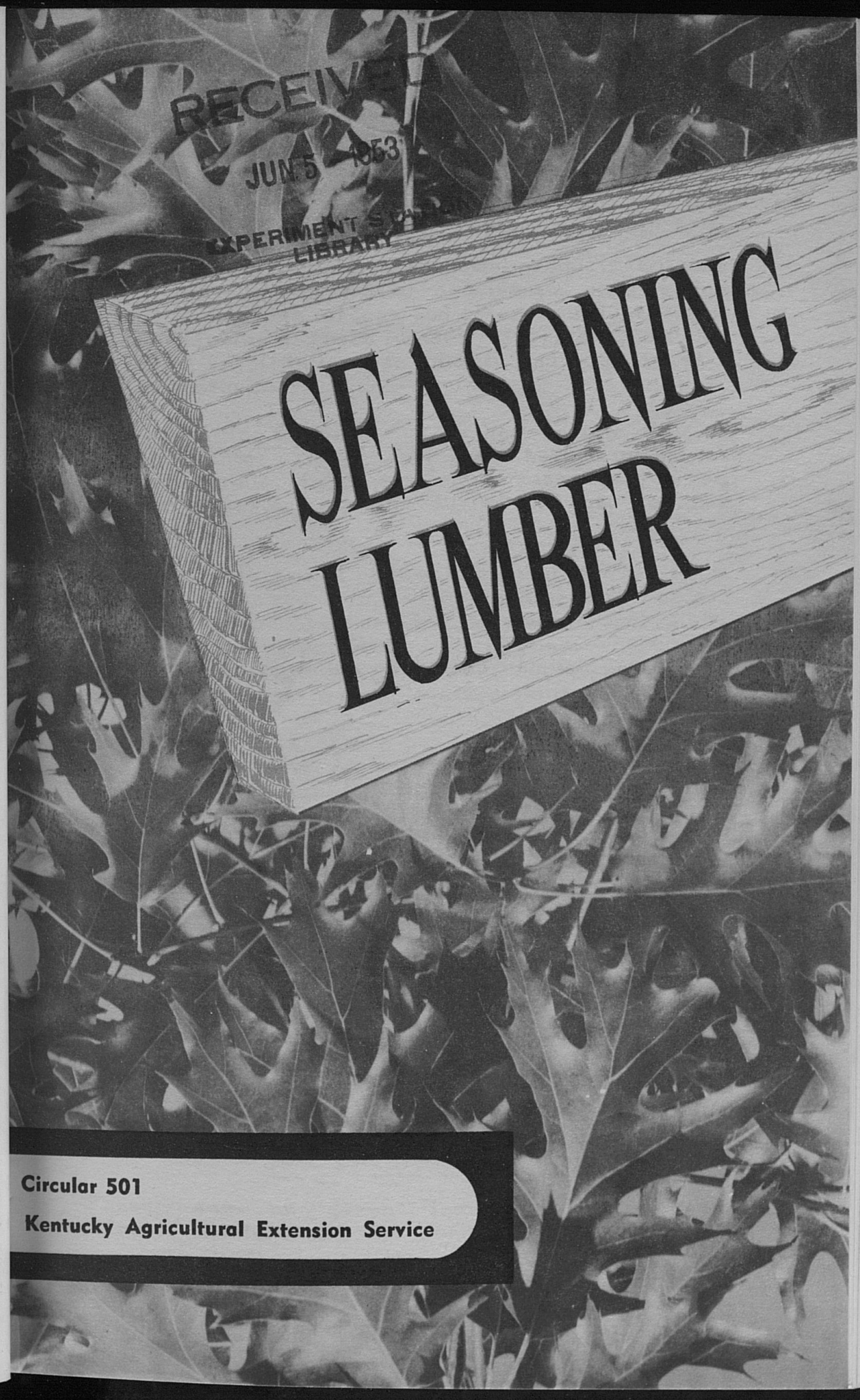


# SEASONING LUMBER

**Circular 501**

**Kentucky Agricultural Extension Service**

# LUMBER SEASONING

By. O. M. Davenport

Wise utilization of farm woodland products not only involves care in selection of species and milling, but also covers storage of logs and other round products, and the seasoning of green lumber. Carelessness at this stage may result in loss in quality and quantity of a valuable product.

Timber Cutting Season - Cut timber in late fall, or throughout winter or early spring, and have it milled as soon as possible. Logs are more susceptible to rot, stain, and insect infestations during the hot summer season.

