



## Producing Spalted Wood

In the decorative wood market, spalted wood is in high demand. Spalting is caused by certain white-rot decay fungi growing in wood—primarily hardwoods such as maple, birch, and beech. The fungi create “zone lines” in the wood where territories of competing fungi meet. The unusual coloration—black, pink, gray, and multicolored streaks—may result from reactions between the wood, the decay fungi, and insect deposits. If these decay fungi are allowed to grow for too long, however, the strength of the wood is diminished.

The biology and taxonomy of many decay fungi are well known; however, the art of creating spalted wood continues to develop. The following information is directed to those interested in producing spalted wood.

### Decay Fungi

Certain white-rot fungi must be present to create the decorative appearance of spalted wood. Because fungal spores are airborne, inoculating (adding fungi to) the wood is not necessary—the spores are already present. However, further exposing the wood to decaying vegetation could give you a head start. The predominant fungi present in various locations, especially in an area where hardwoods are growing or decaying, could determine which fungi take hold first and what characteristics (such as color) your wood will likely develop. (See **Types of Decay Fungi**.)

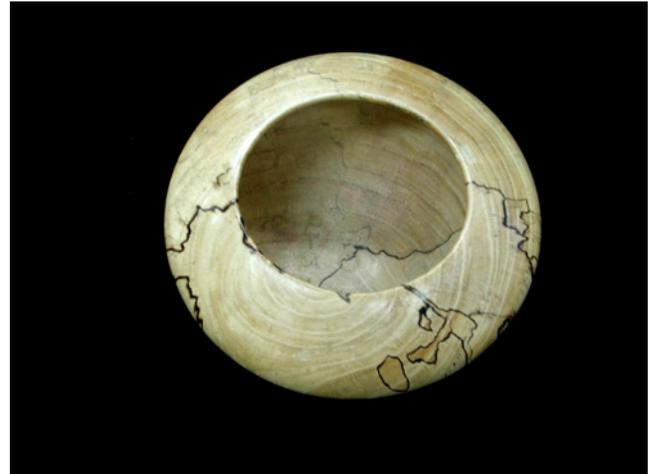
Try several decaying methods simultaneously. Be sure to keep careful notes on each method so that those with favorable results can be duplicated.

### Temperature

When the temperature cools, the wood decay process slows. At temperatures less than 50°F, the decay process is very slow; as temperatures drop further, fungi lay dormant until the temperature increases.

### Moisture

Fungi need water. Wooden furniture in a home does not decay, because free water is not available for fungal growth. However, at approximately 30% moisture content, wood does contain free water, and decay (spalting) can occur. The moisture content of wood is directly related to humidity—for decay to occur, humidity would need to hover around 100% (foggy conditions, or wood cooled below the dew point to condense water). To decay under



conditions of lower humidity, wood would need to be moistened (rain, water from a garden hose, contact with wet soil).

Freshly cut (green) wood has a moisture content greater than 40%, so all that is necessary in this case is to prevent the wood from drying out. Green wood could be kept at 100% humidity (such as in a plastic bag) or water could be added to keep the wood wet enough to decay. Wood can be too wet for some fungi to grow, so do not continually soak the wood or keep it under a spray of water.

### Food

Decay fungi eat wood. White-rot fungi eat both cellulose and lignin in wood. (Lignin is the glue that holds wood together and is what is removed from wood when paper is made.) Fungi can be “fed” to increase growth, but encouraging the wrong type of fungal growth is also a risk. Brown-rot fungi—another major kind of decay fungi that primarily eat cellulose—will cause the wood to take on a brown color but may also cause the wood to crack across the grain, shrink, collapse, and be crushed into powder. Brown-rot fungi are usually associated with softwoods. Sugar is an ideal food to feed fungi, but very high levels can also be toxic to fungi.

### Timeframe

Be patient—it may take months or years for spalting to occur. However, if the wood decays for too long, it may become too deteriorated for use.

## Experiences Creating Spalted Wood

The following are experiences of individuals who created spalted wood. The experiences of Todd, Rob, and Ron are documented in an article, *Buried Treasure: Learn How Three American Turners Create Their Own Spalted Wood, and Then Firm It Up For Turning*, posted at [www.woodturningplus.com/buried\\_treasure.htm](http://www.woodturningplus.com/buried_treasure.htm). The article, written by Ron Hampton, was originally published in *Woodturning* magazine (Issue No. 73).

