PYTHIUM ROOT ROT OF BLACK WALNUT FOUND IN LOUISIANA

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There are few growers of black walnut (*Juglans nigra* L.) in Louisiana. Mr. O. E. Williams, Jr., owns a 8.09 ha black walnut outplanting and a small nursery near Many, La. A possible black walnut root rot problem on his property was brought to the attention of the Soil Conservation Service in Sabine Parish, and in November 1977, the walnut outplanting was examined by the authors.

The soil-borne fungi, *Phytophthora* spp. and *Pythium* spp., cause closely related damping-off and root rot disease problems in forest tree nurseries. A *Phytophthora* sp. was reported as the causal agent of a root rot of black walnut seedlings in an Indiana nursery (*4*). Personal communications with Dr. Roger Sauve of the Tennessee Department of Agriculture, Dr. Ed Cordell of the Forest Service, and Bruce Kauffman of the Tennessee Division of Forestry indicated that the causal agents of a root rot of white pine seedlings at a Tennessee State forest tree nursery were *Pythium* spp. These fungi, as well as *Cylindrocladium* spp., were suspected as possible causes for the root rot problem observed in the Williams walnut outplanting and nursery seedbed. Cylindrocladium spp. have caused severe damage to 1-0 black walnut seedlings in several widespread southern nursery locations during the past decade (*2, 3*).

Methods

Six 1-year-old seedlings (2 years from seeding) were observed with root rot symptoms in the outplanting. However, the advanced stage of root rot symptoms observed precluded taking samples.

In addition, Mr. Williams pointed out that when the seedlings were transplanted from the nursery seedbed to the outplanting, a considerable amount of soil was often attached to the roots. Therefore, it was suspected that the root rot problem could have originated in the nursery seedbed.

Seedlings with similar root rot symptoms were also observed in the nursery (fig. 1). A half dozen seedlings from the nursery, along with soil samples, were obtained for laboratory diagnosis.

Initially, soil and seedling samples were analyzed specifically for *Cylindrocladium* spp. Tissue isolations were made from both walnut and alfalfa roots. The alfalfa plants were used as a selective soil bioassay trapping mechanism.

Soil samples were also sent to the Mycorrhizal Institute for Research and Development in Athens, Ga., for biological analyses

Figure 1.—*Pythium root rot symptoms on 1-0 black walnut seedlings observed in nursery in Sabine Parish, La.*

of *Pythium* spp. and *Phytophthora* spp. A selective fungus medium for the isolation of *Pythium* and *Phytophthora* was used in these analyses.

Results

Cylindrocladium spp. were not detected in either symptomatic walnut seedling roots or soil (alfalfa trap) samples.

Biological analyses of the soil on the selective *Pythium* and *Phytophthora* isolation medium (modified Kerr's medium) yielded an average of 81 colonies of *Pythium* spp. per gram of soil—one species apparently being *P. irregulare.* This *Pythium* spp. inoculum level is probably sufficient to cause a root rot disease problem on the black walnut seedlings (personal communication with Don Marx, Mycorrhizal Institute for Research and Development, Athens, Ga.).

Discussion

The *Pythium* spp. were most likely transmitted to the walnut outplanting by the soil movement on seedlings obtained from the nursery seedbed. This is apparently the first report of Pythium root rot on black walnut in Louisiana (*5*).

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