

Abstract

The objectives of this study were: (1) to determine the etiology of bull's eye rot on pears grown in Oregon and Washington; (2) to determine periods of greatest susceptibility of pear wood to canker formation by the fungal pathogens *Neofabraea alba* and *N. perennans*; (3) to monitor conidial production in cankers; (4) to determine the timing of fruit infection; and (5) to determine the effect of environmental factors, cultural practices and chemical treatments on the development of bull's eye rot of pears. *N. alba*, *N. perennans* and *N. sp. nova* were identified in isolates obtained from bull's eye rot on pear fruit, using species-specific primers in a PCR reaction. *N. alba* was also found to be associated with naturally occurring small cankers and pruning stubs on pear trees. Pear trees were inoculated at monthly intervals with mycelia of *N. alba* and *N. perennans* to determine susceptibility to canker formation. Susceptibility was highest during autumn and winter months, with larger cankers bearing conspicuous acervuli produced after inoculations from October to February. Small cankers resulted from conidial inoculations with *N. perennans* on superficially wounded pear branches. Cankers induced after mycelial inoculations sporulated throughout the year with highest amounts of conidia produced from September to December. Pear fruit became naturally infected throughout the growing season, with increasing infection levels close to harvest. Contradictory effects of temperature on bull's eye rot development by *N. perennans* were observed between 2001 and 2002, where the highest levels of disease were found at 10°C and at 30°C, respectively. Wetness duration did not affect bull's eye rot development, while the concentration of conidia correlated positively with disease development. Over-tree irrigation and late harvest resulted in higher disease levels than under-tree irrigation and early to mid season harvest. The fungicides trifloxystrobin and ziram protected inoculated fruit for about one month, while copper sulfate reduced the sporulation rate of cankers induced by *N. alba*. Thiabendazole applied as a postharvest dip reduced bull's eye rot on inoculated pears.