*A live tree is cut into rounds that are 5 to 6 inches longer than the diameter. The rounds are stood on end in a fungus-strewn area in the shade; the wood is wet and is covered with wood shavings. Within a year or so, spalting occurs.*

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*Todd has created many beautiful spalted pieces by burying rough-turned green wood in moist sawdust for about 6 months. (In humid climates, the burial time would be much shorter.) The sawdust often stains the wood in a desirable way, while the fungus is creating other decorative marks. In addition, mushrooms and roots grow and leave root trails and irregularities in the wood.*

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*Rob makes a “spalting sauce” by mixing a can of beer, 1-1/2 tablespoons of ammonia, 1 cup of a nitrogen-rich fertilizer (mixed double strength), and oak leaves mixed with grass clippings. He chops the ingredients in a food processor to create a pastelike mixture, then covers the surface of a rough-turned vessel with the mixture. He places the turning in a plastic bag, and leaves the bag in a warm place for several weeks. When he is satisfied with the spalting, he finishes turning the vessel.*

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*Ron put a large piece of walnut in a plastic bag and forgot about it for 6 months, while he built his wood shop. Taking a rest one day, he opened his garbage sack and found a well-spalted piece of walnut. He felt as though he had discovered a magical treasure, having put a \$50 piece of wood in the plastic bag and pulling out a piece worth \$1,000.*

## Cautions

Although the white rot fungi responsible for the decorative appearance are not pathogenic (a health problem), there might be some molds associated with the spalting process that could cause allergies in people. It is also possible that some pathogenic molds, such as *Aspergillus fumigatus* (responsible for “farmers lung”), might be present, so it is always a good idea to work in well-ventilated areas.

## Types of Decay Fungi

**Advanced (Typical) Decay**—Older stage of decay in which destruction is readily recognized—the wood has become punky, soft and spongy, stringy, ringshaked, pitted, or crumbly. Decided discoloration or bleaching of the rotted wood is often apparent.

**Brown Rot**—In wood, any decay in which the attack concentrates on the cellulose and associated carbohydrates rather than on the lignin, producing a light to dark brown friable residue—hence loosely termed “dry rot.” An advanced stage where the wood splits along rectangular planes, in shrinking, is termed “cubical rot.”

**Dry Rot**—A term loosely applied to any dry, crumbly rot but especially to that which, when in an advanced stage, permits the wood to be crushed easily to a dry powder. The term is actually a misnomer for any decay, since all fungi require considerable moisture for growth.

**Incipient Decay**—Early stage of decay that has not proceeded far enough to soften or otherwise perceptibly impair the hardness of the wood. It is usually accompanied by a slight discoloration or bleaching of the wood.

**Heart Rot**—Any rot characteristically confined to the heartwood. It generally originates in the living tree.

**Pocket Rot**—Advanced decay that appears in the form of a hole or pocket, usually surrounded by apparently sound wood.

**Soft Rot**—A special type of decay developing under very wet conditions (as in cooling towers and boat timbers) in the outer wood layers caused by cellulose-destroying microfungi that attack the secondary cell walls and not the intercellular layer.

**White-Rot**—In wood, any decay or rot attacking both the cellulose and the lignin, producing a generally whitish residue that may be spongy or stringy rot, or occur as pocket rot.

## Additional Information on Decorative Wood

Forest Products Laboratory. 2002. Blue stain. Techline. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 2 p. ([www.fpl.fs.fed.us/documnts/techline/ii-2.pdf](http://www.fpl.fs.fed.us/documnts/techline/ii-2.pdf))

Forest Products Laboratory. 1999. Wood handbook—Wood as an engineering material. Gen. Tech. Rep. FPL–GTR–113. Chapter 13: Biodeterioration of wood. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 16 p. ([www.fpl.fs.fed.us/documnts/FPLGTR/fplgtr113/Ch13.pdf](http://www.fpl.fs.fed.us/documnts/FPLGTR/fplgtr113/Ch13.pdf))

Thomas, Margaret G.; Schumann, David R. 1993. Income opportunities in special forest products—Self-help suggestions for rural entrepreneurs. Agric. Infor. Bull. 666. Chapter 7: Decorative wood. Washington, DC: U.S. Department of Agriculture, Forest Service. 5 p. ([www.fpl.fs.fed.us/documnts/usda/agib666/aib66607.pdf](http://www.fpl.fs.fed.us/documnts/usda/agib666/aib66607.pdf))

The Internet is an excellent place to find information. Simply use a search engine (such as Google, Yahoo, Altavista, or Infoseek) and enter the words “spalted wood” for the search.