Factors affecting the spread of Swiss needle cast of Douglas-fir in the Pacific Northwest

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Swiss needle cast of Douglas-fir is characterized by symptoms of chlorosis, premature needle abscission, and growth loss. The disease, caused by the ascomycete fungus Phaeocryptopus gaeumannii, is endemic to the Pacific Northwest and widely distributed throughout its host's natural range. P. gaeumannii is only known to infect Douglas-fir, and although it often causes few detrimental effects, high levels of colonization result in disease. Since about 1990 an epidemic of increasing severity has been observed in coastal forests and plantations in Oregon and Washington. In western Oregon Douglas-fir plantations, volume growth losses due to Swiss needle cast are estimated to range from 23% in moderately diseased stands to over 52% in severely diseased stands, affecting about 150,000 hectares. In Cascade Range stands, P. gaeumannii distribution is highly variable; young stands with infection levels approaching those of coastal stands have been found adjacent to mature and old-growth stands having little infection. Variation in fungal colonization and disease severity is strongly correlated with winter temperature and spring moisture for western Oregon sites, suggesting a connection between site microclimate, regional climate trends, and disease.

Descriptors: Article Subject Terms Abscission | Chlorosis | Climate | Colonization | Epidemics | Forests | Infection | Microclimate | Needlecast | Plantations | Temperature effects | **Article Taxonomic Terms** Ascomycetes