NOTE

Annual Contamination of *Heliothis zea* (Lepidoptera: Noctuidae) Moths with *Aspergillus flavus* and Incidence of Aflatoxin Contamination in Preharvest Corn in the Georgia Coastal Plain[1, 2]

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Surveys of preharvest corn, *Zea mays* L., in the Coastal Plain of Georgia have shown that *Aspergillus flavus* Link infection and subsequent aflatoxin contamination of the grain is a chronic problem that varies in magnitude from year to year (McMillian et al. 1985, J. Environ. Qual. 14: 200-02). Additionally, research has demonstrated that some insects can significantly enhance the aflatoxin problem by transporting fungal spores and/or damaging the ear (Widstrom et al. 1975, J. Econ. Entomol. 68: 855-56; Barry et al. 1985, Environ. Entomol. 14: 634-36; McMillian et al. 1987, J. Entomol. Sci. 22: 307-10). Some corn earworm, *Heliothis zea* (Boddie), moths are suspected of becoming contaminated with *A. flavus* as they emerge from the soil. Moths frequently visit and oviposit on silks of developing corn ears. Resulting larvae that are contaminated have the potential of transporting the fungus to favorable growth sites as they feed on the ear. The objective of this study was to gain information on the relationship between *A. flavus* contamination levels of corn earworm moths and aflatoxin contamination levels in preharvest corn in the Georgia Coastal Plain.

Corn earworm moths were captured during 12 corn growing seasons (1977-1988) and screened for spore contamination. During the months of June through August (usual ear developmental period), corn earworm moths were collected from a wooden frame walk-in light trap covered with window screen. The trap was surrounded by corn fields in Tift County, GA. Each weekday morning about 0900 hours, moths (an average of five per day) were collected individually in small sterile plastic bags. The technique involved placing the open bag over the resting moth and trapping it without touching. All bags then were sealed, dated, and placed in a freezer. Later, using sterile equipment and supplies, moths were placed individually in petri dishes containing *A. flavus* selective media with 3% sodium chloride added (Griffin, G. J. and K. H. Garren. 1974. Phytopathology 64:

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322-325). Dishes then were incubated at 30°C and observed after six days for the presence of the yellow-green *A. flavus* group fungi. Additionally, mature corn grain was harvested each season from 30 to 45 randomly selected corn fields in and around Tift County and tested for the incidence of aflatoxin contamination as described by McMillian et al. 1978 (J. Environ. Qual. 7: 564-566).

The percent contamination of corn earworm moths with *A. flavus* ranged from 12% in 1982 to 87% in 1981 (Table 1). Overall, *A. flavus* contamination levels for moths averaged 48%, 53% and 50% for the months of June, July, and August, respectively. There were no significant differences among monthly values ($P>0.05$). The incidence of corn contamination with aflatoxin ranged from 37% in 1984 to 100% in 1980. A significant correlation ($r = 0.60$, $P<0.05$) was found between yearly means of aflatoxin contamination of grain sampled from several counties and *A. flavus* contamination of moths collected at a point source. Although these data provide some insight into the possible relationship between *A. flavus* contaminated moths and aflatoxin contaminated preharvest corn, additional studies are needed to determine the potential of using mid-season moth contamination data to predict expected levels of aflatoxin contamination of grain at harvest. An early warning system such as this could be of immeasurable value to the grain producer.

Table 1. Percent *Aspergillus flavus* group contamination of *Heliothis zea* moths collected in Tift County, Georgia and aflatoxin contamination of preharvest corn sampled in and around Tift County, GA.

	% contamination			% contamination	
Year	*A. flavus* in moths	Aflatoxin* in corn	Year	*A. flavus* in moths	Aflatoxin in corn
1977	74	90	1983	67	89
1978	66	85	1984	18	37
1979	28	74	1985	66	60
1980	52	100	1986	63	97
1981	87	84	1987	23	76
1982	12	57	1988	26	78

* Aflatoxin values for 1977 through 1982 previously published (McMillian et al. 1985, J. Environ. Qual. 14: 200-02).