Temporary Storage of Logs - Logs that are not taken to a mill and sawed into lumber or dimension before early summer should be skidded to central, accessible, and dry locations and rolled up in piles. The bottom tiers of logs should be kept from contact with the ground by putting them on pole-sized skids (Fig. 1).

For valuable logs it may pay to remove the bark and to spray or paint the log ends and sides several times with a 5 percent solution of pentachlorophenol to reduce damage by insects and stains. Pentachlorophenol is a wood preservative. It may be bought in 5 percent "Ready to Use" solution, or it may be bought in concentrated forms and diluted to a 5 percent solution with #2 fuel oil. Likewise if severe end-checking or splitting of logs may occur, painting of the ends with an asphalt coating will hold down this type of loss. Any asphalt roofing paint is acceptable or a thick paint of white lead and linseed oil may be used with good results.

Remember: Care of logs in storage pays off in better and more usable lumber.

## LUMBER MUST BE SEASONED

Freshly sawn or "green" lumber contains a large amount of moisture. In this condition the lumber is heavy and unfit for any but the roughest uses.

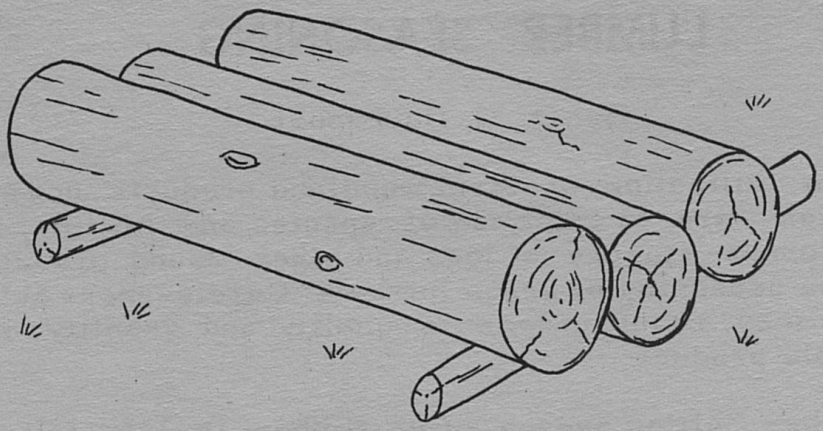

Fig. 1. - Logs in storage on skids

As the moisture in green lumber is reduced by seasoning, the lumber shrinks in width, thickness, and length. Lengthwise shrinkage is negligible and need not be considered in most cases. Shrinkage in thickness and width, however, may amount to 6 to 10 percent of the "green" dimension. Careless or improper seasoning methods invariably cause loss in quality of lumber through checking, splitting, and the various forms of warping - cupping, bowing, crook, and twisting (Fig. 2). In addition, during hot, sultry weather, improper seasoning methods favor stain in lumber. Stain reduces the grade and thus the value.

Remember: Properly seasoned lumber should be bright and flat. Properly seasoned lumber will stay in place when nailed and will retain paint much better than poorly-seasoned or unseasoned lumber.

## SEASONING LUMBER AT THE FARM

When "green" lumber is hauled from a sawmill to the farm for seasoning and storage, certain preparations should best be considered in advance. These include:

### Location of seasoning and storage area

Choose a site with both good soil drainage and good air drainage. Drying requires air movement. Don't

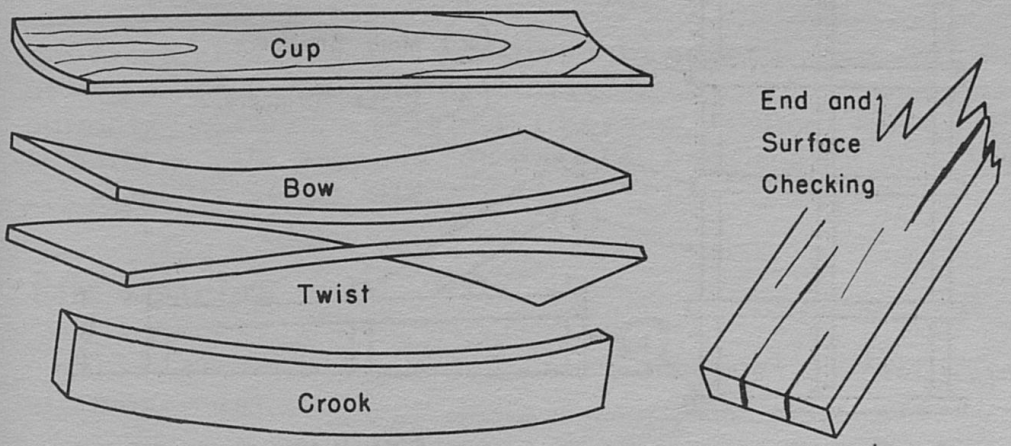


Fig. 2. - Seasoning Defects

locate piles in building corners or in wet, low spots. Put them out in the open and preferably on a gentle slope.

