

Abstract

More than 25,000 2-0 Douglas-fir seedlings were planted around stumps of recently harvested Douglas-fir and coast redwood. The Douglas-fir stumps had previously been graded from non-infected to light-through heavy black stain root disease infection levels.

Seedling infection levels were highest around Douglas-fir stumps having light to heavy infection levels, while infection levels were lowest around apparently uninfected Douglas-fir and redwood stumps. There was no difference in level of seedling infection between the clearcut and the selection cut test areas.

INTRODUCTION

Verticicladiella wagneri Kendr., the cause of black stain root disease, (BSRD), was first reported as a pathogen on Douglas-fir, in 1967 (3). Since that time, the fungus has been reported with increasing frequency in Douglas-fir throughout most of the range of the host (2,5,8,12,14). The increased incidence of the disease in Douglas-fir may be related to greater awareness and detection or to an increase in plantation management and stand disturbances (6,7,8,9), or both. In either case, the level of infection in Douglas-fir along the northern coast of California is cause for concern (13).

To date, most of the published research reports have dealt with the disease in pine, which is caused by a variant of V. wagneri that may differ in several respects from that which infects Douglas-fir (8). As a result, relatively little is known about the biology/epidemiology of the fungus in Douglas-fir, and even less can be said about its control. Hylastes nigrinus, a root-feeding bark beetle, is probably the major aerial vector of the fungus. V. wagneri apparently has little capacity to move through soil to cause infection of unwounded roots of Douglas-fir (11,16), although the variant in pine may do so (10).

Some of the more pertinent questions needing study include the following: can the fungus infect outplanted seedlings around stumps of trees that were infected prior to harvest; if so, how long can the fungus persist to infect outplanted seedlings; can the fungus persist in infected roots and seedlings to spread and infect the Douglas-firs as they grow into saplings and larger trees; and can differences in silvicultural harvesting methods influence the incidence of infection of the seedlings? The current studies reported herein were designed to provide information in these areas.