

EFFECTS OF FUEL REDUCTION TREATMENTS ON  
THE INCIDENCE OF TWO ROOT PATHOGENS  
OF FOREST TREES

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by

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## ABSTRACT

A major problem with forests in the United States is the presence of excessive quantities of combustible fuels that are allowed to accumulate due to the fire suppression activities of humans. Excess fuels can increase fire severity and intensity and lead to uncontrollable wildfires. Consequently, the National Fire and Fire Surrogate study was initiated to study the impacts of fuel reduction treatments on forest ecosystems at 13 sites across the United States—including two sites in the Carolinas. This study represents the plant pathology component in the Carolinas of the larger national study. The fuel reduction treatments used were: prescribed burning with periodic re-burns, mechanical fuel reduction (thinning or chainsaw felling of shrubs), mechanical fuel reduction followed by prescribed fire, and a non-treated control. The study areas for this project were located in the Clemson Experimental Forest in the Piedmont of South Carolina and on the Green River Game Land in southwestern North Carolina, in the southern Appalachian Mountains. The objectives of this study were to estimate incidences of two root pathogens, *Leptographium* spp. and *Phytophthora* spp., before and after fuel reduction treatments and to determine the effects of these treatments on pathogen incidence. In the Clemson Experimental Forest, both *L. procerum* and *L. terebrantis* were recovered from roots of pine trees. Fuel reduction treatments reduced incidence of *Leptographium* spp. while incidence in control plots remained unchanged; however, these decreases could not be attributed solely to fuel reduction treatments because of other compromising

factors at this site. At the Green River Game Land site, two species of *Phytophthora* were recovered; *P. cinnamomi* occurred in 100% and *P. heveae* occurred in 25% of the plots before treatment. Incidences of these pathogens were not affected by fuel reduction treatments. The pathogenic potential of representative forest isolates of *Phytophthora* spp. was investigated. *P. heveae* was weakly pathogenic—causing lesions only on wounded mountain laurel and rhododendron leaves under laboratory conditions. *P. cinnamomi* was pathogenic—causing root rot that resulted in mortality on both mountain laurel and white pines under conducive conditions in the greenhouse.

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## DEDICATION

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