

INFLUENCE OF SIX COVER CROPS ON POPULATION DENSITY OF PRATYLENCHUS PENETRANS¹

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To control *Pratylenchus penetrans* (Cobb, 1917) in orchards, it is often necessary to use a pre-plant integrated program, including soil fumigants and fallowing or suitable cover crops, Parker et al. (3) stated that it generally takes two years after removing old trees before orchard soils are suitable for replanting. MacDonald and Mai (2) found that Sudan grass was the most suitable cover crop for use in integrated programs to control *P. penetrans* in orchard soils. Bird (1) published a control program for combating orchard replant problems in southwestern Ontario.

The following experiment was used to evaluate the influence of six cover crops on an Ontario population of *P. penetrans*. Ten seeds of a cover crop (Table 1) were planted in each of eight 3-inch clay pots of sandy loam infested at the rate of three *P. penetrans*/5 g of soil. Similar groups of pots were seeded with five other cover crops. The pots were buried to the soil level in sand in plastic containers and submerged to the soil level in constant-temperature water baths. They were germinated and grown at a soil temperature of 25° C. Sixty days after seeding, nematodes were extracted from the roots with a modified Baermann funnel. Quantitative population estimates (Table 1) were made by adjusting the sample to a known volume and counting the number of *P. penetrans* in five 1-ml aliquots.

Population densities of *P. penetrans* in roots of Sudan grass and rye grass were less than those of MacDonald and Mai (2). Of the plants tested, Sudan grass and rye grass appear to be the best cover crops for use in programs for combating orchard replant problems. Orchard sites to be replanted, should remain fallow or in a suitable cover crop during the growing season preceding soil fumigation. This allows time for living tree roots to de-

compose and nematodes to migrate out of the roots upward, where they can be controlled with soil fumigants. Fallowing will reduce populations of *P. penetrans* more than cover crops, but fallowing is often not practical because of soil erosion problems.

Table 1. *Pratylenchus penetrans* recovered from the roots of six cover crops

Cover crop	Mean ^{***} number/g root
Sudan grass (<i>Sorghum vulgare</i> var. <i>sudanense</i> Hitchc.)	4.2 a
Rye grass (<i>Lolium perenne</i> L.)	6.2 a
Sudax (Sudan grass x sorghum hybrid)	7.1 a
Orchard grass (<i>Dactylis glomerata</i> L.)	12.5 a
Alfalfa (<i>Medicago sativa</i> L.)	48.8 b
Hairy vetch (<i>Vicia sativa</i> L.)	52.8 b

* Means followed by different letters are significantly different at the 5% level of probability (Duncan's Multiple Range Test).

Literature cited

- Bird, G.W. 1968. Orchard replant problems. Canada Dept. Agr. Pub. (In press)
- MacDonald, D.H. and W.F. Mai. 1963. Suitability of various cover crops as hosts for the lesion nematode *Pratylenchus penetrans*. *Phytopathology* 53:730-731.
- Parker, K.G., W.F. Mai, G.H. Oberly, K.D. Brase, and K.D. Hickey. 1966. Combating replant problems in orchards. *Cornell Univ. Ext. Bull.* 1966. 19 p.

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