

Growth Stimulation of *Sporobolus poiretii* by *Aphelenchoides besseyi*

Robert B. Marlatt and V. G. Perry

Plant Pathologist, University of Florida, Sub-Tropical Experiment Station, Homestead 33030, and Nematologist, Department of Entomology and Nematology, Gainesville 32601, respectively.

Florida Journal Series Paper No. 3786 of the Institute of Food and Agricultural Sciences.

The technical assistance of Eva Pryor is gratefully acknowledged.

ABSTRACT

The wild grass, *Sporobolus poiretii*, developed a heavier top weight and produced more inflorescences when infested with a foliar nematode, *Aphelenchoides besseyi*, than did grass with no nematodes. Grass height was not affected significantly. This appears to be the first report of a foliar nematode increasing the growth of a plant. Phytopathology 61:740.

Sporobolus poiretii (Roem. & Schult.) Hitchc. is a common wild grass found in the southeastern United States. The grass is common in pastures, uncultivated roadside areas, groves, and along margins of fields in Florida.

During a search for nematodes in weeds around margins of groves of India rubber plants, *Ficus elastica* 'Decora' Roxb., inflorescences of the grass were often found to contain the foliar nematode, *Aphelenchoides besseyi* Christie (3). Nematodes were not found in grass leaves, but were numerous between the glumes of immature and mature seeds. There were no obvious effects on the glumes, seeds, or plants. An experiment was devised to determine whether the nematodes could affect the grass in an inconspicuous manner.

Grass growing remote from rubber plants was found to be free from foliar nematodes. In March 1970, seeds were collected from such plants and sown in flats, and seedlings were transplanted singly in pasteurized soil in 24 small peat pots. Soil in half the pots was inoculated with washed, chopped leaf lesions of *F. elastica* containing nematodes. Foliar nematodes of *F. elastica* have been shown to be the same as those found on *S. poiretii* (4). The presence of nematodes in *F. elastica* leaves is made obvious by the distinct lesions, whereas infested *S. poiretii* seed heads appear no different macroscopically from seed heads containing no nematodes. Approximately 400 nematodes were added to each pot per inoculation.

After 6 weekly inoculations, plants were transplanted to 1-gal plastic pots, removed from the greenhouse, randomized, and widely spaced in an outdoor nursery. Soil was then inoculated weekly 3 more times.

In August, foliage and seed heads were cut at soil level, and fresh top wt and plant heights were obtained. Mature seed heads from inoculated and noninoculated grass were wrapped in "Scott" facial tissues; Baermann funnel extractions for 48 hr showed nematodes only in

TABLE 1. Growth response of *Sporobolus poiretii* inoculated with *Aphelenchoides besseyi*

Treatment (5 months)	Avg top wt	Avg no. seed heads	Avg height
Shadehouse ^a	g		cm
Nematodes	19.8 ^b	4.9 ^b	97.7
Controls	14.2 ^b	3.7 ^b	97.9
Full sun			
Nematodes	52.0 ^b	56.7	89.3
Controls	48.0 ^b	49.1	88.3

^a Two shadehouse experiments gave similar results.

^b Differences between averages are statistically significant at the 1% level.

the inoculated samples. Two similar experiments had been carried out in a shadehouse, where grass was etiolated and seed heads were unusually tall, spindly, and sparse.

Grass which had been inoculated with nematodes had a greater top wt than noninoculated grass. This was true both in shade and in full sunlight (Table 1). More seed heads were produced by nematode-inoculated grass plants than by controls. Height of plants was not significantly affected by nematodes.

The relationships of *A. besseyi* and its hosts are not known sufficiently to offer an explanation for the more numerous inflorescences and greater top wt of *S. poiretii*. Madamba et al. (2) report increased growth of certain unsuitable hosts when they are infected by *Meloidogyne* spp. They postulated increased lateral root production due to hypersensitive reactions by infected root apices. Jenkins & Taylor (1) reported increased root growth, top growth, and crop yield to result from light infections of hosts by *Meloidogyne* spp. It has long been recognized that, for certain hosts, infection by *M. hapla* results in excessive root proliferation. Mountain (5) and Viglierchio & Yu (6) have explained, in part, host reactions by nematodes on a biochemical basis.

These examples show it is possible for a plant to be stimulated by a parasite to greater growth, especially when population levels of the parasite are low. Further work is needed to elucidate the nature of the biochemical and/or mechanical factor which results in growth stimulation of *S. poiretii* by *A. besseyi*.

LITERATURE CITED

- JENKINS, W. R., & C. P. TAYLOR. 1967. Plant nematology. Reinhold & Co., N. Y. 270 p.
- MADAMBA, C. P., J. N. SASSER, & L. A. NELSON. 1965. Some characteristics of the effects of *Meloidogyne* spp. on unsuitable host crops. N. C. Agr. Exp. Sta. Tech. Bull. 169. 34 p.
- MARLATT, R. B. 1966. *Ficus elastica* a host of *Aphelenchoides besseyi* in a subtropical climate. Plant Dis. Repr. 50:689-691.
- MARLATT, R. B. 1970. Transmission of *Aphelenchoides besseyi* to *Ficus elastica* leaves via *Sporobolus poiretii* inflorescences. Phytopathology 60:543-544.
- MOUNTAIN, W. B. 1960. Mechanisms involved in plant-nematode relationships, p. 426-431. In J. N. Sasser & W. R. Jenkins [ed.]. Nematology fundamentals and recent advances with emphasis on plant parasitic and soil forms. Univ. N. C. Press, Chapel Hill.
- VIGLIERCHIO, D. R., & P. K. YU. 1965. Plant parasitic nematodes: a new mechanism for injury of hosts. Science 147:1301-1303.