Tip Dieback Of Young Grand Fir Caused By Cytospora Canker

By Arthur D. Partridge

A dieback of the terminal and upper branches of young grand fir (*Abies grandis* (Dougl.) Lindl.), noticed on cultured and natural trees in localized areas of northern Idaho, poses a serious problem to producers of Christmas trees. The disease badly distorts and may kill individual trees rendering them valueless. It is particularly serious in Christmas trees because the pruning done to improve form may favor its invasion and accelerate its spread. The causal fungus (*Valsa abietis Fr. = Cytospora abietis* Sacc.) invades wounds and is easily carried by pruning tools or by the hands that use them.

The disease usually is noticed first as a browning of the needles on individual leaders. This progresses downward for six inches or at the most two feet per year. No other external symptoms are clearly visible. Ordinarily, no identifying fungal structures are produced until two- or three-year-old stems are invaded. Then, tiny, black, pear-shaped, "pimple-like" structures develop beneath the outer bark and protrude slightly. These are hidden by the rough bark, but are easily seen as round black patches when the outer bark is lightly shaven with a knife (Fig. 1.) During moist weather, spores ooze from these structures and are seen as yellow or orange, hair-like tendrils protruding from the bark (Fig. 2.) The limit of each canker or dead area usually is not easy to find, but can be detected by slicing off the outer bark beginning in obviously dead tissue and proceeding down the stem. At the interface, brown bark suddenly joins living, green bark (Fig. 3.)

Ordinarily, this disease affects only a few trees and naturally subsides without treatment, but occasionally individual stands or trees may be severely damaged and some trees progressively

killed. Thus, if this condition is common in a stand, observe the rate of dieback before deciding to attempt control. If the frequency and rate of invasion decline during several months, do not attempt control. Recovery probably will take place naturally. Remember, control procedures cost money. Unless you can justify such cost in terms of future value, you cannot afford to repress minor losses. If decline continues, and particularly if it continues rapidly in many trees, infected parts or even trees should be removed. In any case, pruning for form should be postponed until natural or artificial control is achieved, because the disease organism easily is carried from one tree to another on pruning tools.

If immediate control is necessary, all dead and dying branches must be pruned out not less than six inches beyond the last vestige of each canker (i.e. beyond the dead/live interface.) The tools used in pruning must be sterilized after each cut to assure that the fungus will not be carried to healthy tissues. A few seconds dip in alcohol, sodium-hypochlorite, or mercuric chloride will suffice. Sodium hypochlorite is harmful to eyes, hands and clothing; mercuric chloride is a potent poison. Handle these chemicals with great care. Pruning should be done only during sunny, dry weather because the fungus reproduces in moisture and spreads rapidly during wet weather.

There is no satisfactory method of chemical control for this disease in forests or plantations. It cannot be "sprayed away" and money spent for this purpose presently is wasted.

