28. Stem Decays of Willow

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Several species of fungi are able to decay live or dead willow wood. The most common decay fungi on willow in the Great Plains are species of *Daedalea* and *Trametes*. Names used in this text follow Overholts. *Daedalea* and *Trametes* are in the family Polyporaceae. Taxonomic relationships in this family are in a state of revision. Species of *Daedalea* and *Trametes* discussed here have been placed in eight genera (*Antrodia, Cerrena, Coriolus, Daedalea, Daedaleopsis, Datronia, Funalia,* and *Trametes*). Names presently advocated by the U.S. Forest Service Center for Forest Mycology Research are listed in the index next to names used in this text.

Hosts and Distribution

Three species of *Daedalea (D. ambigua, D. confragosa, D. unicolor)* and seven of *Trametes (T. hispida, T. malicola, T. mollis, T. rigida, T. sepium, T. suaveolens, T. trogii)* that decay willow have been reported in the Great Plains. *T. suaveolens*, which causes a white-mottled heart rot, is the most common decay fungus that attacks live willows. The other species generally are found on dead wood. These fungi are widespread in the Great Plains and have been found on many willow species. Species that decay willow also decay many other hardwoods and some conifers. No decay resistant willow species are known.

Symptoms and Signs

Often the first outward indication of stem decay is formation of fruiting bodies (sporocarps) on the outside of the stem. This fruiting occurs after the fungus has been present for some time and has caused significant decay. Sporocarps of these fungi are usually annual, but they often grow on the same wood for several years.

Sporocarps vary in appearance, both within and among species and genera. Both *Daedalea* and *Trametes* usually have shelflike sporocarps (fig. 28–1), but some may also be appressed on the stem. The lower surface consists of a layer of pores in which spores are produced. In *Daedalea* species, pore openings usually are mazelike (fig. 28–2), but they may vary from round to almost gill-like. In *Trametes* species, the pores have circular to angular openings. Sporocarps of *Trametes* species often are effused-reflexed and spread out over the surface of the host, but turned up at the upper margin to form a pileus (fig. 28–3). Such sporocarps often have toothlike pores. Laboratory diagnosis is required for specific identification.

The fungus can be found before sporocarps appear by cutting or boring into the stem and looking for rotted wood. At this stage, infected wood must be cultured on agar medium to isolate the fungus for identification.

Daedalea species on willow cause white rot of wood. Most *Trametes* species on willow cause white rot, but two cause brown rot. Most species of these genera decay sapwood, but at least one causes heart rot. Some white rot species cause black lines (zone lines) to form in rotted wood. One, *T. suaveolens*, has a characteristic anise (licorice) odor when fresh.

Live trees with internal rot often exhibit top dieback or poor vigor. If trees with these symptoms are examined, the sporocarps of decay fungi may be found on the lower stem.

Some of these species do not attack live trees, and all can grow as saprobes; their presence on dead wood does not mean they cause tree mortality.

Disease Cycle

The sequence of events leading to decay of living trees by some fungi is as follows: Openings in the bark

Figure 28–1. Pileus of *Daedalea confragosa*, showing shelflike growth of sporocarps.

(bacteria, nondecay fungi) to enter the wood. These organisms alter the wood and allow decay fungi to invade and decay the altered wood. Only the wood present at the time of wounding is susceptible to decay. After growth and subsequent wood decay, the decay fungi produce sporocarps to complete their life cycle. The sequence of events has not been examined in decay of willow.

Damage

Young trees are usually free from decay. Incidence of decay increases with advancing age of trees. Decay fungi are common on dead wood. On live trees, decayed stems are more vulnerable to wind or snow breakage. Live trees are seldom killed by decay fungi, but affected wood is unsuitable for use as wood products.

Control

Little can be done to control stem decays after trees are infected; control measures should be directed toward preventing infection. Wounds close faster, and more effective defense barriers are formed on vigorous trees. Maintain tree vigor by applying water and fertilizer if possible. Prevent mechanical wounds and avoid wo caused by fires. If wounds occur, prune to pro callusing. If branches break, prune back to the ne living lateral. If a main stem is wounded, shape wound into an ellipse to promote closing by c formation.

If thinning is feasible, remove the least vigorous and trees that are already or most likely to becom fected. Do not damage residual trees while thinn Remove dead wood from the site.

Selected References

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Figure 28-2. Hymenia of *D. confragosa*, showing daedaloid (mazelike) pores.

Figure 28-3. Effused-reflexed fruiting bodies of *Trametes trog* toothlike pores.