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2017

*Annual report & Summary*  
**Mississippi Peanut Growers Association**

**Funding Year: 2017**

**Impact of Defoliating Insect Pests on Peanut Yields and Management Options**

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Expenses to date have included the salary and fringe benefits for a Ph.D. graduate student, Mrs. Brittany Lipsey.

**Objectives:**

- 1) **To determine the impact of insect defoliation on peanut development and yield**
- 2) **To evaluate foliar insecticides for control of defoliating insect pests (corn earworm, cutworm, fall armyworm, etc.) and their impact on yields.**

**Report of Progress**

**Objective 1.** Multiple experiments were conducted in Stoneville, MS and Starkville, MS as part of this objective. Manual defoliation experiments were completed on seedling stage peanuts to evaluate the impact on peanut yields at two locations in Mississippi. All of these defoliation experiments have been completed and plant growth parameters have been measured. Yields have been recorded from the Stoneville location. Additionally, multiple experiments have been initiated where caterpillar pests have been manually infested in peanuts at different stages. Currently, experiments conducted at early flowering to pod set (40-60 days after emergence) have been completed. We able to successfully achieve up to 50% defoliation using live insects to help support previous hand defoliation experiments.

Preliminary results from the Stoneville experiments suggest that defoliation can significantly reduce peanut yields during the seedling stage. Based on the regression analysis, peanut yields were reduced by 5.66 lbs per acre for every 1% of defoliation (Fig. 1). In a separate experiment, the presence of grassy weeds during the seedling stage did not have an impact on how defoliation impacted peanut yields. However, peanut yields were significantly reduced from 100% defoliation compared to 0 and 50% defoliation (Fig. 1). We were never able to achieve greater than 50% defoliation from insect infestations in Stoneville, MS during 2017. However, we were able to establish enough defoliation to determine the relationship between insect defoliation and peanut yields. Based on the regression analysis, insect defoliation occurring between late pegging and early pod fill resulted in a reduction of 15.3 lbs of peanuts per acre for every 1% increase in defoliation (Fig. 2). A more comprehensive analysis will be conducted when all of the yield data have been collected.

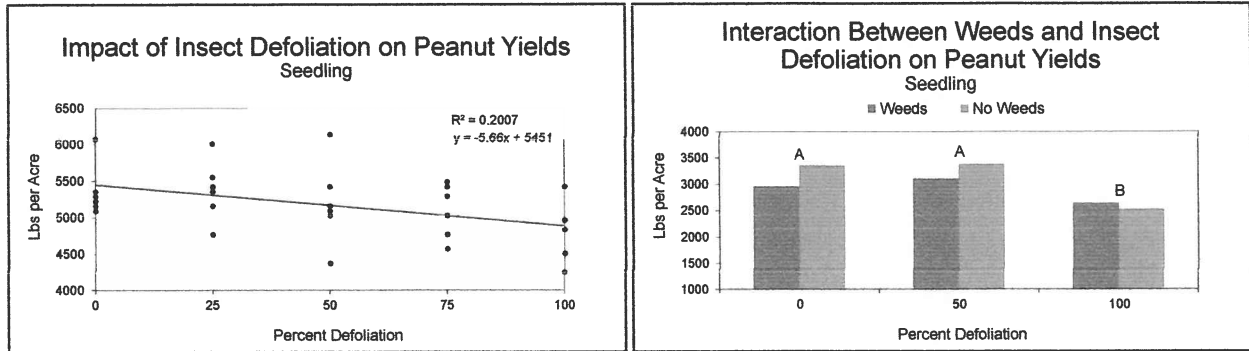


Figure 1. Impact of defoliation on peanut yields during the seedling stage (approximately 15-25 days after emergence), and in the presence of grassy weeds in Stoneville, MS in 2017.

