NOTE

TARNISHED PLANT BUG (HETEROPTERA: MIRIDAE) POPULATIONS ON A SUSCEPTIBLE AND A RESISTANT SOYBEAN[1]

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The tarnished plant bug (TPB), *Lygus lineolaris* (Palisot de Beauvois), is a pest of a large number of crops grown in the United States (Young, 1986. Ann. Entomol. Soc. Amer. 79: 747-62). Broersma and Luckman (1970. J. Econ. Entomol. 63: 253-56) found that adults feeding on soybeans for as little as 24 hours caused deleterious effects on some buds, blossoms, and pods and suggested they could contribute to reduced yield. The TPB has been reported in surveys of insects found on soybeans in several areas of the United States (Kretzschmar, 1948. J. Econ. Entomol. 41: 586-91., Probst and Everly, 1957. Agron. Jour. 49: 385-87. Ratcliffe et al. 1960 J. Econ. Entomol. 53: 131-33., Blickenstaff and Huggans, 1962. Mo. Agr. Expt. Sta. Bul. 803., Tugwell et al. 1973. Ark. Agri. Exp. Sta. Rep. Ser. 214, pp. 3-18., Snodgrass et al. 1984. J. Ga. Entomol. Soc. 19: 93-101). Numbers of TPB's found in soybean, although usually low, can be high indicating a possibility of TPB adapting to the crop. For example, as many as 115 TPB's per 100 sweeps with a standard 38-cm sweep net were reported in late-planted soybeans in Arkansas (Tugwell et al. 1973. Ark. Agri. Exp. Sta. Rep. Ser., 214, pp. 3-18). However, we know of no season long field data where TPB's were sampled in soybeans in replicated plots in numbers sufficient for statistical analysis or where comparisons could be made between susceptible and resistant genotypes.

In 1987, a replicated field test was conducted in late-planted (30 June) soybeans located in Sharkey County near Rolling Fork, Mississippi. The TPB populations found on the cultivar 'Centennial' were compared to those found on the breeding line D82-3885. This line, like its donor parent, plant introduction (PI) 229358, has resistance to several foliar feeding insects (Clark et al. 1972. J. Econ. Entomol. 65: 1699-72., Hatchett et al., 1976. Crop Sci. 16: 277-80., Lambert and Kilen, 1984. J. Econ. Entomol. 77: 622-25), but has not been evaluated for TPB resistance. D82-3885 was released as a cultivar ('Lamar') in early 1989. Experimental design was a randomized complete block with 4 replications with Centennial and D82-3885 as treatments. Plot size was 0.24 ha (48 rows on 1 m centers × 49.7 m long). Samples were taken with a drop cloth and consisted of 2.0 m of row (1.0 m on each of 2 adjacent rows). The drop cloth sampling procedure does not determine absolute TPB, nymph or adult, populations. Since adult TPB's are active fliers and may escape during the sampling process, the procedure gives a

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more accurate estimate of numbers of nymphs than of adults (Young and Tugwell, 1975. Ark. Agri. Exp. Sta. Rep Ser. 219, 12 pp). However, theefficacy of the procedure is the same among plant types with similar morphology. Therefore, comparison of TPB samples from D82-3885 and Centennial, which have essentially identical phenology and morphology, can be used to detect differences in population levels. Samples were taken on 7, 14, 21, and 28 August; 8, 14, 21, and 28 September; and on 5 October. On each sample date, 4 samples were taken from random locations in each replication of both treatments. The number and development stage of TPB's were determined and recorded in the field. Data were analyzed by sample dates using the analysis variance procedure (SAS. 1982. SAS Institute, Cary, NC). After analysis, data were converted to numbers of TPB's per hectare.

TPB's were first found on 21 August when the soybeans in both treatments had flower buds and a few blooms. Both Centennial and D82-3885 bloom at approximately the same time. The highest mean numbers of nymphs were found on 28 August (Table 1). D82-3885 had significantly lower numbers of nymphs (P = 0.02) and adults (P = 0.06) than were found in Centennial on this date. D82-3885 had lower mean numbers of nymphs and adults on 8 September, but the differences were not significant. D82-3885 had significantly lower numbers of adults (P = 0.07) and nymphs (P = 0.05) than were found on Centennial when means for all sample dates were compared (Table 1). The highest population found in the Centennial soybeans on 28 August was ca. 6000 adults and nymphs per hectare. Because numerous other pests also were present in the soybeans, any effect this population might have had on yield could not be determined. It is interesting to note that TPB reproduction in soybean was observed only during the time plants were flowering or had small pods. This is a characteristic of TPB in that it seldom oviposits on foliage unless flower buds, flowers, or young fruit are present (Strong, 1968. J. Econ. Entomol. 63: 808-14 and 1970, 63: 808-14).

Table 1. Tarnished Plant Bug populations occurring on 'Centennial' and D82-3885 soybeans in Sharkey County, MS during 1987.

Date		$\bar{x}$ no./ha† Nymphs		Adults	
		D82-3885	Centennial	D82-3885	Centennial
August	7	0	0	0	0
	14	0	0	0	0
	21	0	295	0	0
	28	1229****	4624	0**	1869
September	8	640	1925	295	2164
	14	0	640	295	295
	21	0	0	295	0
	28	0	0	0	0
October	5	0	0	295	640
All Dates		197***	689	148*	541

† Asterisks indiccte significant differences in TPB mean between cultivars: *P = 0.07; **P = 0.06; ***P = 0.05; and ****P = 0.02.

D82-3885 has the resistance of PI 229358 which has been shown to be resistant to foliar feeding insects primarily by antibiosis (Van Duyn et al. 1972. Crop Sci. 12: 561-62; Lambert and Kilen, 1984. J. Econ. Entomol. 77: 622-25). It is not known whether the significantly lower numbers of nymphs and adults found on this line, compared to the number found on Centennial, was due to the same factors which give it resistance to other insect species.