

Infection of Shell and Peg Tissues of Six Peanut Cultivars by *Pratylenchus brachyurus*

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ABSTRACT

Six peanut cultivars, including both Virginia and Spanish types, were equally infected by *Pratylenchus brachyurus* as determined by the number of nematodes recovered from shells and pegs. However, lesions were not as conspicuous on pods of Virginia Bunch 67 and Georgia 186-28 as on Florigiant,

Early Runner, Argentine, and Starr. Shell tissues of Virginia Bunch 67 and Georgia 186-28 were less sensitive either to the nematodes or to microbial effects, following nematode invasion, or to both. *Phytopathology* 60:472-474.

Lesions on peanut (*Arachis hypogaea* L.) shells caused by *Pratylenchus* sp. were reported in the United States in 1945 from Holland, Virginia, by Steiner (12). He later found this nematode in peanuts collected near Fairhope, Alabama (13). In 1950 (3), and again in 1953 (11), this nematode was reported to occur in peanuts in several locations in Georgia. During recent years, *P. brachyurus* (Godfrey, 1929) Filip & Sch. Stek., 1941, has been associated with injury to peanuts in several other southern states (1). This nematode can attain high populations on peanuts, and can cause injury to roots, pods, and pegs (4, 5, 6). Boswell (2) reported that black hull (blotchy hull) of irrigated Spanish peanuts was controlled by preplant soil application of nematicides to field soil infested with *P. brachyurus*. Yields and kernel quality were increased. An application of the fungicide pentachloronitrobenzene (PCNB) at planting time failed to control the black hull condition, although yields and quality were increased.

No peanut cultivar has been reported resistant to *P. brachyurus*. In 1950, however, Boyle (3) stated that limited observation indicated that infection on the large, heavy-shelled Virginia Bunch type was not as conspicuous as on lighter-shelled Spanish type. This paper reports results of *P. brachyurus* infection studies with six peanut cultivars representing both the Virginia and Spanish types (7).

MATERIALS AND METHODS.—Four Virginia (Florigiant, Virginia Bunch 67, Early Runner, Georgia 186-28) and two Spanish (Argentine, Starr) type peanuts were tested in 1967 and 1968. Each cultivar was replicated six times in rows 27.4 m long. The soil was a Tifton sandy loam naturally infested with *P. brachyurus*. Good cultural practices were followed. The Virginia type requires longer to mature, so it was planted 14 days before the Spanish so that all cultivars matured at approximately the same time (10). The two types were grown varying lengths of time as follows: Virginia, 1967, 126 days; 1968, 134 days; Spanish, 1967, 110 days; 1968, 120 days. Jackson & Minton (8) reported that few *P. brachyurus* were recovered from shells and pegs of Argentine after 92 days, but sharp

increases in numbers occurred from 107 to 133 days.

Approximately 1,000 ml of mature pods with attached pegs were randomly collected from each plot. After being washed, 50 pods were selected at random and scored for discoloration, with the least and most severely discolored pods receiving ratings of 1 and 5, respectively. The number of nematodes present in shells was determined in 1967; the number of nematodes in both shells and pegs was determined in 1968. Nematodes were extracted from 100 cm² of shell and 2 gm of peg/sample. Estimates of pod surface area were made according to the cylinder method described by Jackson & Samples (9). Each shell sample consisted of several half-shells; the other half was discarded. Only the underground portion of pegs was used. Pegs and shells were chopped separately in a food blender and placed in Baermann funnels. The tissues were incubated in a moist chamber for 48 hr to recover the nematodes. The nematodes were then collected on a 400-mesh screen, transferred to a counting dish, and counted under a stereoscopic microscope.

RESULTS AND DISCUSSION.—In 1967, significantly more *P. brachyurus* were recovered from shells of Florigiant than from any other cultivar (Table 1). In 1968, however, differences in numbers of nematodes recovered were not significant for either shells or pegs. Pod discoloration indices differed in both years. In 1967, Virginia Bunch 67 and Georgia 186-28 had significantly fewer pod lesions than the other four cultivars (Table 1, Fig. 1). In 1968 the relationship was about the same, except that Georgia 186-28 did not differ significantly from Early Runner.

These data do not indicate an appreciable difference among the six cultivars in the number of *P. brachyurus* in shell and peg tissues. Neither do they indicate a direct relationship between number of nematodes per unit of pod surface area and pod lesions. Instead, there appeared to be a difference in reaction of the shells of the different cultivars to the nematode. Shell tissues of Virginia Bunch 67 and Georgia 186-28 were either less sensitive to the nematodes, to the microbial effects following nematode invasion, or both.

