SPANOGONICUS ALBOFASCIATUS (HEMIPTERA: MIRIDAE): A PREDATOR IN FLORIDA SOYBEANS[1,2]

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ABSTRACT

The predaceous mirid *Spanogonicus albofasciatus* (Reuter) was collected in northwestern Florida soybean fields during the summer of 1971. It was most common on young soybean plants, and populations declined rapidly as plants grew. Predation studies in the field indicated that *S. albofasciatus* is apparently a predator of *Heliothis zea* (Boddie) and *Pseudoplusia includens* (Walker) eggs.

During the summer of 1971, a black fleahopper, *Spanogonicus albofasciatus* (Reuter), was found in northwestern Florida soybean fields. Although present on many crop plants, *S. albofasciatus* apparently has not previously been reported as a predator in soybean fields. This black fleahopper is widely distributed in the United States. In southern California it was first reported on alfalfa (Van Duzee 1914). *S. albofasciatus* has been cited as a pest of cotton seedlings, cucurbits, corn, alfalfa, and other plants in an area extending from Arizona to North Carolina (Coop. Econ. Insect Report). It was reported damaging golf greens in New York (Knight 1941) and Missouri (Knight 1941, Satterthwait 1944) and carrots, beets, and chards in Hawaii (Holdaway 1944). *S. albofasciatus* was found on grapes and coreopsis in Illinois (Knight 1941). Blatchley (1926) reported it from Florida. Host plants in Arizona (Stoner 1965) included 31 species and 16 families. Telford et al. (1962) attributed square shedding of slow-growing cotton varieties to the feeding of *S. albofasciatus* adults and nymphs on the young foliage. Subsequently, Stoner and Bottger (1965) found feeding damage by this black fleahopper to be negligible and also showed it to be somewhat predatory. Butler and Stoner (1965) published the life history of *S. albofasciatus*.

There is reason to believe that it may be predaceous on major crop pests. Recently, laboratory studies (Butler 1965) have revealed *S. albofasciatus* to be a potentially important predator of mites, bollworm eggs, aphids, and lygus bugs. Closely related species have been reported feeding on such diverse prey as moths, leafhoppers, and mites (Sweetman 1958, MacLellan 1962, Beingolea 1959). To determine its possible effect on noctuid pests of soybeans, the seasonal abundance and predatory activity of *S. albofasciatus* were observed at Quincy, Florida during 1971.

METHODS AND MATERIALS

Seasonal abundance of adult *S. albofasciatus* was determined from

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TABLE 1. NUMBER OF ADULT *Spanogonicus albofasciatus* COLLECTED IN WEEKLY D-VAC SAMPLES DURING THE SUMMER OF 1971 IN QUINCY, FLORIDA.

Sampling Date	No. of adult specimens per acre		
	Bragg Plot	Hampton Plots	
June 26	480		
July 1	170		
8	50		
15	20		
22	10		
29	10	240	480
Aug. 5	0	100	280
12	0	60	140
19	0	30	20
26	0	0	20
Sept. 2	0	0	0

specimen counts in field samples collected from late June until mid-October. A 1 acre plot of 'Bragg' soybeans, planted 12 May, was sampled from 26 June through 1 Oct. Beginning 28 July and terminating 15 Oct., two 1 acre plots of 'Hampton' soybeans, planted 22 June, were also sampled. A D-vac insect sampler with a 34 in.^{2} cone opening and 2700 r.p.m. motor was used for all collection. A total of 1,298 ft of row was sampled weekly in every plot.

Egg predation observations were begun 26 July and continued intermittently through September. Laboratory-reared *Heliothis zea* (Boddie) eggs were placed in all 3 of the above mentioned plots. The eggs were transferred from paper towels to the leaf surface by using a camel's hair brush dipped in egg albumen (Bell and Whitcomb 1964). The eggs were checked periodically during the 24 hr. period following their placement in the field.

During August, three 6 × 6 × 6 ft screen oviposition cages were placed over soybeans in the field. Black fleahoppers within the cages were those which occurred naturally on the soybean plants. Soybean looper, *Pseudoplusia includens* (Walker), adults were released inside the cages. The resulting eggs, numbering 1 to 30 per plant, were observed for predatory activity by *S. albofasciatus*. Three weeks after oviposition, fleahoppers in the cages were counted.

RESULTS AND DISCUSSION

During the sampling period, populations of adult *S. albofasciatus* in the early-planted 'Bragg' plot were highest on 26 June when 45 were collected in 1 sample. This number represents a minimum population estimate of 450 adults per acre. After this date numbers declined rapidly until 29 July, after which none were collected (Table 1). Sampling of the late

planted 'Hampton' plots revealed high population levels in late July and early August, followed by a rapid decline.

It should be noted that since the greatest numbers of fleahoppers were collected on the initial day of sampling in all plots, it is probable that peak populations occurred in the field prior to the initiation of sampling. The soybean plants during this time were 8 in. tall or less.

The difference in dates of peak abundance of adult *S. albofasciatus* between the early and late planted plots suggests that there is some correlation between the age of soybean plants and fleahopper abundance. There could be several reasons for this. Perhaps only young soybean plants may support prey species important to the survival of *S. albofasciatus*. Another possibility is that the fleahopper may be able to obtain plant juices essential to its development from young soybeans, but not from older ones. Also, older plants may harbor more natural enemies of *S. albofasciatus*. In addition, the microclimate around large soybean plants may be unfavorable to these fleahoppers.

S. albofasciatus adults were observed feeding on bollworm eggs on 14 occasions between 26 July and 16 August in late planted plots. After 16 August no more fleahoppers were seen. In all but 1 instance, feeding began after nightfall, sometimes continuing after daybreak. One individual was observed continuously from 2 AM until 10 AM during which time 14 *H. zea* eggs were consumed.

Within the cages, adult *S. albofasciatus* were observed feeding on looper eggs and the fleahoppers gathered on leaves where the eggs were most abundant. The number of soybean looper larvae in the cages was approximately 1/10 as great as egg counts. Most of the reduction oppeared to result from egg predation by fleahoppers. Three weeks following oviposition by soybean looper moths, the number of *S. albofasciatus* individuals in cages ranged from 5 to 13 per plant. This was much higher than fleahopper populations outside of the cages and probably represented increases resulting from an abundant food supply, mechanical exclusion of predators, and perhaps a more favorable microclimate.

Predation by *S. albofasciatus* may be 1 factor that limits populations of noctuid moths such as *Heliothis zea* (Boddie), *H. virescens* (Fab.), *Pseudoplusia includens* (Walker), and *Plathypena scabra* (Fab.) which are present early in the growing season. Recent research has shown that the most serious pest of Florida soybeans, the velvetbean caterpillar, *Anticarsia gemmatilis* Hübner, does not generally occur in heavy infestation until mid-August in north Florida when effects of *S. albofasciatus* are minimal or nonexistent. However, in early infestations of the velvetbean caterpillar in south and central Florida *S. albofasciatus* may be of considerable importance.

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