If you have this disease in your trees, don't be hasty. Wait to see how it progresses. Cease pruning. If necessary, and only if surely so, prune out dead and dying branches.
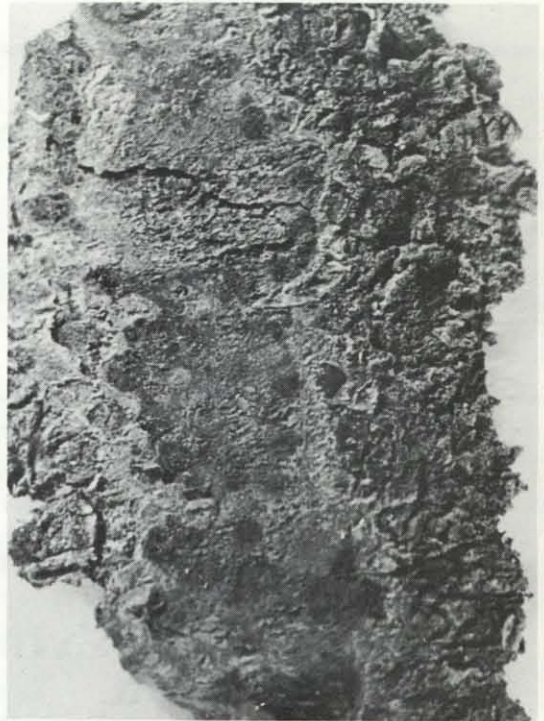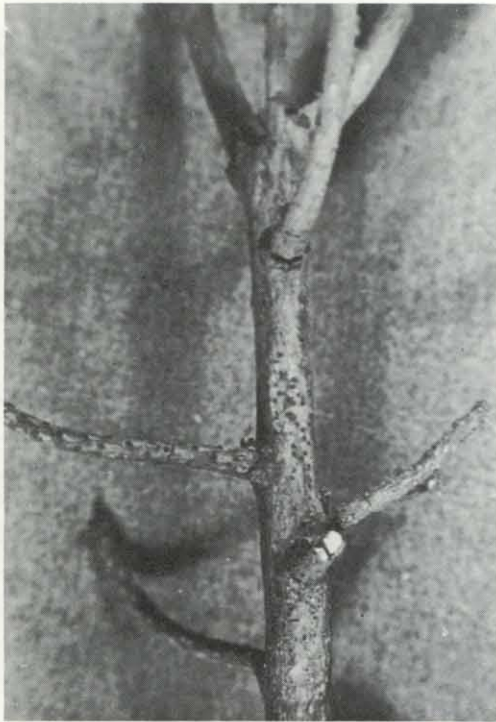
Figure 1. Fungal structures (pycnidia) of the causal organism: Left, as they appear on an infected stem; Right, as exposed by lightly shaving the bark over a canker. (Approximately natural size left; and 30X right).
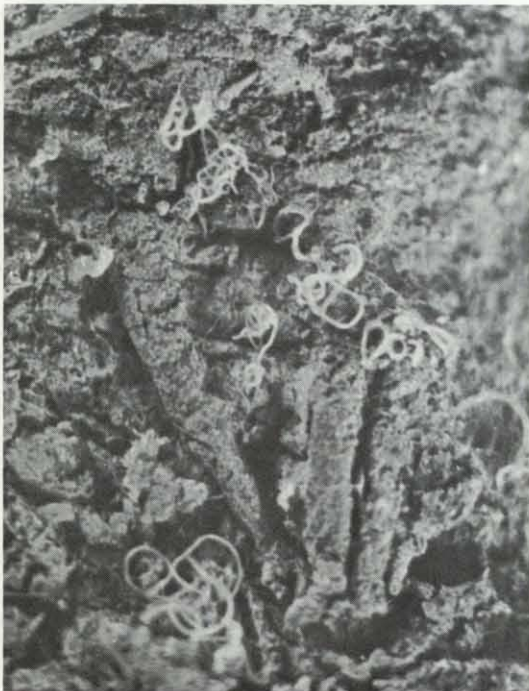

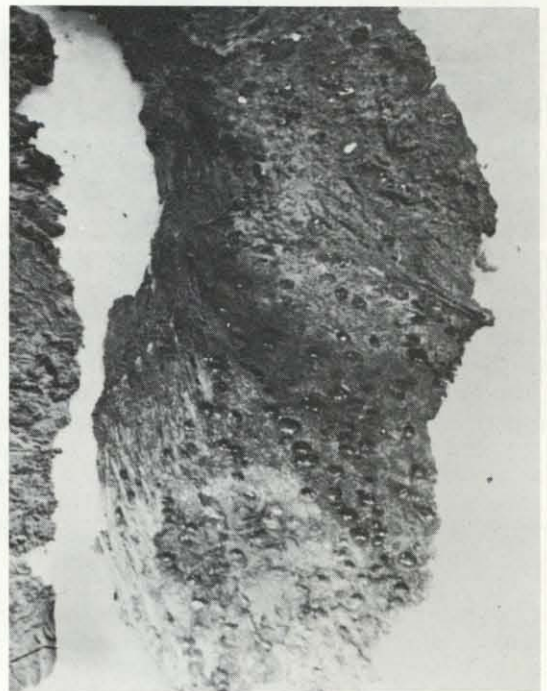Figure 2. Tendrils protruding from pycnidia during moist weather. (Approximately 40X).

Figure 3. Canker limit as indicated by a brown-green line in shaved bark. (Approximately 3X).