Salt-stressed roots were still more severely diseased. MacDonald hypothesized that salt interfered with normal host-plant defense mechanisms. Histopathological studies of stressed and nonstressed roots at intervals after inoculation showed that mycelium of *P. cryptogea* ramified through stressed roots much faster and to a greater extent than through nonstressed roots.

Apparently, saline-induced predisposition to *Pythophthora* root rot involves: 1) a significant increase in the number of zoospores that encyst on roots, resulting in numerous points of infection, and 2) a physiologic change in stressed root tissues that allows a rapid, spreading invasion by the pathogen. These two factors combined could result in severe disease problems when ornamental plants are cultivated in the presence of excess salinity owing to heavy use of fertilizers or other soil amendments, poor-quality irrigation water, or inadequate leaching of soils.

G. A. Chastagner, R. S. Byther, and E. Michaels of the Western Washington Research and Extension Center, Washington State University, Puyallup, have updated an earlier report on *Swiss needle cast disease of Christmas trees* in the Pacific Northwest. During 1981, they found that 84% of 2,650 Douglas-fir Christmas trees examined in western Washington and Oregon were infected with *Phaeocryptopus gaumnini*, the causal agent of Swiss needle cast. At harvest, the infected trees generally retained only 2–3 years of needles. Older, symptomless needles often were infected, and their postharvest retention time on the tree was significantly reduced.

Controlling Swiss needle cast during the three years before harvest increases retention of needles at harvest and improves postharvest quality of Douglas-fir Christmas trees. Chlorothalonil, benomyl, and mancozeb effectively control the disease when applied during shoot extension in the spring. The effectiveness of helicopter applications of chlorothalonil was compared with that of backpack mist-blower applications of the fungicide in four plantings in western Washington during 1981 and 1982. Swiss needle cast was effectively controlled by a single application on 4 or 5 June of chlorothalonil at 8 pt/A by helicopter or two applications at 4 or 8 pt/A by mist blower. Control was less with 4 pt/A than with 8 pt/A applied by helicopter, particularly on needles in the middle or lower portions of the tree. Thus, application by helicopter required higher rates of chlorothalonil for uniform control than applications by backpack mist blower. Nevertheless, helicopter applications provide a rapid and convenient means of controlling Swiss needle cast.

The effects of *emissions from large coal-burning power plants* were nil on natural vegetation and Christmas tree plantings in western Pennsylvania, according to F. A. Wood (now dean of agriculture at the University of Florida, Gainesville) and a team of co-workers from Pennsylvania. The demand for electricity rose rapidly during the 1950s and 1960s, and large power plants were constructed in rural areas, often at the site of a coal mine, to meet this demand at the lowest cost. Preconstruction data were collected around the sites of several plants for three years (1964–1967) to provide a baseline for comparing air quality after the plants were built and emissions began. Natural vegetation is mostly mixed oak with some northern hardwoods, and the only common native conifer species are eastern white pine and eastern hemlock. Christmas trees are a major crop; however, Scotch pine is the dominant species grown, and production is increasing rapidly.

From 1964 to 1981, sulfur levels were monitored and growth patterns of trees were analyzed. Sulfur dioxide (*SO₂*) injury was observed in the vicinity of existing sources of the pollutant (other than power plants), such as culm piles and coke ovens. *SO₂* symptoms were observed at two of the three large power plants after they began operation, but injury was insignificant and was far exceeded by wind damage. In contrast, ozone (*O₃*) injury was common, widespread, and often severe, even before power plants began operation. The combination of *O₃* and *SO₂* caused chlorotic dwarf of eastern white pine and possibly some damage to Austrian and Scotch pines. The most significant problems confronting Christmas tree producers were not from air pollutants, however, but from needle cast diseases caused by *Lophodermium* and *Naemacyclus*. Ambient air monitoring indicated that *SO₂* standards were rarely exceeded but that those for *O₃* were exceeded much more often. The widespread *O₃* symptoms observed during both the preoperation and postoperation phases of the study were not associated with distance and direction from the power plants. Such *O₃* injury is now common throughout the Northeast; the ozone or prezone compounds apparently originate in metropolitan centers and are transported to remote rural areas.