Reproduction and Survival of *Xiphinema americanum* on Selected Woody Plants, Crops, and Weeds

P. M. MILLER, Department of Plant Pathology, Connecticut Agricultural Experiment Station, New Haven 06504

ABSTRACT

MILLER, P. M. 1980. Reproduction and survival of *Xiphinema americanum* on selected woody plants, crops, and weeds. Plant Disease 64:174-175.

Populations of *Xiphinema americanum* on 37 plants in more than 40 weeds, woody plants, and crops were measured after 59, 118, and 169 days in the greenhouse. The populations of nematodes after 6 mo were highest on cinquefoil (*Potentilla canadensis*) followed in order by chicory (*Cichorium intybus*) and dandelion (*Taraxacum officinale*). Populations were moderate on apple (*Malus sylvestris*), but cucurbits, ragweed (*Ambrosia artemisiifolia*), and fleabane (*Erigeron annuus*) were poor hosts. Nematode populations disappeared after 118 days on nine other hosts.

The ability of plants in 37 species to support reproduction and survival of *Xiphinema americanum* Cobb was examined. This is an injurious nematode that can transmit viruses (9), but cultures of this nematode are difficult to maintain in the greenhouse. Dandelion (*Taraxacum officinale* Weber) is used by W. F. Mai (*personal communication*) to maintain cultures of *X. americanum*. The purpose of this investigation was to find hosts suitable for maintaining a population of these nematodes in the greenhouse for experimental purposes.

Accepted for publication 26 September 1979.

00191-2917/80/000034$03.00/0

MATERIAL AND METHODS

Each potential host plant was grown in a 15-cm plastic pot containing 720 nematodes per kilogram of silt loam. The plastic pots, five per host, were buried in a nematode-free sand within 1 cm of the top, to reduce drying. In some trials, seedlings were transplanted from autoclaved soil; in other trials, seeds were sown directly into pots of soil. Weeds and woody plant seedlings were taken outdoors, washed until the wash water was free from nematodes, and planted.

Plants were grown in the greenhouse at 22 ± 3 C. Short-lived vegetables were reseeded after 9 wk. After 59, 118, and 169 days, 50-g soil samples were taken for nematode assay, and nematodes were extracted by flotation (6).

RESULTS AND DISCUSSION

After 118 days in the greenhouse, populations of *X. americanum* were high on cinquefoil, chicory, and lettuce (Table 1). Nematodes did not survive on cucumber, watermelon, oats, corn, sheep sorrel, fleabane, sudan grass, oxalis, or plantains after 169 days.

Table 1. Survival of *Xiphinema americanum* on selected crops, weeds, and woody plants in the greenhouse

Host plant	Number of nematodes per 50 g of soil[a]		
	59 days	118 days	169 days[b]
None (fallow)	42	21	4
Cinquefoil (*Potentilla canadensis*)	42	65	90a
Chicory (*Cichorium intybus*)	72	60	66ab
Dandelion (*Taraxacum officinale*)	36	54	63ab
Red osier dogwood (*Cornus stolonifera*)	28	47	60ab
Fescue grass (*Festuca rubra* 'Chewings')	56	27	60ab
Chickweed (*Stellaria media*)	92	73	54ab
Red oak (*Quercus borealis*)	60	42	50ab
Lettuce (*Lactuca sativa*)	83	84	48 b
Black cherry (*Prunus serotina*)	42	57	47 b
Blackberry (*Rubus allegheniensis*)	75	27	47 b
Sugar maple (*Acer saccharum*)	36	60	45 b
Alfalfa (*Medicago sativa*)	19	22	36 b
Flowering dogwood (*Cornus florida*)	36	57	36 b
Apple (*Malus sylvestris*)	83	75	30 bc
Black oak (*Quercus velutina*)	28	18	28 bc
Orchardgrass (*Dactylis glomerata*)	26	26	26 bc
Tomato (*Lycopersicon esculentum*)	36	28	20 bc
Poison ivy (*Rhus toxicodendron*)	48	16	20 bc
Tobacco (*Nicotiana tobacum* 'WS 117')	22	28	12 c
Ryegrass (*Lolium multiflorum*)	22	38	12 c
Muskmelon (*Cucumis melo* 'Burpee's Hybrid')	12	16	12 c
Crabgrass (*Digitaria glomerata*)	36	27	12 c
Strawberry (*Fragaria chiloensis* 'Anassa')	30	72	12 c
Cabbage (*Brassica oleracea* 'Savoy King Hybrid')	12	0	8 c
Ragweed (*Ambrosia artemisiifolia*)	0	0	4 c
Bentgrass (*Agrostis canina* 'Astoria')	20	12	4 c
Watermelon (*Citrullus vulgaris* 'Dixie Queen Hybrid')	12	24	0 c
Cucumber (*Cucumis sativus*)	6	14	0 c
Oats (*Avena nuda*)	16	57	0 c
Sheep sorrel (*Rumex acetosella*)	16	24	0 c
Fleabane (*Erigeron annuus*)	0	0	0 c
Corn (*Zea mays*)	24	48	0 c
Sudan grass (*Sorghum vulgare* 'Sudanese')	60	36	0 c
Oxalis (*Oxalis corniculata*)	26	4	0 c
Buckhorn plantain (*Plantago lanceolata*)	105	84	0 c
Common plantain (*Plantago major*)	60	21	0 c

[a] Average of five 50 g-soil samples.

[b] Figures in column followed by the same letter are not significantly different from each other (Duncan's multiple range test, $P = 0.05$)

Mai et al (5) reported this nematode to parasitize 103 woody and herbaceous plants that included crops, weeds, trees, and shrubs. Lownsbery (4) found alfalfa, pear, lettuce, grape, peach, almond, strawberry, mazzard cherry, mahaleb cherry, apricot, walnut, corn, and orchard grass to be good hosts but cucmber a poor host. Peach (1), soybean (3), and other plants (2,7,8) are also hosts.

Results reported here generally agree with those in the literature, and several good hosts were identified that are useful in maintaining nematode populations for experimental purposes.

LITERATURE CITED

1. BARKER, K. R., and C. N. CLAYTON. 1973. Nematodes attacking cultivars of peach in North Carolina. J. Nematol. 5:265-271.
2. COHN, E. 1970. Observations on the feeding and symptomatology of *Xiphinema* and *Longidorus* on selected host roots. J. Nematol. 2:167-173.
3. FERRIS, V. R., and R. L. BERNARD. 1971. Effect of soil type on population densities of nematodes in soybean rotation fields. J. Nematol. 3:123-128.
4. LOWNSBERY, B. F. 1964. Effect of cropping on population levels of *Xiphinema americanum* and *Criconemoides xenoplax*. Plant Dis. Rep. 48:218-221.
5. MAI, W. F., H. W. CRITTENDEN, and W. H. JENKINS. 1963. Distribution of stylet-bearing nematodes in the northeastern United States. N. J. Agric. Exp. Stn. Bull. 795. 62 pp.
6. MILLER, P. M. 1957. A method for the quick separation of nematodes from soil samples. Plant Dis. Rep. 41:194.
7. RASKI, D. J., and J. D. RADEWALD. 1958. Reproduction and symptomatology of certain ectoparasitic nematodes on roots of Thompson seedless grape. Plant Dis. Rep. 42:941-943.
8. RUEHLE, J. L., and J. N. SASSER. 1962. The role of plant-parasitic nematodes in stunting of pines in southern plantations. Phytopathology 52:56-68.
9. STAUFFER, R. F. 1977. Tomato ringspot virus graft union necrosis: Is there a link? Am. Fruit Grow. 97:16-31.