

**SAMPLING PREDACEOUS ARTHROPODS AND PESTS IN SOUTH CAROLINA COTTON**  
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**Abstract**

We assessed the effectiveness of the beat cloth (1m. sq.), beat pan (2 gal. plastic), beat bucket (5 gal. plastic), and sweep net (15 in. dia.) sampling methods for predaceous arthropods and plant bugs. We also evaluated the effects of time of day on numbers of insects sampled. Large 1/4 acre plots of conventional, Bollgard and Bollgard II were planted 28 April under center pivot irrigation in a randomized complete block design with 4 replicates per genotype. Plots were divided in half for a.m. and p.m. sampling. Predaceous arthropods and plant bugs were sampled 5 times throughout the season. The number of samples taken were: beat cloth, 4 per plot; beat pan, 6 per plot; beat bucket, 6 per plot; sweep net, 20 sweeps across and through 2 adjacent rows. After collection, beat pan and beat bucket samples were doubled to better approximate 4 meters of row (ca. 30 plants). Two sets of sweep net samples were taken, a set by the senior author through out the season (sweep net AMH) and a set, using similar techniques, by an individual randomly assigned during each sampling period (sweep net VAR). Morning samples were taken around 10:00 a.m. after the dew dried and afternoon samples were taken around 4:00 p.m. or near as possible to the hottest time of the day. Data were analyzed using a Mixed Model ANOVA where method, time, and date were fixed effects.

During the course of this study, 15,912 predators and 2,541 plant bugs (primarily *Lygus lineolaris*) were sampled. Of these predators, geocorids (primarily *Geocoris punctipes*) (3,405; 21.4%), ants (primarily *Solenopsis invicta*) (2,833; 17.8%), spiders (3,808; 23.9%), lady beetles (3,206; 20.1%) and minute pirate bugs (*Orius insidiosus*) (1,362; 8.6%) were the most numerous. Overall, higher percentages (32-40%) of all major predator groups, with the exception of *Orius*, were sampled using the beat cloth. More *Orius* (39%) were collected either with the beat pan in early season, (<13nodes) or beat bucket in late season (>13 nodes). Despite the inconsistencies associated with its use, predators and *Lygus* can be sampled quickly during the early season with the sweep net. Throughout the study, similar numbers of predators and *Lygus* were sampled with the beat bucket and sweep net methods. Significantly more predators and *Lygus* were sampled with the beat cloth than any other method, particularly during mid to late season when nymphs were more common and cotton was above 10 nodes. Effectiveness of the beat cloth method was due to the fact that a greater portion of each plant was sampled compared with other methods. Time of day had no consistent effect on numbers of predaceous arthropods or *Lygus* sampled. This was probably due to unusually mild field conditions during 2001 when average daily high temperatures were 90°F for the 5 sampling days.

Table 1. Comparison of Mean Number of Predators and Plant Bugs Sampled from 4 Meters of Row<sup>1</sup> with Various Methods.

Method	Mean Number in 4 Meters Row					
	Predators			Plant Bugs		
	15 June	06 July	19 July	15 June <sup>2</sup>	06 July <sup>3</sup>	19 July <sup>4</sup>
Beat Cloth	33.0a	50.1a	62.2a	2.0a	10.0a	12.5a
Beat Pan	29.6a	17.5c	*	4.7b	4.8b	*
Beat Bucket	*	22.8bc	23.2c	*	4.5b	4.1b
Sweep Net AMH	21.1b	29.0b	30.0b	4.3b	5.5b	6.0b
Sweep Net VAR	12.7c	15.5c	23.1c	4.3b	3.9b	6.0b

<sup>1</sup> Approximately 30 plants, growth stage: 15 June, 8-10 nodes; 06 July, 14-15 nodes; 19 July, 15-17 nodes.

<sup>2</sup> Primarily *Lygus* sp.; n = 377, Adults 83.8%; Nymphs 16.2%.

<sup>3</sup> Primarily *Lygus* sp.; n = 627, Adults 28.2%; Nymphs 71.8%.

<sup>4</sup> Primarily *Lygus* sp.; n = 648, Adults 35.0%; Nymphs 65.0%.