## Pile foundations

This structure is often neglected. Good pile foundations help to keep lumber courses in alignment and allow air drainage and movement under the pile. Posts or pier blocks of wood, stone or concrete are favored over large, solid timbers since they (posts or piers) permit air movement in all directions (Fig. 3). Slope the foundations from front to back at the rate of not less than 8 inches in 16 feet. Have enough height for the bottom course of boards to be not less than 15 inches from the ground at the rear of the pile.

Space the cross stringers in accordance with proposed sticker spacing -- that is, one for each tier of stickers -- not more than 3 foot spacing with most hardwoods. Make sure that foundation members are aligned. Misalignment in foundations results in twisted or bowed boards.

## Pile design

Width of piles should be governed by desired drying rate. Fig. 4 shows normal air drainage in a pile. Wide piles cause slow drying, with danger of stain, whereas narrow piles cause rapid drying with the likelihood of

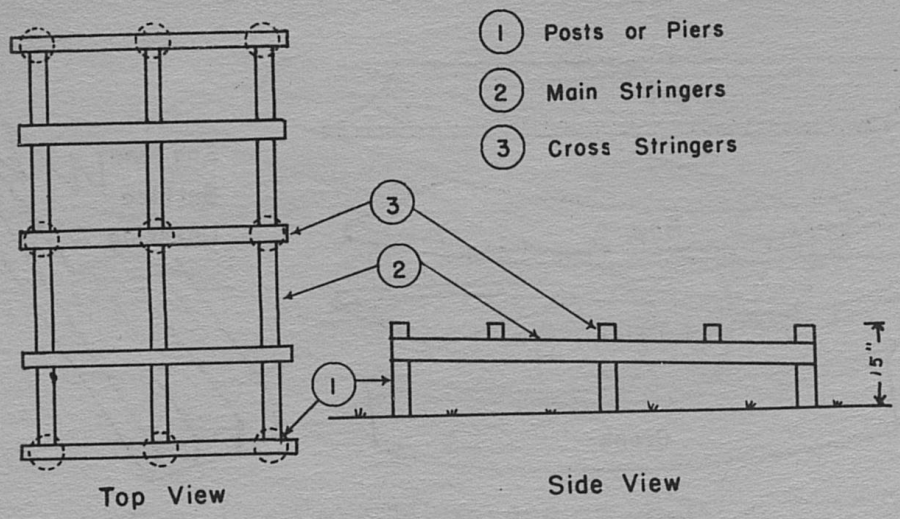


Fig. 3. - Pile Foundations

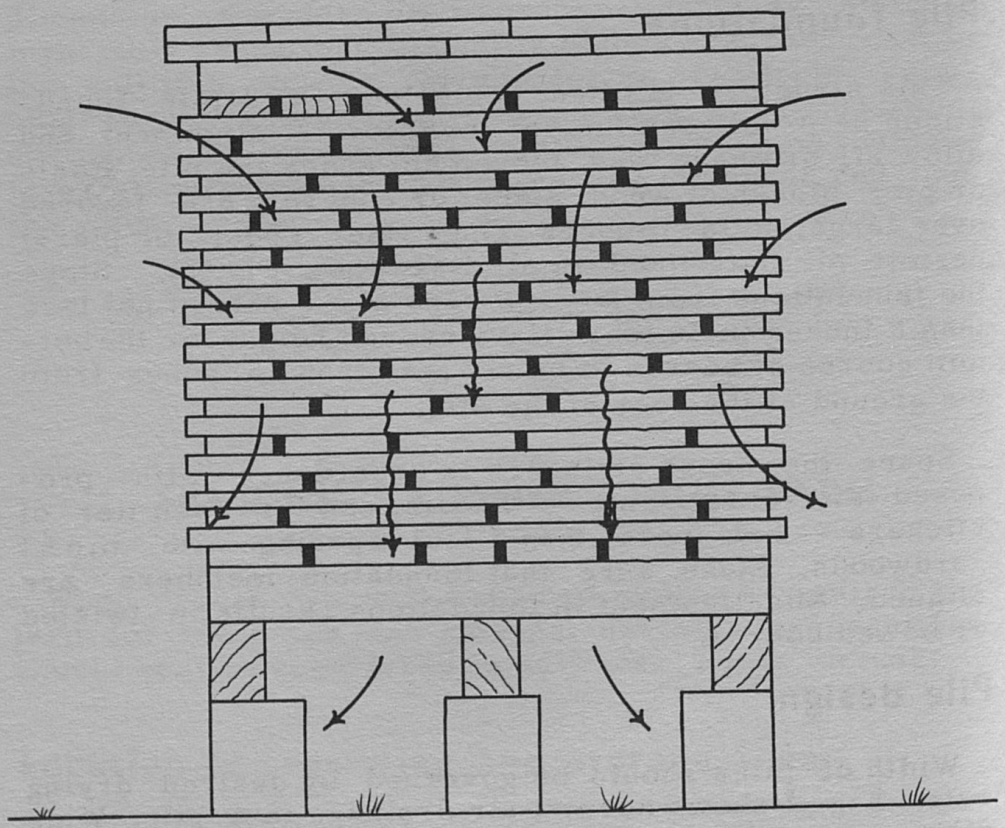

Fig. 4. - Air Drainage in Pile (Front View)

too much checking and splitting. In general, pile widths of 6 to 8 feet are satisfactory. In regions of high humidty, chimneys (Fig. 5) improve drying. How high to build a pile depends on ease of handling lumber and the stability of the pile.

## Pile spacing

Allow at least 4 to 6 feet between piles to facilitate air movement.

## Stickers

Don't rely on using narrow "green" boards for stickers. Stickers should be thoroughly air dried, all of the same thickness (usually 1 inch) are preferably not over 3 inches wide. (1 1/2 to 2 1/2 inches is enough).

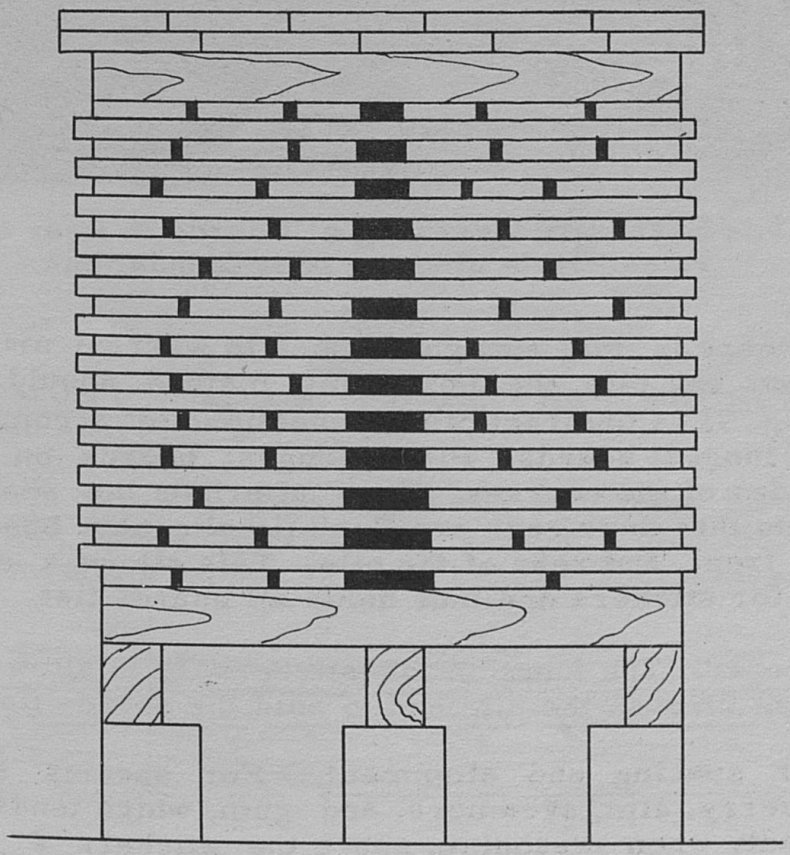

Fig. 5. - Front View of Pile, Showing Chimney

## Piling techniques

Segregation of lengths. - Whenever possible, segregate lengths within 1 foot over or under the designed pile length. Long boards in a short-length pile warp and check badly through the exposed portion - often making that section worthless (Fig. 6).

