



Spider Heart

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Spider heart, or star shake, is a tree or log defect that consists of discolored cracks radiating from the center of a log, perpendicular to the annual rings. The black cracks generally extend two or three feet up from the base of the tree. Spider heart causes sawn lumber to have severe splits resulting in a loss of volume as well as grade. It is common practice for the log scaler to deduct footage from the gross scale of the log to compensate for the loss.

Spider heart that breaks through the surface of the bark is often called a “frost crack”—a defect which previously was blamed on severe cold. Alex Shigo and Heinz Butin, former researchers with the U.S. Forest Service published a research paper in 1981 titled “Radial Shakes and Frost Cracks in Living Oak Trees.” This report (NE-478) states that ring or radial shakes (like spider heart) isn’t caused by cold, wind, or any other mechanical factor, rather it is caused by a wide variety of wounds resulting in infection. Cold and wind and other stresses can cause a previously infected tree to get worse. Shigo and Butin list fire, logging damage, grazing animals, branch stubs and multi-stem sprouts as likely causes for damage to young trees. Spider heart seems to be more common in oak than any other species.

A recent addition of the Northeast Wisconsin Forest Pest Update (4/14/11), attributes Shigo with the observation that early damage to trees which later becomes spider heart is a bacterial infection. Bacterial infections in oak, as I later learned from Walter Shortle, Forest Service scientist, are anaerobic bacteria which flourish without oxygen. These bacteria produce enzymes capable of breaking down wood’s cellular structure. Bacterial infected oak lumber may often look normal but smells like ammonia. Drying infected oak is also a challenge because the water contained in the wood structure does not move out in a predictable way resulting in inconsistently dried lumber.

Walter Shortle went on to emphasize a wounded tree may quickly compartmentalize the damage and grow over the wound. Or, a wounded tree can be infected by decay-causing fungi which may cause the tree to decline. These fungi, unlike bacteria festering inside some oaks, need oxygen to survive. The key seems to be preventing damage to young trees.

References:

Butin, Heinz, Shigo, A.L. 1981. Radial Shakes and Frost Cracks in Living Oak Trees. USDA Forest Service, Research Paper NE-478. 21p.

Northeast Wisconsin Forest Pest Update. 2011. “Spider Heart or star Shake in Oak”. Wisconsin Department of Natural Resources.

Shortle, Walter. 2011, Phone conversation.



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