SOIL ASSAYS FOR *FUSARIUM* AND *PYTHIUM* IN FUMIGATED SOILS AT THE USDA FOREST SERVICE NURSERY, COEUR D'ALENE, IDAHO

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ABSTRACT

Soil dilution assays for populations of *Pythium* and *Fusarium* spp. were conducted during April 1985 for two fumigated sites at the USDA Forest Service Nursery, Coeur d'Alene, Idaho. *Pythium* spp. were not recovered from any samples. *Fusarium* spp. were recovered at very low levels ($\bar{X}$ = 32 ppg) in samples from a site fumigated in August 1983 and left fallow during 1984. Pathogen levels were probably not high enough to cause significant disease if this site is used for bareroot seedling production during 1985.

INTRODUCTION

Fumigation of soil with methyl bromide/chloropicrin is a standard practice prior to sowing seedbeds for bareroot seedling production at the USDA Forest Service Nursery in Coeur d'Alene, Idaho. Normally, soil fumigation is conducted in late summer or early fall followed by sowing the following spring. However, one area (designated Area A) in the southern part of the nursery was fumigated during August 1983 and left fallow during 1984 with an expected sowing in the spring of 1985. Because of reduced bareroot seedling production anticipated for 1985, Area A may not be needed. Therefore, growers requested that soil assays be conducted for common pathogens to evaluate if this area could be used to successfully grow seedlings if needed. Soil pathogen populations were compared with those in another area (Area B) which was fumigated during August 1984 and will be sown in the spring of 1985.

MATERIALS AND METHODS

Ten soil samples were collected from each area during March 1985. All soil samples consisted of three 40-80 g collections using a soil-sampling tube (2 cm diameter) at about 0.5 m intervals in the center of each sampling block and mixed together. Sampling blocks in Area A were located on a north-south transect through the area; samples 1-5 were about 12 m west of a road and samples 6-10 were about 12 m west of and parallel with samples 1-5. Samples were collected at about 15 m intervals along the transect. Samples in Area B were collected in seedbed blocks 23-27 along a north-south transect. Samples 1-5 were in blocks 27-23, respectively and located about 12 m east of a road; samples 6-10 were in blocks 23-27, respectively, and located about 12 m farther east and parallel with samples 1-5.

Soil dilutions of 1:2 were made in 0.5% water agar (WA) and 1 ml dispensed onto plates of selective media for *Pythium* (Hendrix and Kuhlman 1965). Plates were incubated in the dark at about 24°C for 5 days after which they were checked for *Pythium* colonies. For determining *Fusarium* populations, soil dilutions of 1:400 were made in 0.1 percent WA and 1 ml dispensed onto plates of selective media for *Fusarium* (Komada 1975). Plates were incubated under cool, fluorescent light for 5 days at about 22-24°C, after which *Fusarium* colonies were counted. *Pythium* and *Fusarium* populations were calculated as propagules per gm (ppg) of soil on the basis of each propagule giving rise to one fungal colony.

RESULTS AND DISCUSSION

None of the soil samples collected from either area yielded colonies of Pythium spp. Fusarium was not found in Area B (fumigated in 1984) and populations in Area A (fumigated in 1983) were very low (averaged 32 ppg; 4 of 10 soil samples yielded some Fusarium). Generally, populations of saprophytic fungi, particularly Trichoderma, were much higher in Area A, indicating reinvasion and colonization during the 1984 fallow period. The low Fusarium levels in Area A indicated that reinvasion apparently had been slow for this fungus and populations were insufficient to warrant concern about potential root diseases if this area is used for production in 1985. The major species of Fusarium assayed was F. oxysporum Schlect.; however, it is unknown if pathogenic isolates of the fungus were recovered.

CONCLUSIONS

1. Both Areas A and B can probably be used for production in 1985 with little chance for significant losses from diseases caused by soil pathogens.

2. Fusarium reinvasion of fumigated soil at the Nursery did occur, but at such low levels that sites could be used for bareroot seedling production even 1.5 years after fumigation.

3. Pythium was not recovered from assayed soil; no reinvasion of fumigated soil by this fungus was detected.

LITERATURE CITED

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