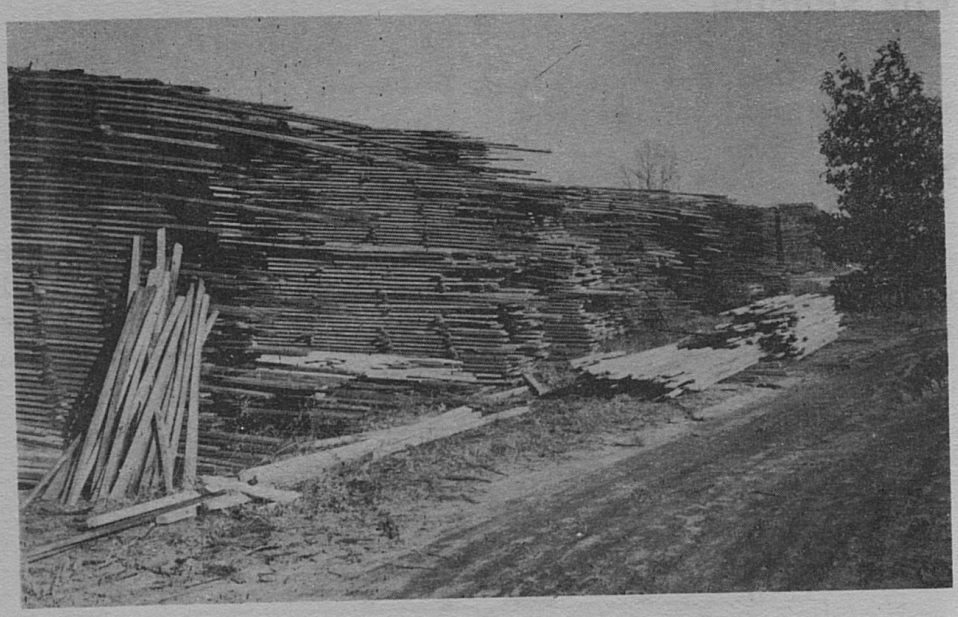

Fig. 6. - Excessive Overhang of Boards in Rear of Piles. Note also the poor foundations.

When there is not enough lumber to warrant making more than one pile, the box-piling method should be used (Fig. 7). Construct pile foundations to accommodate the longest boards. Place longest boards on the outer sides of the courses. Then alternate the shorter boards so that their ends are flush (in alternate boards) with the front and rear of the pile. This allows a solid bearing for stickers and thus holds all boards flat.

Remember: The function of stickers is to allow air movement through the pile and to hold the boards flat.

Sticker spacing and alignment. - For species such as hackberry, elm, sycamore, and gum, which tends to warp badly when seasoning, space the stickers 2 feet apart. This holds warping down to a minimum. For pine lumber, sticker spacing can safely be 4 feet.

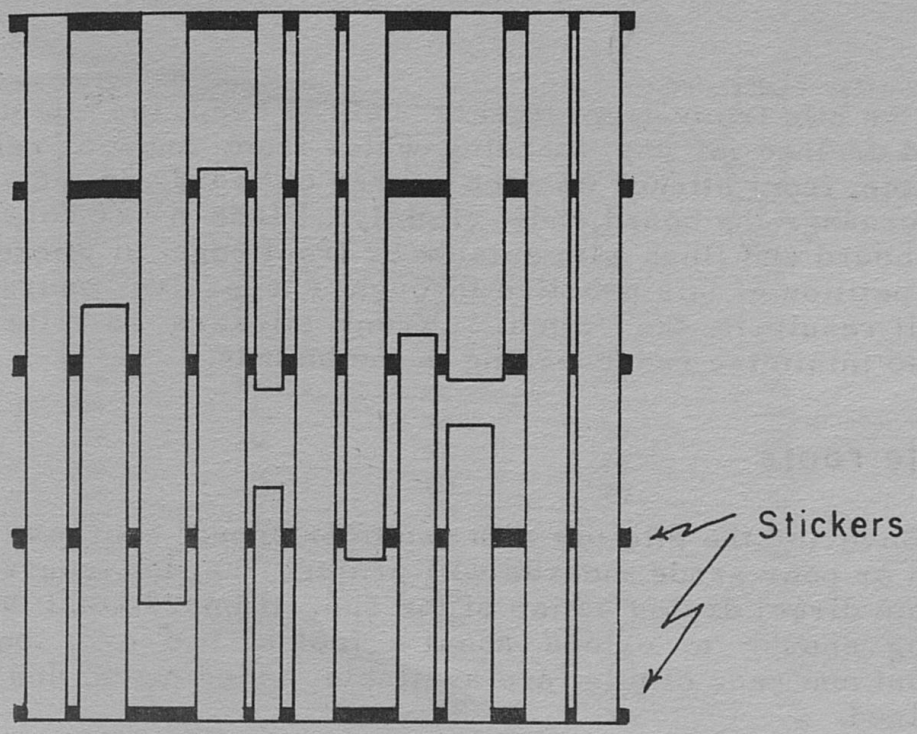


Fig. 7. - Top View of "Box-Piling" of Boards of Various Lengths

Sticker alignment is very important if the lumber is to be held flat and without lineal distortion.

