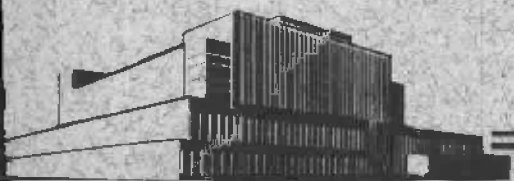


# DETECTION OF FIGURED WOOD IN STANDING TREES

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# DETECTION OF FIGURED WOOD IN STANDING TREES

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An investigation of figured black walnut revealed the possibilities of detecting certain localized distortions or deviations in the grain of the wood by direct examination of standing trees. The curly grain in walnut, for example, usually has not been recognized until the trees were felled -- frequently not until the logs were well along in process of manufacture of lumber or veneer. The work here reported was done in connection with exploratory work on the possible inheritability of such well-recognized types of figured wood as curly grain in black walnut and certain other species and as bird's-eye figure in sugar maple.

The purpose of the study was to detect and identify figured wood in standing trees without doing serious damage to them. The trees for propagation must be in good growing condition in order to permit determination of whether structural characteristics of the wood can be transmitted from the parent trees to their progeny by grafting or rooting and through the seed.

Certain localized distortions in the grain of wood have supplied large amounts of figured lumber and veneer for decorative furniture and panels for many years. Nevertheless, there has been little or no information on the causes or even on the general occurrence of figured wood, other than recognition that some trees or logs contained figured wood while others did not. Increased attention, however, is being given not only to the detection of the usually scarce trees with outstanding characteristics but also to whether such scarcity can be alleviated by reproducing certain favorable types.

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

## Examinations of Curly Grain

One black walnut tree with exceptionally curly grain was located near Iowa City, Iowa, after it had been felled. Some examinations of the available parts of that tree showed that the figure extended from the stump, throughout the tree, and well into the large branches. The wood was well figured for at least one-half of the radius of the trunk from the pith to the bark on all sides of the tree. Samples of stump, trunk, and branch material were taken to the Forest Products Laboratory for further examination of the bark and wood.

The outer bark of the samples, which showed no good indications of figure, was readily removed with a carpenter's drawshave as far as the softer layers of the yellow-colored inner bark. (Subsequent work has shown that rough bark can be readily removed on standing trees with a drawshave.)

The smoothed small and flat surfaces of the inner bark showed the same curly deviations (fig. 1) as in the wood (fig. 2). Figure 3 shows a relatively large chip split from the stump of the tree with the typical undulating distortions of curly grain in the arrangement of the fibers and other elements of the wood. Thus, the examinations showed the same grain directions or deviations in the contiguous bark and wood of the tree.

Further examinations were made of the bark and wood of large numbers of other walnut trees in the woods. Such trees, however, usually showed essentially straight grain rather than the curly grain so desirable in decorative furniture and panels. Figures 4 and 5 show the typical straight grain that was encountered in practically all of the trees examined in these studies. The predominant occurrence of straight grain further indicates the scarcity of exceptionally figured trees.

## Applications for Method of Detecting Grain Direction

The general method of determining grain direction in trees by removal of some or all of the bark has considerable application in evaluating certain structural features of the wood. For example, users of sugar maple timber frequently have examined trees in the woods in attempts to find the indentations in the grain that make up bird's-eye figure. Common practice was to blaze with an ax several places on the sides

of trees to detect and evaluate the bird's-eye figure. Such examinations made it possible to segregate for special handling those trees with particularly good figure from trees cut for ordinary maple veneer or lumber in which the occurrence of the bird's-eyes might even be undesirable.

Investigations by the Forest Products Laboratory show further that the bird's-eye figure can be detected, when abundant in large trees, even in the rough outer bark, particularly when the bird's-eyes are relatively large in diameter. In their early stages, as in relatively young sugar maple trees, the bird's-eyes are small in size and frequently appear only as tiny dimples in the outer wood when the bark is completely removed. Blazing kept to small and particularly narrow areas is likely to cause only minor if any damage to the growth of the tree, and there is little danger of attack by fungi or insects. It is practical, therefore, to use those methods in selecting and reserving even small trees, particularly for genetical studies.

This research at the Forest Products Laboratory has given information on an additional tool for use in detecting and recognizing certain trees with particularly valuable or unique structural characteristics. The methods of identifying grain deviations and directions in standing trees have applications for tree breeders and forest managers. A recently discovered stand of natural hybrid poplars, presumably originating from sprouts of a single tree, was found to include curly grain in several trees when the wood was cut into veneer. Examination of the remaining trees permitted selection of certain ones with particularly favorable intrinsic structure of the wood and good vigor for propagation in basic studies of the inheritability of the figure and its reproduction by rooting of scions.

