



# TEXAS A&M FOREST SERVICE

## *Forest Health: Annosum Root Disease*

Annosum root disease (ARD) in Texas, impacts loblolly and slash pine and eastern redcedar. Slash pine is the most severely affected, but the disease is very localized and not considered a major problem. It is most often found in central and northern East Texas. The fungus typically enters the tree through a wound, grows through the heartwood into the roots, and causes decay in the root system. Diseased trees are subject to windthrow and breakage.



### **Identification:**

The fungus *Heterobasidion annosum* (formerly called *Fomes annosus*) causes ARD. A fungus growth extending from the trunk of the tree is called a “conk.” The presence of conks at the base of stumps or standing trees provides positive ARD field identification. When fresh, conks are tan to brownish on the upper surface and white with tiny pores on the lower surface. Colors darken with age. They are rubbery and difficult to tear. Conks are often at the base of dead or dying trees, stumps, or under root masses of windthrown trees. On sites where a deep litter layer accumulates, conks may appear on the north side of trees where humidity is higher. In Texas, most conks develop from December through March when temperatures are cooler and moisture is more abundant. Insects may destroy the conks before summer or fall.

Even though the disease may be present in an area, conks may not develop on infected trees. This is common in stands that have been burned. If no conks are found, the presence of the fungus can be confirmed by culturing from suspect trees in the laboratory to identify the disease. Bark beetle infestations are often associated with ARD.

If ARD is identified in a few stands, strongly suspect the disease in other stands if there is some combination of the following:

- Pine stands with dead and dying trees often in clusters or rows.
- Trees leaning or blown over from lack of supporting roots.
- Stringy white rot of wood in roots and/or butt.
- Sparse crowns with off-color needles, often with abundant cones.
- Resin-soaked root areas with discolored, dead, or rotted end sections.
- Mortality in second or third year following thinning and continuing for several years.
- Pine stands infested with southern pine beetles or Ips bark beetles.

### **ARD Soil Hazard Rating:**

The most consistent indicator of high hazard sites is well-drained, sandy soil (70% or more sand) to a depth of at least 12". Organic soils and soils with indicators of poor internal drainage (typically clay soils) are a low hazard. A high ARD hazard site will always remain so and will require careful management if pine is to be grown. In Texas, any pine stand may have ARD, although vigorous growing trees on the proper site may suffer less damage. A high haz-

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ard site is one on which ARD can be reasonably expected to cause mortality and growth loss of a value greater than the cost of prevention.

## Prevention:

To prevent ARD, maintain healthy stands and recognize high hazard sites. Trees planted out of their natural range on high hazard sites are more susceptible. Longleaf pine is slightly less susceptible on high hazard sites. Planting on wider spacing and delayed thinning should help avoid widespread infection. ARD typically enters the stand when fungal spores land on freshly cut stump surfaces. The fungus grows from the stump into nearby live trees via root grafts or contacts. To prevent ARD, treat stumps with borax whenever thinning in a high hazard area. Thinning during summer may reduce the chances for infection since spores are usually not present during hot, dry weather. Prescribed burning during winter may help reduce the spread of the disease by destroying fungus spores.

## Control:

Once ARD is established and substantial mortality is occurring, control is necessary. Thinning is very risky because root damage promotes infection and the residual stand will be expected to deteriorate rapidly. The stand should probably be , unless losses can be absorbed until remaining trees reach sawtimber size. The higher sale price may make up for the loss. The site may be regenerated in pine (ARD will cause a small percentage of seedling mortality). The problem usually becomes apparent in a stand for the first time a few years after a thinning cut, often when trees are close to sawtimber size.

If the stand has a localized group of infected trees, salvage the trees including a buffer strip of green trees as wide as the average height of the dominant trees, and treat the stumps with borax. If southern pine beetles or Ips bark beetles are present or are a potential hazard on high ARD hazard sites, their prevention or control must be reconciled with recommendations for ARD.

## Thinning on High Hazard Soils:

Always cover freshly cut stumps with at least 1/8" of borax within 24 hours of harvest. Borax (Sodium Tetraborate Decahydrate) is sold under several names: Borax,

Sporax, Twenty Mule Team Borax, etc. The best method is to sprinkle material "salt-shaker" style. These applicators are available in one or two pound sizes. At proper rates of application, one pound of product will cover 50 square feet of stump surfaces: 260 six-inch stumps, 158 eight-inch stumps, 80 ten-inch stumps, or 60 twelve-inch stumps.