Remember: The weight of the pile is transmitted downward on the stickers. Misalignment or varying thickness in stickers promotes bowing of the boards.

Spacing of boards in courses. - Keep boards at least 1 inch apart in the courses.

Pitch of pile. - This is the angle at which the front of the pile leans forward. One inch to 1 foot of vertical distance is adequate in most cases. The pitch and slope

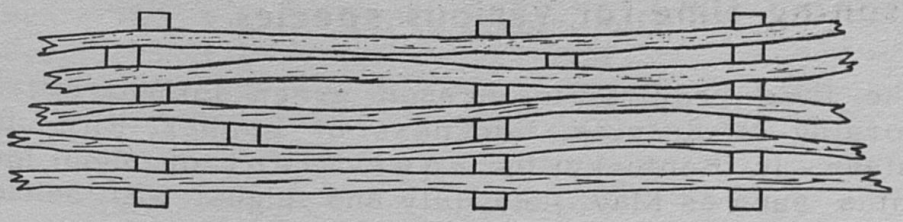

Fig. 8. - Sectional view of side of pile showing lineal distortion of boards caused by improper sticker alignment.

of the pile from front to rear help to keep the pile dry and drained of any standing water from snow or rain. Place front sticker on each course of boards so that it overhangs the board ends slightly. Place next course of board end flush with outside or front edge of sticker. Repetition of this practice through successive courses will result in the "pitch." Front stickers so placed also minimize end-checking in the boards.

## Pile roofs

Covering the pile top with two overlapped courses of old or poor grade boards will protect the top courses from direct drying action of the sun. If boards that are long enough to extend about a foot or two over both front and rear of pile are available, added protection is gained.

Block up the roof at least 4 inches to allow air movement. Anchor the roof by weighting it down with heavy timbers or wiring it to lower stickers (Fig. 9). This action also helps to prevent warping in top courses of the pile.

## Pile sanitation

Since the drying rate depends in part on movement of air, good air drainage under the pile is essential if the lower courses of boards in the pile are to be well seasoned.

Keep weeds and grass from growing up around the bottom of the pile.

## Seasoning time for various species

The time required to season green lumber differs according to species, thickness of lumber, and the weather. In Kentucky, the equivalent of about four months such as May, June, July and August will season most boards enough for construction purposes.

