PHOMA TIP BLIGHT OF BAREROOT LODGEPOLE PINE SEEDLINGS, CHAMPION TIMBERLANDS NURSERY, PLAINS, MONTANA

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Tip blight of bareroot pine seedlings is a common disorder at several nurseries in the northern Rocky Mountains. Blight symptoms are usually not extensive, but often occur randomly throughout seedbeds. Tip blight was located on several lodgepole pine (*Pinus contorta* Dougl.) seedlings in the spring of their second growing season at the Champion Timberlands Nursery in Plains, Montana. Affected seedlings displayed typical necrosis of upper foliage and stem tissues (fig. 1), whereas lower foliage and root tissues appeared healthy. Several blighted seedlings were taken to the laboratory for analysis. Necrotic tissues were washed thoroughly under running tap water for a few minutes and then placed in moist chambers for 5 days at 22 degrees C. Fungi sporulating on necrotic tissues were examined under the microscope (100-450X) and identified.

Pycnidia were abundantly produced on necrotic needles and were especially concentrated on fasicle sheaths at the base of needles. Epiphytic growth of an olivaceous-brown mycelium was also common over the necrotic needles. Microscopic examination of the pycnidia revealed that they were from the genus *Phoma*. Other fungi commonly sporulating on necrotic needles included *Botrytis cinerea* Pers. ex Fr., *Alternaria alternata* (Fr.) Keissler, and *Epicoccum* spp.

Much of the epiphytic mycelium on necrotic needles contained multi-celled, pigmented structures termed dictyochlamydospores. These were often formed singly (fig. 2) and usually at the terminal end of hyphal strands. These dictyochlamydospores were likely associated with the pycnidia and would indicate that the *Phoma* species associated with tip blight symptoms was in the sub-group *Peyronnellaea* (James and Hamm 1985). Based on the structure of the dictyochlamydospores, the species is tentatively identified as *P. pomorum* Thum. This species has been considered slightly pathogenic on several crops (James and Hamm 1985), but stem inoculations with this species on Douglas-fir seedlings failed to cause disease symptoms (Hamm, unpublished). Therefore, its pathogenic potential in causing tip blight symptoms of bareroot pine seedlings remains unknown.

Tip blight symptoms similar to those reported at the Champion Timberlands Nursery have been found previously at this and other nurseries. Three groups of organisms have been associated with these types of symptoms. These include *Sirococcus strobilinus* Preuss, *Sphaeropsis sapinea* (Fr.) Dyko & Sutton (=*Diplodia pinea* (Desm.) Kickx.),

and *Phoma* spp. Unfortunately, all three types of organisms produce pycnidia that superficially look very similar; the only way to differentiate them is by microscopic examination of their spores. *Sirococcus* has been located on pine seedlings at the Champion Timberlands Nursery (James 1986) and the USDA Forest Service Nursery in Coeur d'Alene, Idaho (James 1985b). Diplodia tip blight is a common problem at the Fantasy Farms Nursery in Peck, Idaho (James 1984a; James 1984c) and is found occasionally at the Forest Service Nursery in Coeur d'Alene (James 1985a). Phoma blight has been located at several nurseries in the northern Rocky Mountains (James and Hamm 1985), but has caused severe disease problems only on Mugo pine at the Fantasy Farms Nursery (James 1984b).

Phoma spp. are common soil inhabitants (James and Hamm 1985) and are usually controlled by fumigation of nursery soil prior to sowing. These organisms have yet to display a capacity to incite serious diseases over a prolonged period of time in northern Rocky Mountain nurseries. Disease incidence is usually not severe enough to warrant specific control measures. Such was the situation on bareroot lodgepole pine seedlings at the Champion Timberlands Nursery.

Figure 1. Tip blight symptoms of bareroot lodgepole pine seedlings at the Champion Timberlands Nursery, Plains, Montana. Necrotic tissues were restricted to the tips of affected seedlings.

Figure 2. Dictyochlamydospores of *Phoma pomorum* associated with tip blight of bareroot lodgepole pine seedlings at the Champion Timberlands Nursery, Plains, Montana (450X).

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