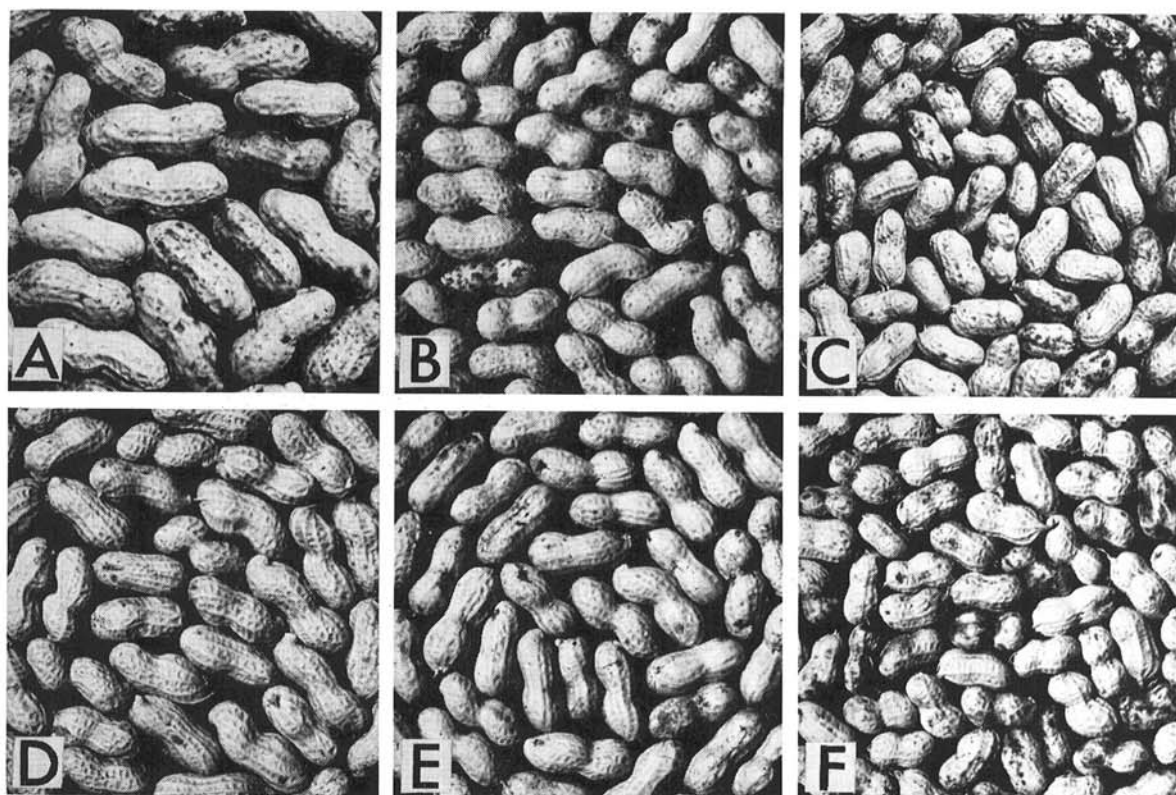


Fig. 1. Peanut pods grown in soil infested with *Pratylenchus brachyurus*. A) Florigiant; B) Early Runner; C) Argentine; D) Virginia Bunch 67; E) Georgia 186-28; F) Starr. The smaller-podded Argentine and Starr are Spanish type.

Boyle (3) concluded that infection of the Virginia Bunch type was not as conspicuous as was infection of the Spanish type, due to the concealment of the infection sites by the heavier structure and the tissues of the former, but he neither named the specific cultivars studied nor gave discrete data or methods used. Our data indicate that lesion expression varies among

cultivars within the Virginia type. Within the Virginia type, our results were similar to Boyle's observations for Virginia Bunch 67 and Georgia 186-28, but dissimilar for Florigiant and Early Runner.

The application of these results may be beneficial in selecting cultivars for the "in-shell" roasted peanut trade where bright, blemish-free pods are preferred.

TABLE 1. Mean number of *Pratylenchus brachyurus* in peanut shells and pegs and lesion indices of shells

Peanut type and cultivar	1967		1968		Pod lesion index ^b
	No. nematodes in shell ^a	Pod lesion index ^b	No. nematodes		
			Shell ^a	Peg ^c	
Virginia					
Florigiant	41.1 a ^d	3.5 bc	32.7 a	219.3 a	4.3 a
Early Runner	13.8 b	2.8 c	30.3 a	289.8 a	3.0 bc
Georgia 186-28	9.4 b	1.7 d	22.0 a	388.2 a	2.3 cd
Virginia Bunch 67	5.2 b	1.3 d	16.5 a	280.0 a	2.0 d
Spanish					
Argentine	7.4 b	4.2 ab	30.0 a	273.7 a	3.8 ab
Starr	4.5 b	4.5 a	21.8 a	303.7 a	3.7 ab

^a No. nematodes per cm² of shell surface.

^b Pod lesion index based on 1 = no lesions; 2 = few lesions; 3 = moderate no. lesions; 4 = many lesions; 5 = very many lesions.

^c No. nematodes per g of pegs.

^d Means with a letter in common do not differ at $P = .05$, according to Duncan's multiple range test. Data for number of nematodes in shells and pegs transformed to $\sqrt{n+1}$ for statistical analysis.

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