The general methods of determining orientation of grain in standing trees also has application in detecting undesirable characteristics -- for example, spiral grain, which weakens wood and causes warping of lumber. In some studies of spiral grain, the amounts and directions of the spirals were determined by stripping bark for actual measurements on standing trees. Other trees are frequently examined for grain direction without appreciable removal of even the inner bark in order to select intrinsically straight-grain wood for certain forest products studies. Extreme spiral grain in some trees also is shown by the ridges and furrows in the outer bark, which follow definitely spiral patterns on the trunks of standing trees. Patterns that can be observed in the bark undoubtedly will provide considerable information on the fiber deviations and directions in the wood that ordinarily are obscured in the trees.



**Figure 1. --Black walnut inner bark showing indications of figured wood beneath. Slightly magnified.**

**Z M 7361 F**



Figure 2. --Figured black walnut wood adjacent to bark shown in figure 1. Note curly grain as indicated by the lines of pores. Slightly magnified.

Z M 7362 F



Figure 3. --Chip of figured black walnut showing the curly grain. Natural size.

Z M 7360 F

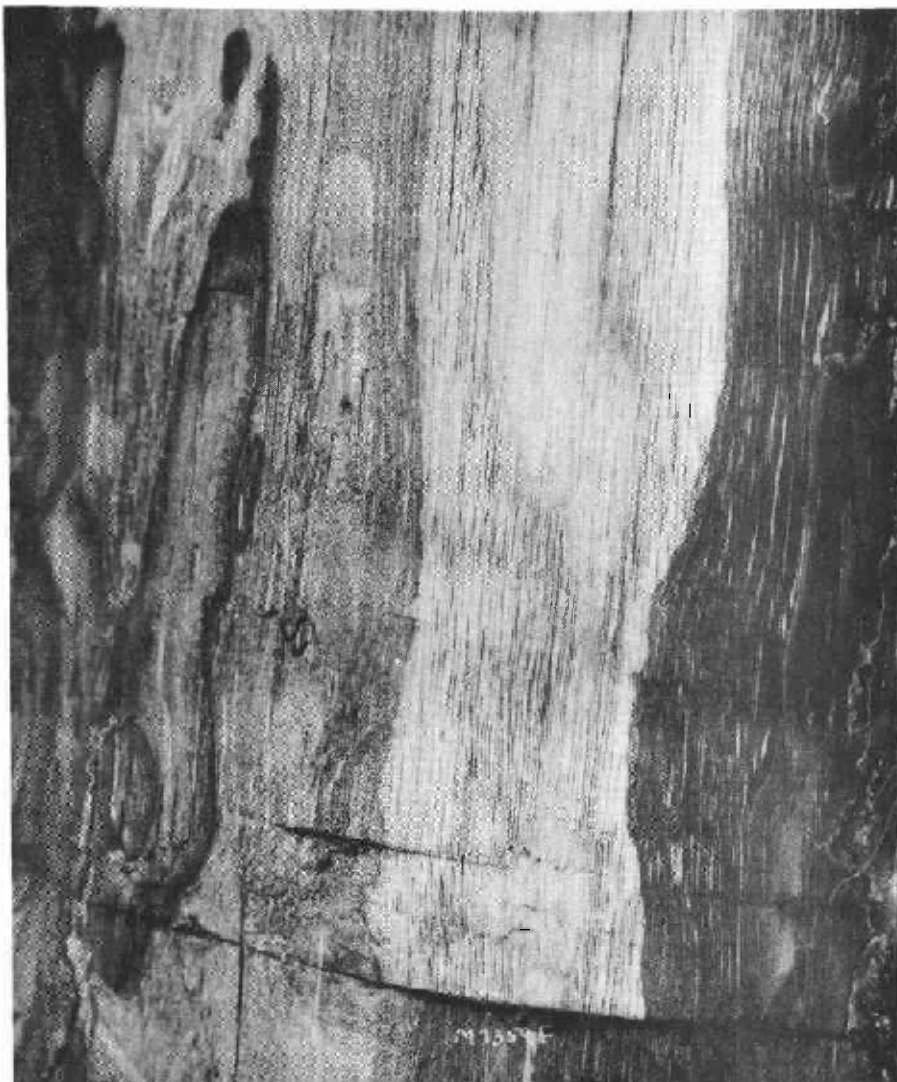




**Figure 4. --Inner bark of black walnut overlaying straight grain wood. Slightly magnified.**

**Z M 7357 F**





**Figure 5. --Black walnut wood with straight grain. Slightly magnified.**

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