

# ENTOMOLOGY

## VALIDATION/REFINEMENT OF CORN EARWORM ECONOMIC THRESHOLDS FOR SOYBEANS

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**THESE DATA WILL PROVIDE GROWERS TREATMENT GUIDELINES FOR CORN EARWORM INFESTING SOYBEANS THAT TAKE INTO ACCOUNT COMMODITY PRICE AND CONTROL COSTS.**

In recent years, corn earworm has surpassed stink bugs and soybean loopers as the primary insect pest of soybeans in Mississippi. Current thresholds for bollworms after bloom in Mississippi are three larvae per foot of row using a drop cloth or nine larvae per 25 sweeps using a sweep net. The current thresholds used in Mississippi are based on older research that utilized varieties that are later maturing than currently planted varieties and have a determinate growth habit. The majority of the currently planted varieties are Maturity Group 4 and 5 with all of the Maturity Group 4 varieties and many of the Maturity Group 5 varieties having an indeterminate growth habit. Also, soybean yields have steadily increased over time and these thresholds were developed when

soybean yield potential was substantially less than it is now. For these reasons, thresholds need to be validated or refined to reflect the current soybean production environment. These studies were conducted using Asgrow 4605 and Asgrow 4632 soybeans, with a 4.6 maturity rating and an indeterminate growth habit. Studies were conducted in 6-foot x 6-foot field cages.

The treatments in this study were moth mating/oviposition duration of 5, 7, 9 and 11 days to give a range of larval densities as well as a non-infested control. Cages were infested with approximately 10 pair of corn earworm pupae. The soybean growth stage target for the infestation timing was R1-R2 stage, which most commonly represents natural bollworm infestations into soybean fields in Mississippi.



*Corn earworm*

Once eclosed, moths were then removed according to infestation duration treatment. Yield measurements were recorded at the end of the growing season.

A significant relationship between larval density using drop cloth sampling and yield was observed. Based on the regression equation, for every corn earworm larva per row foot, yield was reduced by 1.28 bu/ac. Economic injury levels for drop cloth sampling were calculated using these data and equation and

**Table 1.** Economic thresholds for corn earworm larvae based on drop cloth sampling.

Crop value (\$/bu)	Larvae/row ft				
	Control Costs (\$/acre) <sup>1</sup>				
	10	15	20	25	30
6	1.0	1.5	2.0	2.4	2.9
7	0.8	1.3	1.7	2.1	2.5
8	0.7	1.1	1.5	1.8	2.2
9	0.7	1.0	1.3	1.6	2.0
10	0.6	0.9	1.2	1.5	1.8
12	0.5	0.7	1.0	1.2	1.5
13	0.5	0.7	0.9	1.1	1.4

Based on early planted Maturity Group IV soybean varieties with >50 bu/acre yield potential.  
<sup>1</sup>Including application costs.

economic thresholds for a range of commodity prices and control costs were set at 75% of the economic injury level (Table 1). Using a conversion factor to convert from drop cloth sampling to sweep net sampling, economic injury levels for sweep net sampling were calculated for the same range of commodity prices and control costs as for drop cloth sampling. Economic thresholds for sweep net sampling were also set at 75% of the economic injury level (Table 2).

**Table 2.** Economic thresholds for corn earworm larvae based on sweep net sampling.

Crop value (\$/bu)	Larvae/25 sweeps				
	Control Costs (\$/acre) <sup>1</sup>				
	10	15	20	25	30
6	7.4	11.0	14.7	18.4	22.1
7	6.3	9.5	12.6	15.8	18.9
8	5.5	8.3	11.0	13.8	16.5
9	4.9	7.4	9.8	12.3	14.7
10	4.4	6.6	8.8	11.0	13.2
12	3.7	5.5	7.4	9.2	11.0
13	3.4	5.1	6.8	8.5	10.2

Based on early planted Maturity Group IV soybean varieties with >50 bu/acre yield potential.  
<sup>1</sup>Including application costs.