

Host Efficiencies of *Zea diploperennis* and *Z. perennis* for *Pratylenchus* spp.

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In previous tests, the perennial teosintes, *Zea diploperennis* Iltis, Doebley & Pazy (4) and *Z. perennis* Hitchcock (Norton, unpubl.), supported significantly fewer *Pratylenchus scribneri* Steiner and (or) *P. hexincisus* Taylor & Jenkins than did some public dent hybrids and other types of maize (*Zea mays* L.). The perennial teosintes were never included in the same test, however. For a better comparison of host efficiencies of these teosintes for *Pratylenchus* spp., both cultivars were included in the same tests in the field and greenhouse.

Field plots consisted of two rows, 3 m long and 76 cm between rows, with 20 plants per plot at the Iowa State University Hinds Research Farm, Ames, Iowa. The teosintes were 5-week-old rooted transplants propagated by division from greenhouse-grown plants. The transplants and seed of Mo17Ht × B73Ht, which was used as a standard in previous tests (6), were planted in the field on 13 May 1987. The soil analysis was 86% sand, 10% silt, 4% clay; pH 7.2, 1.6% organic matter. A randomized block with six replications was used. The field soil contained mostly *P. hexincisus* but also included some *P. scribneri*. Other plant-parasitic nematodes were few and are not considered to be a factor in populations of *Pratylenchus* spp.

The same cultivars were used in the greenhouse test. Soil in the greenhouse consisted of 60% sand, 23% silt, 17% clay;

pH 7.6, 2% organic matter. The soil was placed in 15-cm-d clay pots and each pot was infested with $2,400 \pm 180$ *P. hexincisus* at planting on 1 June 1987. There were five replications of four pots each in a randomized design. Log transformations of the field and greenhouse data were analyzed by ANOVA and Fisher's LSD was used for paired comparisons.

There were significant differences in host efficiencies between the perennial teosintes in the greenhouse but not in the field (Tables 1, 2). There were significant differences between the perennial teosintes and Mo17Ht × B73Ht in both the field and greenhouse. After 103 days in the greenhouse, numbers of *Pratylenchus* per gram dry root weight were reduced by 82% *Z. perennis* and 98% for *Z. diploperennis*, relative to Mo17Ht × B73Ht (Table 1). In the field, numbers of *Pratylenchus* per gram dry root weight were reduced by 76–96% for *Z. diploperennis* and 67–91% for *Z. perennis*, relative to Mo17Ht × B73Ht, depending on sampling date (Table 2).

The rediscovery of the perennial teosinte, *Zea perennis* (1), a tetraploid, and the discovery of the diploid perennial teosinte, *Z. diploperennis* (2), have created much interest because of their relationship to *Z.*

TABLE 1. Numbers of *Pratylenchus hexincisus* in maize and perennial teosintes after 103 days in the greenhouse.

Cultivar	Nematodes/g dry root wt	
	Mean	Standard deviation
Mo17Ht × B73Ht	143,381 a	109,477
<i>Zea perennis</i>	25,366 b	20,472
<i>Zea diploperennis</i>	3,055 c	2,878

Numbers followed by the same letter are not significantly different ($P = 0.05$).

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TABLE 2. Numbers of *Pratylenchus* spp. in maize or perennial teosintes at the Iowa State University Hinds Farm, 1987.

Cultivar	Nematodes/g dry root wt		
	16 July	20 Aug.	4 Sept.
Mo17Ht × B73Ht	4,099 a	860 a	907 a
<i>Zea perennis</i>	1,368 b	134 b	80 b
<i>Zea diploperennis</i>	985 b	112 b	35 b

Numbers followed by the same letter are not significantly different ($P = 0.05$).

mays and because *Z. diploperennis* carries disease resistance to maize viruses (3). The diploid perennial teosinte crosses readily with maize (5), and fertile hybrids have been obtained by many breeders. Although the perennial teosintes are not immune to the *Pratylenchus* spp. used here and in previous tests, they supported significantly fewer

nematodes than did some common maize lines.

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