

Globodera tabacum, the tobacco cyst nematode

D. E. Stokes

The tobacco cyst nematode, *Globodera tabacum* (Lownsbery and Lownsbery, 1954) Mulvey and Stone, 1976, was described from specimens found parasitizing tobacco, *Nicotiana tabacum* L., in Connecticut (3). *G. tabacum* is related to the golden nematode, *G. rostochiensis* (Wollenweber, 1923) Behrens, 1975; however, these species differ in morphology and host preferences (4). The tobacco cyst nematode is known to be of economic importance to crops grown in Florida (tobacco, tomato, and eggplant); therefore an awareness of this pest is important to Florida agriculture.

ECONOMIC LOSSES

In a greenhouse experiment, a density of 1000 *Globodera tabacum* larvae/g of soil reduced dry weights of tobacco plants receiving normal rates of fertilizer by 25 per cent. Similar losses may occur when tobacco is grown in fields infested with the tobacco cyst nematode. An average of 22% increase in plant height was attained by plants grown in areas receiving preplant treatments of D-D (1, 3-dichloropropene + 1, 2-dichloropropane) (4). Field experiments revealed more than a threefold increase in viable larvae/g soil in one year (4).

Studies on host-plant response at the cellular level to *G. tabacum* indicate the direct host responses to feeding by the nematode was the altering of nuclear activity of host cells. It appeared that the presence of a stimulus produced by *G. tabacum* increased the metabolic activity of nuclei and changed their shape (1).

DISTRIBUTION AND HOST RANGE

Globodera tabacum has a very limited known distribution. It is reported from Hartford and Middlesex counties of Connecticut and also from Hampden and Hampshire counties of Massachusetts (2).

The known hosts of tobacco cyst nematode are limited to members of the family Solanaceae and include: *Lycopersicon esculentum* Mill. (tomato), *Nicotiana rustica* L. (wild tobacco), *N. tabacum* L. (tobacco), *Solanum dulcamara* L. (bittersweet nightshade), *S. integrifolium* Poir. (tomato-fruited eggplant), *S. nigrum* L. (black nightshade), and *S. rostratum* Denal (buffalo-bur) (2).

CONTROL

Chemical control of *Globodera tabacum* in tobacco field experiments was obtained by preplant applications of 45 gal/A of D-D (1, 3-dichloropropene + 1, 2-dichloropropane). Tobacco grown in plots treated with D-D at 45 gal/A produced cured tobacco which was more tender, smoother, and darker than the control, whereas tobacco grown on plots treated with D-D at 90 gal/A was commercially unsuitable due to very poor leaf burn, which is indicative of poor quality, and a

dark veining appearance (4). In greenhouse tests Vydate (methyl N, N-dimethyl-N-[(methylcarbamoyl) oxy]-1-thiooxamimidate) used as a foliar spray at the rate of 2000 ppm gave 95% control of *G. tabacum*. Vydate applied to the soil at 2 lb/A gave 98% control of tobacco cyst nematodes, whereas 6 lb/A gave complete control (5).

SURVEY AND DETECTION

- 1) Hosts of *G. tabacum* which exhibit unthrifty appearance may be suspected of having nematode injury.
- 2) Roots of unthrifty plants should be closely examined with the aid of a 15X-20X hand lens to determine if adult cyst nematodes can be observed attached to roots. Since nematodes are not always detectable with the aid of a hand lens, failure to detect nematodes in the field does not eliminate suspicion of nematode involvement.
- 3) Soil and roots from plants suspected of being infected by the tobacco cyst nematode should be sent directly to the Bureau of Nematology.

LITERATURE CITED

1. Huang, C., and R. A. Rhode. 1970. Studies on the host response to *Heterodera tabacum*. J. Parasitol. 56:161-162.
2. Lapp, N. A. 1980. *Globodera tabacum*. Nematology Newsletter 26:19-20.
3. Lownsbery, B. F., and J. W. Lownsbery. 1954. *Heterodera tabacum* new species, a parasite of solanaceous plants in Connecticut. Proc. Helm. Soc. Wash. 21:42-47.
4. _____, and B. G. Peters. 1955. The relation of the tobacco cyst nematode to tobacco growth. Phytopathology 45:163-167.
5. Miller, P. M. 1972. Controlling *Heterodera tabacum* with sprays and soil treatment with DuPont 1410. Plant Dis. Rep. 56:255.