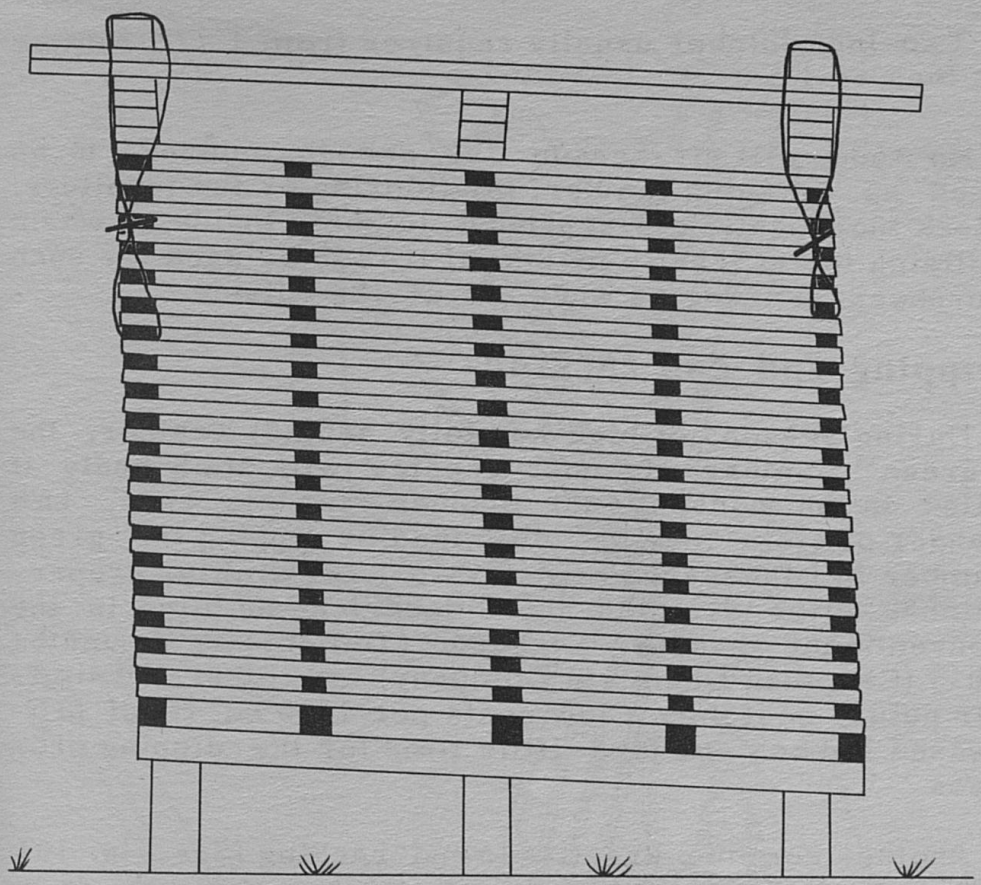

Fig. 9. - Side view of pile showing forward pitch of pile front. Note also pile roof with wire hold-downs.

The following table gives the recommended time for air-drying various species of 1-inch lumber 16-percent moisture content:

(Including Summer Months)

| | | | |
|---|---|---|---|
| Ash | 3-5 months | Hickory | 3-6 months |
| Basswood | 2-5 " | Maple, hard | 4-7 " |
| Beech | 3-6 " | Maple, soft | 3-4 " |
| Cherry | 3-6 " | Oak, red | 4-7 " |
| Cottonwood | 2-4 " | Oak, white | 6-9 " |
| Elm | 3-4 " | Poplar, yellow* | 3-4 " |
| Gum | 3-5 " | Poplar, white* | 2-3 " |
| Hackberry | 3-4 " | Walnut | 4-6 " |

*Same species. In commercial terms, yellow poplar is predominately heartwood while white poplar is mostly from smaller trees with little heartwood.

Two-inch lumber usually requires from 1 1/2-2 times as long as 1''.

No wood will air-season dry enough outdoors to be used as finishing lumber, for flooring or for furniture. Stack thoroughly air-seasoned lumber inside a warm building for at least 6 months if it is to be used for such purposes. Sticker as when air-drying outside.

## Dipping and end racking

During seasons of high humidity and hot weather, the ''green'' lumber of most species will stain badly if piled in the conventional manner. In this case, the danger of stain may be minimized by dipping the green lumber in Lignasan, Permatox 10-5 or similar preparations. After draining, the lumber can be piled in the conventional manner. Lignason (DuPont), Permatox 10-5 (Chapman Chemical Company) and others of similar nature cost only a few cents per 1000 bd. ft. of processed lumber and take little time for the dipping process.

Another common practice is end-racking (See Fig. 10). Although this method reduces staining and cuts down seasoning time required, it may induce considerable surface checking, end-splitting, and warping. These factors should be weighed very carefully in case of high-grade stock. It may be desirable to end-rack lumber until danger of stain has been avoided, and then pile in the conventional manner.

## End coating

In spite of correct piling procedure, wide, high-grade boards will sometimes end-check severely. Shading these surfaces from direct sunlight, or covering the pile end with canvas to cut down the drying rate may help. In the case of valuable stock, as mentioned previously with regard to logs, coating the ends of the boards with an asphalt paint, or a thick paint of white lead and linseed oil is effective if applied shortly after the green lumber has been stacked and before severe checking begins.

