



## *Fusiform Rust: Another Threat to the Health of Forests of Mississippi*

Fusiform rust is of major concern in loblolly and slash pine stands in Mississippi and throughout the southeastern US. Infections occur early in the rotation usually be-



**Figure 1: Branch canker with associated spore development.**

fore the age of 5. Branch-, Fig. 1, and stem-cankers, Fig. 2, are both often associated with this disease. Heavily infected stands have nu-



**Figure 2: Older infection subject to burning in case of fire.**

merous branch and stem cankers. If the infection is on the main stem within the first 5 years tree death may occur. As the trees age wind breakage at the canker site becomes common especially following high wind and/or ice events. And is intensified in recently thinned stands where trees with stem cankers were not removed. On older trees these infected areas may become laden with resins. These areas burn during wildfires or prescribed burns, Fig. 3, if the fires are hot enough to reach the canker sites.



**Figure 3: Stem cankers ignited by high flame heights of strip heading fires.**

The rust gets its common name from the yellow-orange (rust) colored spores produced on the surface of the spindle (fusiform) shaped galls on the branches or stem. These spores are produced in the early spring. They spread to the newly forming oak leaves where hair like structures, Fig. 4, are produced on the undersurfaces of the oak leaves where other spore stages are produced that



**Figure 4: Fusiform rust developing on underside of oak leaf.**

will infected other pines in stand (Fig. 5).

It is important that land managers take steps to deal with fusiform rust that will minimize rust problems and protect our valuable forest resources. Numerous steps can be taken to reduce the impact of fusiform rust. Use of rust resistant seedlings is an option and should be considered when obtaining seedlings for regeneration purposes. One can also consider using site preparation techniques that will reduce oak trees unless they conflict with other management objectives. Seeds from resistant sources can also be used when direct seeding is the chosen method of regeneration. These seeds should be treated with approved bird and rodent repellents to prevent losses.

As the stands develop they should be monitored for rust infections. Thinning prescriptions should include options to manage the infection. Severely infect stands will require sanitation that can be



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time consuming and costly. It is wise to have prevention strategies included in the management plan

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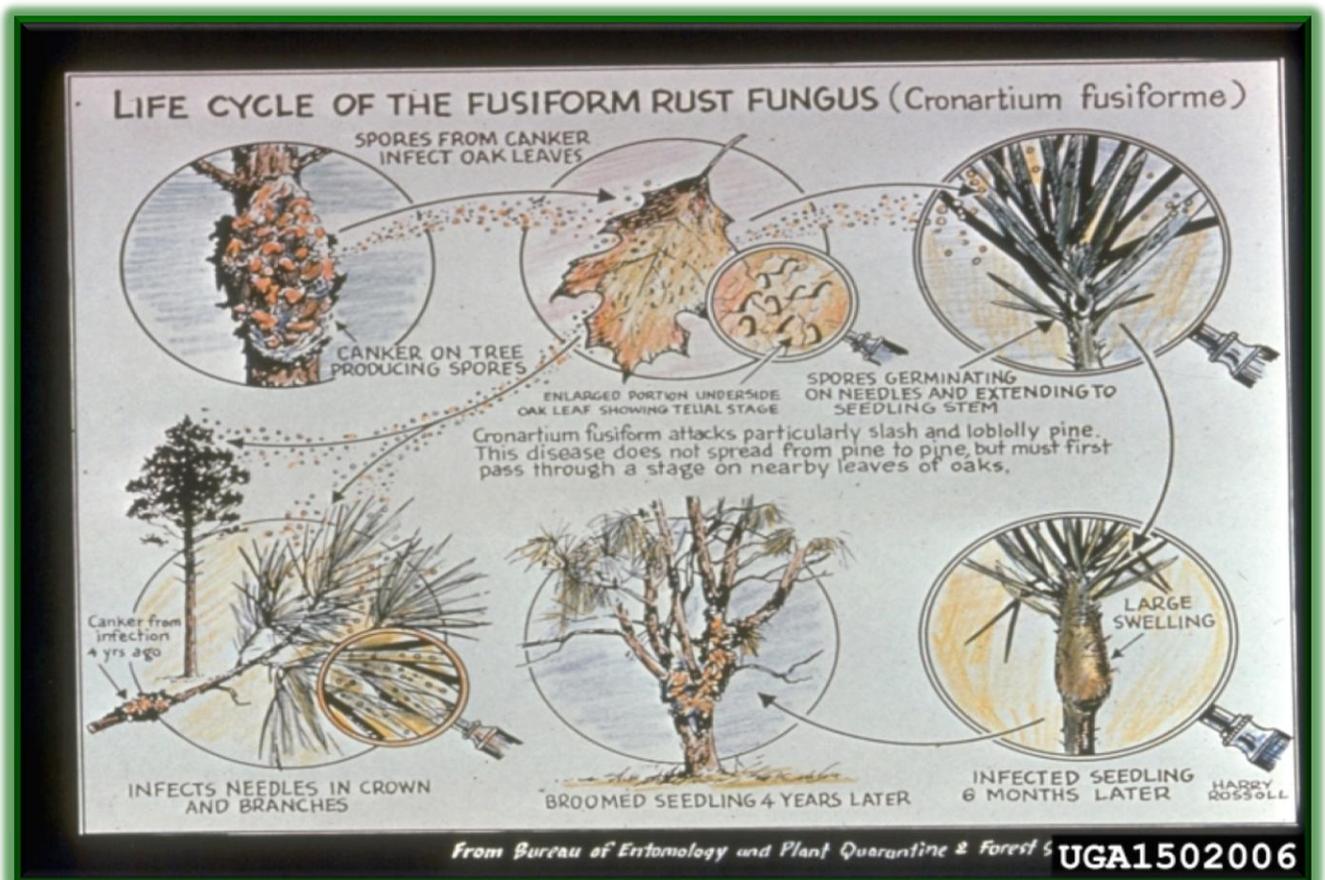


Figure 5: Life cycle of fusiform rust (*Cronartium fusiforme*).