

PAINTING HARDWOODS IN FARM BUILDINGS

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By
F. L. BROWNE
Senior Chemist

The hardwoods as a class are less satisfactory than the softwoods for purposes of exterior painting. From the point of view of painting, woods are classified in five groups of which groups I and II, the choice woods for exterior painting, consist entirely of softwoods (the cedars, redwood, cypress, the white pines). The best hardwoods for exterior painting fall in group III along with ponderosa pine, the spruces, the hemlocks, and the true firs:

Group III	(Aspen)	Diffuse porous hardwoods with small pores and moderate density (sp. gr. 0.32 to 0.46)
	(Basswood)	
	(Cottonwood)	
	(Magnolia)	
	(Yellowpoplar)	
Group IV	(Beech)	Diffuse porous and ring-porous hardwoods with pores no larger than those in birch and high density (sp. gr. 0.44 to 0.60)
	(Birch)	
	(Blackgum)	
	(Maple)	
	(Sweetgum)	
(Water tupelo)		
Group V	(Ash)	Hardwoods with pores larger than those in birch, usually ring-porous (exception walnut) and usually of high density (exception chestnut)
	(Chestnut)	
	(Elm)	
	(Hickory)	
	(Oak)	
(Walnut)		

The hardwoods of group III can be painted with ordinary house paints and barn paints in exactly the same ways as are customary with softwoods and, if well painted with good paints, should hold paint well for about 4 years before repainting becomes necessary (6 or 7 years in the case of iron oxide red paint of good quality). These woods perform reasonably well when cut into the siding patterns often used with the lighter softwoods, such as bevel siding 1/2 to 3/4 inch thick at the butt although some of them (example cottonwood) need to be nailed firmly at intervals of no more than 16 inches to prevent bowing. Even when left exposed to the weather without paint or after paint has worn out, hardwoods of group III perform at least as well as softwood of Group III or IV because these hardwoods generally have less tendency to split than the softwoods mentioned and the hardwoods do not have the tendency for summerwood bands to shell out as the softwoods do.

Hardwoods of group IV can be painted with house paints according to customary practice but the durability of the paint is a year or more shorter and the form of failure of the paint is such as to make repainting difficult and uncertain unless all old paint is first removed, which is expensive. Pure white lead paint is less subject to the bad form of failure than are the harder types of paint containing zinc oxide. On the hardwoods the paint tends to scale off in rather large flakes having no observable relation to the grain of the wood underneath whereas on the softwoods of group IV (southern yellow pine, Douglas-fir) the paint usually flakes at first from the bands of summerwood only. (Exceptions to this rule fall beyond the scope of this discussion because they depend upon factors other than the nature of the wood.) Red iron oxide barn paints made with little or no varnish probably fail much like pure white lead paint (easy to repaint) but those made with much varnish may flake badly.

For suggestions about house and barn paints and methods of using them see reference 2 at the end of this mimeograph.

For interior surfaces not exposed to weather, hardwoods of group IV take enamel finishes, using enamel undercoaters and enamel finish coats, very well. Where exterior enamel systems can be used out of doors these woods also serve well and good enamels (the old carriage finishes for example) are durable and readily repaintable on these woods. Unfortunately, the enamel systems are not practicable as house and barn paints because of high cost for both material and labor of application.

Hardwoods of group V contain pores so large that they are not filled and leveled off properly by ordinary house paints. The pores then become foci for early paint failure and the failure is inclined to be in large flakes. Proper painting or enameling should begin with the operation of filling the pores with a paste wood filler, which for exterior use should contain some white lead. Filler must be brushed on and, shortly after, wiped off with rags. Obviously this is not practicable for house or barn painting. When it can be done properly, however, reasonably durable jobs of enameling (not ordinary painting) can be done on hardwoods of group V.

Hardwoods of groups IV and V when exposed to the weather without paint or with inadequate paint protection, or if water gets behind them, have very marked tendency to warp or cup and pull away from fastenings. If firmly nailed there may be splitting of the boards. Thin boards cup and warp worse than thick ones from surface wetting and drying. For these reasons 1/2 inch siding of heavy hardwoods is impracticable. Boards for exterior exposure should not be thinner than 3/4 inch at any point and preferably no wider than 6 inches. They should be very firmly nailed.

Ordinary iron nails, when they corrode, stain many hardwoods (and some softwoods) badly because iron rust reacts with tannin in the wood to form ink. Corrosion-resistant nails minimize such trouble. (Paint over the nail heads cannot be relied upon to prevent corrosion of nails).

If there are joints between painted boards of some hardwoods and rain water seeps into them during storms and then drains back over the paint, colored substances from the wood may be streaked over the paint. Walnut, the oaks, and chestnut are known to be troublesome in this way. Condensation behind siding running out at joints may have the same result. Painting edges of boards joined together and backs of boards where there is danger of condensation minimizes the trouble but adds to the expense of the job. Careful attention to the design of structures and good carpenter work during erection to avoid joints into which water can penetrate are the best and cheapest ways of avoiding streaking of this kind.

Quarter-sawed boards of hardwoods hold paint slightly better than plain-sawed boards but the difference is comparatively small in contrast to softwoods where the difference in favor of edge grain over flat grain boards is considerable. Rate of growth is not known to be a factor in paint holding by hardwoods, though among softwoods, slow-growth wood holds paint appreciably better than fast-growth wood. Among both hardwoods and softwoods, paint is held longer the lower the density of the wood.

Where hardwoods of groups III and IV are used for exterior coverings of buildings, consideration should be given to alternative decorative procedures to avoid use of paint.

1. Where practicable, let the wood weather naturally but use thick boards, well nailed with corrosion resistant nails. It is appropriate to use sawed (unplaned) boards for such uses.

2. For color or variety of effect, consideration may be given to use of ordinary shingle stains, most of which are of dark colors. So-called white stain (which is really very thin paint) or gray stains are practicable but less durable than the dark colors. Boards with sawed surfaces hold stains better than planed boards.

3. If annual renewal of a one-coat finish with material costing about \$1.25 a gallon and spreading 800 square feet per gallon on planed surfaces is considered practicable, a natural wood finish can be used. Ordinary boiled linseed oil or soybean oil with a little paint drier is as good as anything else for the purpose. Apply the oil, let it sink into the wood for 30 minutes, then wipe any excess from the surface with clean rags. (Burn the oily rags promptly). Renew in the same way after 6, 12, and 18 months, thereafter annually.

References

1. "Behavior of House Paints on Different Woods" - mimeograph R1053.
2. "When and How to Paint Homes and Farm Buildings" - mimeograph R962.

Obtainable on request from the Forest Products Laboratory, Madison, Wisconsin.