

TECHNICAL NOTE NUMBER 151
FOREST PRODUCTS LABORATORY - U. S. FOREST SERVICE - MADISON, WISCONSIN

CAUSE AND PREVENTION OF BLUE STAIN

Blue stain is the most troublesome of the sap stains which discolor wood. It is caused by a fungus which germinates on the sapwood and penetrates its cells in search of starches and sugars. This action of the fungus causes no perceptible weakening of the wood, but the discoloration which results lessens the value of the lumber for many purposes, such as interior finish, flooring, and basket and box veneers. The stain at first may be no more than a bluish spot or streak on the surface, but later, as the fungus develops, the discoloration may involve all of the sapwood and become too deep to surface off. The blue-stain fungus can revive in timbers after long periods of inaction brought on by lack of moisture.

Warm weather and a comparatively high moisture content of the wood are the most favorable conditions for the growth of the blue-stain fungus. Most of the infection occurs in green lumber which is piled without ample ventilation between the boards, in the mill yard or during shipment.

As yet no absolutely dependable means of preventing blue stain has been found by the U. S. Forest Products Laboratory, other than kiln drying the lumber. The ordinary kiln-drying process is entirely effective against blue stain, but there are many cases in which this means of prevention is not feasible. Staining during air seasoning can be largely controlled by open piling. This affords free circulation of the air and so hastens drying, but not always sufficiently under adverse weather conditions to discourage the stain fungi.

The treatment of the green lumber with antiseptic dips is the most effective method which is generally applicable at the present time. For this purpose the chemicals commonly used are sodium carbonate (soda ash) and sodium bicarbonate (ordinary baking soda). Neither is a sovereign remedy under severe conditions, such as continuous rainy periods during the warm months, but will go far towards keeping the stock clean. In rainy seasons an 8 per cent solution of sodium carbonate is desirable, but in drier weather half this strength should suffice.

A high grade of soda ash should contain about 58½ per cent alkali, and every effort should be made to conform to this standard of purity. When sodium bicarbonate is used, an 11 per cent solution should be employed in wet weather and 5 to 6 per cent in dry weather. This chemical when dry should contain about 37 per cent alkali.

In the use of these chemical dips, the following points should be kept in mind: (1) The solutions should be carefully mixed and the concentrations in the dipping tanks should be kept uniform by means of a hydrometer. (2) The solutions should be heated when applied, the bicarbonate solution not above 120° F., however, because it is broken down into the carbonate by excessive heating. (3) The stock should be dipped as it comes from the saw. (4) After dipping it should be carefully piled so as to insure ample ventilation. Narrow, chemically-treated cross strips are preferable to the wide untreated strips commonly employed, since treated crossers tend to eliminate stain at the point of contact.