



# GOOD WOOD HOUSES ARE BUILT OF DRY LUMBER

May 1946



No. R1613

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
FOREST PRODUCTS LABORATORY  
Madison, Wisconsin

In Cooperation with the University of Wisconsin

GOOD WOOD HOUSES ARE BUILT OF DRY LUMBER

By L. V. TEESDALE, Engineer  
Forest Products Laboratory,<sup>1</sup> Forest Service  
U. S. Department of Agriculture

-----

We need homes in this country, millions of them, not only for our GI's, but for untold numbers of families whose present housing accommodations are inadequate. The buyers of these houses expect them to be permanent homes, well constructed and comparable to the type built in prewar days. They will not be equal, however, unless the materials used are equal to those used in the past. One important difference is the lack of stocks of seasoned lumber and the fact that green or unseasoned material may be used.

The tremendous demand for housing will require an enormous amount of lumber. Because present lumber stocks are practically exhausted the lumber required must be produced from trees now standing in the forests. Freshly cut lumber is green, that is, it contains a lot of moisture or sap. This moisture should be removed before the material is suitable for use. The sawmill capacity of this country for ordinary peacetime needs in the past has been somewhat greater than is required to fill orders for lumber so that stocks have accumulated at the sawmill and in wholesale and retail yards. Time was thus allowed for stock to be adequately dried or seasoned before it was finally sold to the consumer. During periods when the demand for stock exceeds the capacity of the mills, however, the stock on hand becomes smaller and smaller, the time allowed for seasoning decreases, and if the demand

---

<sup>1</sup>Maintained at Madison 5, Wis., in cooperation with the University of Wisconsin.

becomes great enough the lumber may be sold as fast as it can be cut and without time for seasoning. Such a condition of demand exceeding the production began to develop before Pearl Harbor and has been with us ever since. The backlog of yard stock was exhausted years ago, and it will be many years in the future before stocks can be built up at sawmills and distributing yards for seasoning.

It is immediately advantageous to both the lumber producers and the distributors to sell the stock unseasoned since it means quick turnover of capital invested, reduced labor costs for piling and handling, reduced insurance and carrying charges, and no loss in grade that may accompany seasoning. Nevertheless, the responsible sawmill operators and lumber dealers understand the disadvantages of using unseasoned lumber and would prefer to sell it seasoned. On the other hand, the current demand for lumber of any kind is imperative and leaves them no choice but to sell it as fast as it can be produced. The ultimate home owners are, however, generally unaware of the hazards they will encounter as a result of using the lumber unseasoned.

The GI. in need of a place to live is naturally impatient in his demand for a home but also expects that the materials used are of good quality and suitable for the purpose. He will be bitterly disillusioned when he finds through defects that develop in the structure. that unseasoned material has been used. We have been building houses since our ancestors first landed in this country and have learned how to build better houses than they built, but we still have not learned how to build good houses of unseasoned lumber.

Woods used for construction materials are of two classes: (1) those used for beams, joists, studs, rafters, sheathing, and subflooring, commonly

Report No. R1613

called framing or yard lumber; and (2) those used for flooring, finish, trim, doors, and windows, called finishing lumber or planing-mill products. Most items of framing lumber are customarily air-dried for several months at the mill or distributing yard. At present, however, a large part of the framing lumber is shipped as soon as cut, and the distributors take it direct from the freight car to the building site. Hence, it is nearly as green when delivered as when cut from the tree. Finishing lumber goes from the sawmill to remanufacturing plants where it is kiln-dried before it is made up into finished products. The larger, well-equipped planing mills cannot supply the demand for windows, doors, and interior finish, and plants not equipped with adequate kilns are producing these items from inadequately seasoned lumber.

When lumber dries, considerable shrinkage develops, and this shrinkage should take place before rather than after the material is assembled in a structure or finished article. Unequal shrinkage may cause the individual pieces to warp or twist, to check and split. Good seasoning practice at the mill minimizes these defects, but there is no adequate means of controlling or preventing such defects where unseasoned lumber is used in construction and the seasoning takes place after erection.

Defects that can be expected to develop in conventional construction resulting from the use of unseasoned framing lumber are principally the results of unequal shrinkage, which causes excessive and unsightly plaster cracks, distortion of door and window openings, binding of moving parts, doors that will not latch, openings and cracks that permit air infiltration, and floors that are not level. Shrinkage around chimneys, fireplaces, and plumbing pipes creates leaks and sometimes a fire hazard. Warping, twisting, checks, and splits also weaken the structure, and in some cases <sup>result in</sup> distortion

of roof or walls; nails driven into unseasoned lumber loosen up later when the lumber dries. Unseasoned lumber also adds a decay hazard, particularly over basementless structures. Shrinkage of inadequately seasoned finish lumber causes open miter joints in door and window casings and similar finish, and causes doors and panels to warp and twist. Shrinkage of flooring causes open cracks between floor boards, creaking and noisy floors and stair treads. Blue stain present in exterior finish <sup>may</sup>/cause paint discoloration.

The defects naturally result in greatly increased maintenance costs, disfigurement that cannot be concealed, and dissatisfaction on the part of the owner with his investment. It may be expected that owners will not take pride in such homes, but will attempt to sell or dispose of them just as soon as better houses are available.

In producing prefabricated houses of wood the same necessity for seasoned material is equally important. The parts must have practically no shrinkage from the time they are machined and assembled in shops until they are erected on the site; otherwise the units will not fit together properly. Unseasoned material does not have such stability. The covering parts of prefabricated floors and walls are generally glued to the framing members, and strong glue joints cannot be obtained with unseasoned material.

The influence of powerful agencies, both Governmental and private, will be required to get properly seasoned lumber back on the market again. It is to the interest of all agencies financing building construction to insist that the materials used be suitable for the purpose, and such agencies can play an important part in establishing suitable moisture content specifications and adequate policing to obtain compliance. It will also be necessary to establish economic incentives by which it will be to the interest of manufacturers and dealers to distribute seasoned stock.

Pending the time when seasoned stock is again available the individual builders can help themselves by certain expedients that can be employed to obtain some degree of seasoning before the building is plastered. For example: (1) Purchase framing lumber as far in advance of actual construction as possible and have it piled on stickers according to good piling practice. Sixty days for inch lumber and 90 days for 2-inch lumber will generally provide fairly well-seasoned stock. (2) Halting the construction after the building is framed, sheathed, and roofed and before it is lathed will result in comparatively rapid seasoning. It may take 60 days, however, to dry the stock to a well air-dried condition. (3) Since the vertical shrinkage of joists and plates is cumulative, there will be more evidence of shrinkage in the second floor than in the first floor of an all-frame house. On this basis, one-story houses will suffer less than two-story houses and owners might consider one-story houses when these can be made to suit their needs. (4) In some localities dry kilns can be found where the owners are willing to kiln dry stock for a fee. In a suitable kiln, framing lumber up to 2 inches thick can be adequately dried in about 1 week. (5) Order interior finish and trim from companies that are adequately equipped with dry kilns or that are in a position to obtain properly seasoned material.

Time and money expended to get dry lumber or to dry it before the house is enclosed will pay good dividends in reducing maintenance, increasing the value, and satisfaction of ownership of the completed structure.