64. Root Lesion Nematodes in Junipers and Pines

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A survey in Great Plains tree nurseries in 1960 revealed that conifer seedlings were more commonly damaged by root lesion nematodes than by any other group of nematodes.

Hosts and Distribution

The root lesion nematode encountered most frequently in the 1960 survey was *Pratylenchus penetrans*. This nematode was found in the roots of seedlings in central and eastern Nebraska nurseries.

P. penetrans has a wide host range, which includes field crops as well as trees. In central Nebraska, this nematode was found in roots of eastern redcedar, Rocky Mountain juniper, white spruce, blue spruce, Austrian pine, and ponderosa pine.

Symptoms and Signs

Reduced growth of seedlings is the most obvious symptom in nurseries (fig. 64–1). See Article 49 for general symptoms on infected seedlings. Commonly, stunted seedlings are in irregular patches. When nursery soil infested with root lesion nematodes is fumigated, there are occasional areas where fumigation is not complete (due to misses or torn plastic sheets); infected, low vigor seedlings can often be found in these areas (fig. 64–2).

Infected seedlings that are stunted have a reduced root system, and usually develop new, fleshy roots in response to the depleted root system. These fleshy roots are lighter colored and larger in diameter than adjacent older roots. A check for the presence of root lesion nematodes by standard extraction procedures is best done on these fleshy roots.

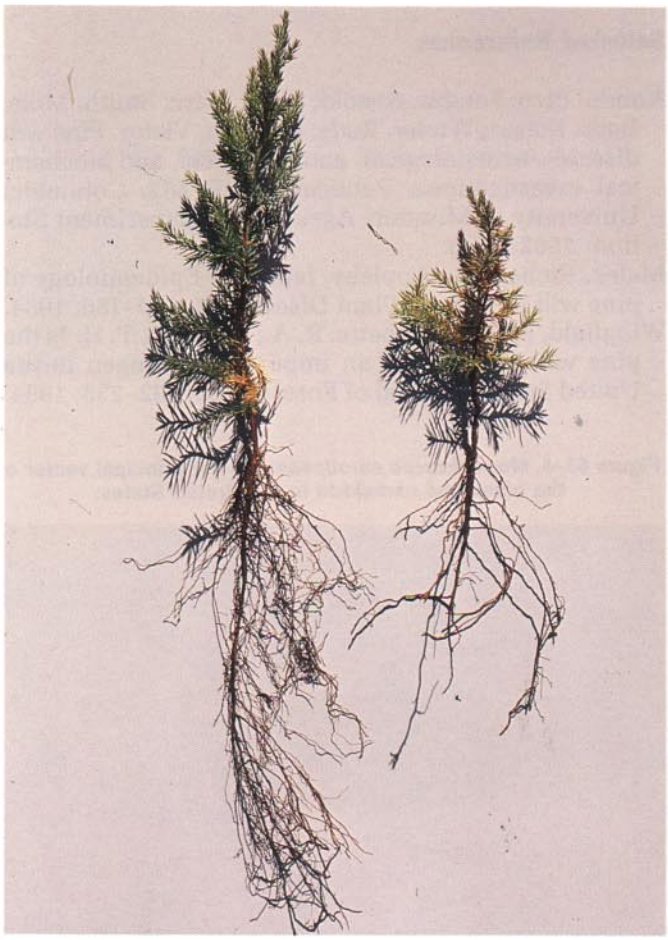

Figure 64–1. Eastern redcedar damaged by root lesion nematodes; left is non-infected, right is infected.

Figure 64–2. Damage to eastern redcedar seedlings where soil fumigation not complete.

Figure 64–3. Damage to an oat cover crop in a nursery block infested with root lesion nematodes; healthy oats in non-infested area (background).

Figure 64–4. Eastern redcedar seedling damage in beds adjacent to windbreak of eastern redcedar infected with root lesion nematodes.

Older, established trees that are growing in soil infested with root lesion nematodes may not show external evidence of infection, even though their roots are infected.

Disease Cycle

Root lesion nematodes are soil borne. They enter and complete a part of their life cycle inside feeder roots. They persist in the soil, where they overwinter even in northern nurseries. Thus the source of infection is nematodes present in the soil when seedlings are established. Nematode populations can increase on some cover crops (fig. 64–3).

Damage

Root lesion nematodes feed and move within roots, thereby damaging roots and reducing the growth of seedlings. Established pines, junipers, and spruce in nursery windbreaks, landscapes, and field plantings are also subject to infection, but damage is not obvious. In a central Nebraska nursery root lesion nematodes were numerous in soil beneath eastern redcedar windbreaks. Although damage to windbreak trees was not obvious; there was extensive damage to seedlings in adjacent nursery beds (fig. 64–4).

Control

Damage by root lesion nematodes can be reduced by treating nursery soil with fumigants such as methyl bromide (fig. 64–5). Fumigation drastically reduces the population of nematodes, but it does not completely eradicate them from the soil. Seedlings in the central Great Plains can be grown in fumigated soil for 2 years without significant damage, but third-year seedlings are likely to be severely damaged.

In nurseries, damage from root lesion nematodes can be reduced by soil fumigation, by use of cover crops that are resistant, and by use of non-susceptible trees in nursery windbreaks.

Selected References

Dunn, R. A.; Mai, W. F. Reproduction of *Pratylenchus penetrans* in roots of seven cover crop species in greenhouse experiments. Plant Disease Reporter. 57: 728–730; 1973.

Peterson, Glenn W. Response of ponderosa pine seedlings to soil fumigants. Plant Disease Reporter. 54: 572–575; 1970.

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Figure 64–5. Control of root lesion nematodes by fumigation of soil with methyl bromide.