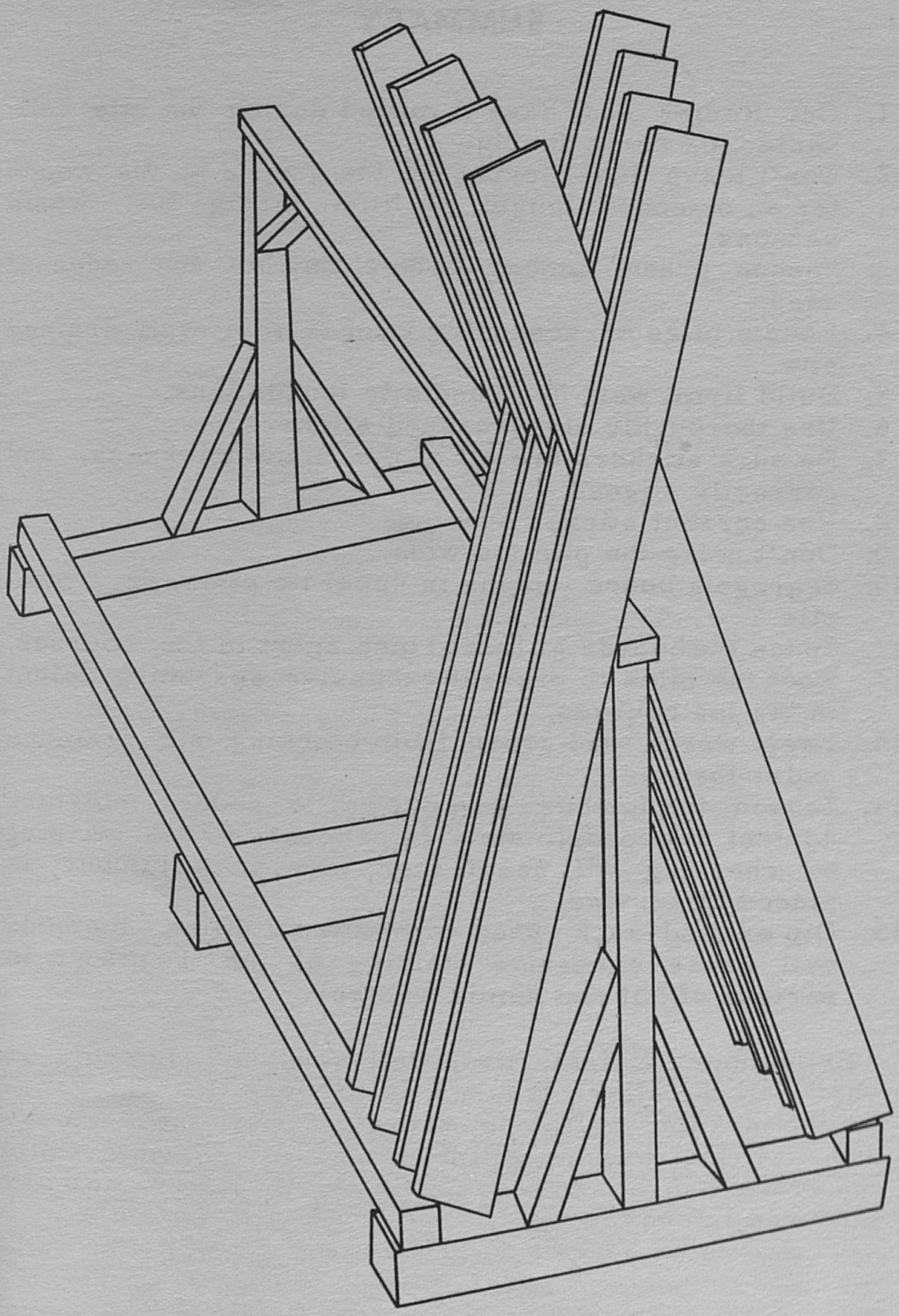

Fig. 10. - End Racking of Lumber - Showing Support Detail

## SUMMARY

1. Cut timber and have it milled during the late fall, winter, or early spring.
2. Don't leave logs laying on the ground in the woods for an extended length of time during the warm seasons.
3. Season green lumber before any but the roughest uses.
4. Locate piles of seasoning lumber on a well-drained site.
5. Build firm, well-designed pile foundations.
6. Use thoroughly air-seasoned stickers.
7. Be sure stickers are all of the same thickness, and correctly aligned.
8. Use correct sticker spacing.
9. Don't make the pile too wide.
10. Segregate board lengths in separate piles, or "box-pile."
11. Space the boards at least 1 inch apart in the courses.
12. Roof the piles to prevent excessive seasoning defect in the top courses.
13. Keep weeds and grass from blocking air drainage under the pile.
14. Season the lumber long enough to reduce moisture content to approximately 16 percent. Little warping or checking will result then when such lumber is placed in service.
15. Dip or end-rack when conventional piling methods will cause excessive staining of the lumber in periods of hot and humid weather.

Remember: Bright, flat, well-seasoned lumber is worth all the effort it takes to produce it. The satisfaction of a job well done, with tight well-made joints that stay that way, is a fine thing. All possible skills and craftsmanship are to little avail when poorly seasoned lumber is used.

Cooperative Extension Work in Agriculture and Home Economics; College of Agriculture and Home Economics, University of Kentucky, and the United States Department of Agriculture, cooperating. Frank J. Welch, Director. Issued in furtherance of the Acts of May 8 and June 30, 1914.

8M - 3 - 53