CENTRAL HARDWOOD NOTES

Oak Decline

Oak declines are complex plant diseases that result when trees are first stressed by environmental factors and/or living organisms and are then invaded and sometimes killed by opportunistic secondary organisms.

Predisposing stresses		**Mortality-causing secondary organisms**
Environmental	Biotic	
Drought	Defoliation by insects (e.g., gypsy moth)	Bark borers (Two-lined chestnut borer)
Soil flooding		Root pathogens (Armillaria)
Winter injury	Defoliation by diseases (e.g., oak anthracnose)	Bark pathogens (Hypoxylon)
Late spring frosts		
Highway deicing salt		
Air pollution		

Some of the characteristics of declining trees may be:

1. Reduced shoot and diameter growth; smaller leaves
2. Dieback of twigs, branches, and roots
3. Sprouts arising from latent or adventitious buds
4. Chlorotic (yellowish-green) foliage
5. Premature fall coloration
6. Reduced stored food reserves
7. Reduced resistance to attacks by opportunistic pathogens and insects
8. Degeneration of mycorrhizae
9. Death

In general, red oaks are considered more susceptible to decline than white oaks Of the red oaks, black, scarlet, and pin oaks are especially sensitive.

Decline is typically initiated by a stressful agent such as an extended drought, or a severe or repeated insect defoliation. These lower tree resistance to pathogens and insect invaders that “healthy” trees can normally resist.

Here are some ways to ameliorate oak decline under forest conditions:

1. Thin stands cautiously to reduce competition for moisture and nutrients among trees. (You may want to check with experts on your specific problem. Some research indicates that tree mortality following stress is often higher in managed stands than in unmanaged stands. Presumably, managed stands contain

larger, faster growing trees that suffer more severely from adversity because of their size, growth demands, etc. Also, regular harvesting may maintain abundant, vigorous populations of *Armillaria* in the soil. Thinning just before or just after defoliation can kill crop trees and should be avoided.)

2. Encourage those species best adapted to each site.
3. Maintain several species to lessen impact of loss of the particular species.
4. Whenever feasible for high value areas, remove dead and dying trees promptly to prevent buildups of secondary invaders such as the two-lined chestnut borer.

References

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