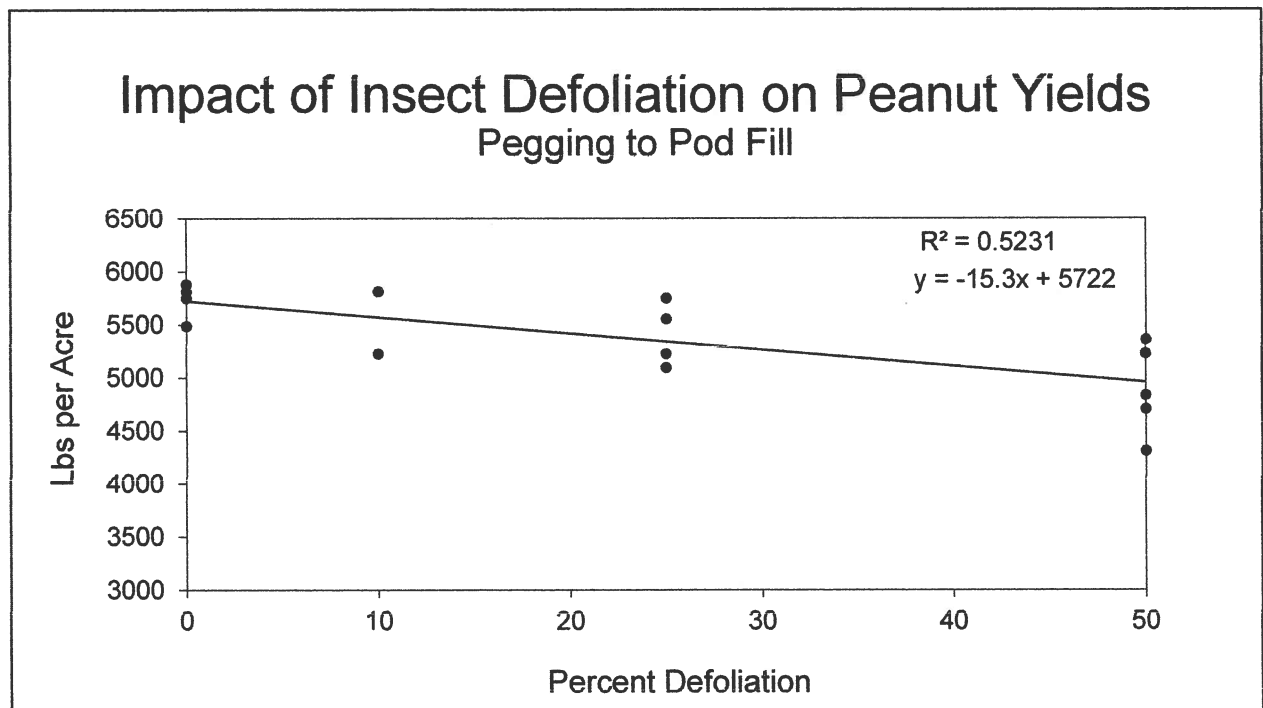


Figure 2. Impact of actual insect defoliation on peanut yields from pegging to pod fill in Stoneville, MS during 2017.

**Objective 2.** An experiment was conducted to determine the efficacy of various insecticides against defoliating caterpillars in peanut. Plot was sprayed with tractor mounted boom calibrated to deliver 15 GPA. Plots were sampled at 7, 14, 21, and 28 days after treatment (DAT) by counting the number of larvae per 6 row ft. At 7 DAT, all treatments significantly reduced the number of bollworms compared to untreated control (Table 1). No differences were observed among insecticide treatments. Bollworm populations declined to near zero by 14 DAT and no differences were observed. For fall armyworm, All of the insecticide treatments reduced larval numbers compared to the untreated control at 7, 14, and 21 DAT. No differences were observed among insecticide treatments at 7 DAT. In contrast, the Prevathon and Diamond treatments had significantly fewer larvae than Steward and Intrepid Edge at 4 oz. No differences were observed in peanut yields.

Table 1. Efficacy of various insecticides against bollworm and fall armyworm in peanut in Stoneville, MS.

Insecticide	Rate (oz/A)	Bollworm/6ft		Fall Armyworm/6ft				Yield (Lbs/A)
		7 DAT	14 DAT	7 DAT	14 DAT	21 DAT	28 DAT	
Intrepid Edge	4.0	1.7b	0.0a	1.3b	1.1b	2.4b	0.2a	5254a
Intrepid Edge	5.0	0.7b	0.3a	0.5b	0.4bc	0.4bc	0.0a	4645a
Intrepid Edge	6.0	0.4b	0.0a	0.3b	0.4bc	0.8bc	0.0a	4570a
Steward	9.0	0.0b	0.0a	1.3b	1.1b	2.4b	0.4a	4542a
Prevathon	14.0	0.6b	0.3a	0.0b	0.0c	0.0c	0.0a	4662a
Diamond	6.0	1.7b	0.5a	0.0b	0.0c	0.0c	0.0a	4746a
Untreated	---	6.0a	0.0a	11.5a	5.2a	11.7a	3.4	4634a