



Mississippi Corn Promotion Board 2018 Progress Report

Project

Title: Early Season Management of Stink Bugs in Field Corn

PI: Dr. Don Cook, Dr. Angus Catchot, Dr. Jeff Gore

Department: Biochemistry, Molecular Biology, Entomology, and Plant Pathology

Project Summary (Issue/Response)



Substantial numbers of commercial corn fields experienced infestations of stink bugs during the vegetative growth stages in 2017, with sporadic infestations occurring during 2018. The current treatment threshold is 10% infested plants; however, it is unclear how this threshold translates to percent damaged plants which ultimately impacts yield. Also, in many fields visual damage symptomology was observed even when scouting did not detect stink bug infestations. This indicates that current scouting methods may not reliably detect infestations. Previous research conducted in Kentucky and Indiana demonstrated that stink bugs (primarily brown stink bug and related species) are capable of injuring corn during the vegetative stages. Damage, including plant death (deadheart), reduced plant growth, and tillering, was more severe at earlier growth stages (VE and V2) than at later growth stages. Significant yield reductions were also observed. During 2018, seven small plot experiments were conducted at the Delta Research and Extension Center along with four locations of two on-farm experiments in the Mississippi Delta. The small plot experiments were to evaluate the effects of simulated stink bug damage during the early vegetative stage (V1, V2, and V3) on field corn yield. The yield results for these experiments were variable and no significant yield reductions were observed. The methodology for these types of experiments will be further refined for 2019. Two experiments were conducted in four commercial corn fields at several locations to evaluate the impact of damage from natural stink bug infestations on corn yield. Fifty paired plants and twenty 10' sections (to allow yield to be converted to a per acre basis) were marked at each location. Plant damage for paired plant experiment was rated on a 0-3 scale with 0 representing no visible damage, 1 representing the characteristic holes in a line across the leaf and/or leaf streaking, 2 representing line(s) of holes across leaves, leaf streaking, with plant stunting, and 3 representing "dead heart" (whorl death and tiller formation) or plant death. Each pair of plants consisted of a damaged plant that was given a damage rating based on visible symptomology and an adjacent non-damaged plant. For the twenty 10' sections damage severity was not determined. Sections representing 0, 10, 20, 30, and 40% damaged plants were established. Scouting and detection of stink bug infestations in vegetative stage corn has been problematic. Several scouting methods were evaluated including visual scouting and sticky card intercept traps.



Project Results/Outcomes

Plant damage with leaf streaking symptomology resulted in a significant yield reduction compared the non-damaged control (Figure 1). As damage severity increased, additional significant yield reductions were observed. Some plants with a damage symptoms of tillering / deadheart produce any yield. For the 10 row ft sections trials, all levels of damaged plants resulted in significantly lower yields than the non-damaged control (Figure 2). Stink bug damage to 10% of plants resulted in a 9.1% yield reduction. Damage to $\geq 20\%$ of plants resulted in ca. 17% yield reduction. Scouting and detection of stink bug infestations in vegetative stage corn has been problematic. Several scouting methods were evaluated including visual scouting and sticky card intercept traps. These methods were not effective at detecting stink bugs in or near corn fields. An observation of stink bugs congregating around light (at gas stations and other structures) prompted in deploying sticky card intercept traps with a light source attached around corn field at dusk. This method was also ineffective. An inexpensive flight intercept trap that has been utilized by other researchers will be evaluated during 2019.

Project Results

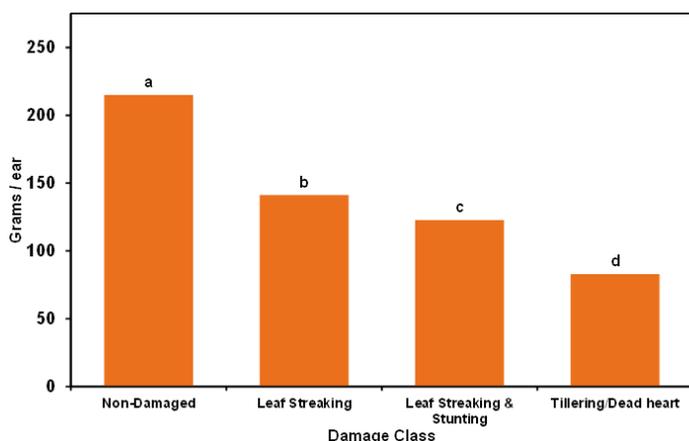


Figure 1. Impact of brown stink bug damage of varying severity on yield of individual corn plants.

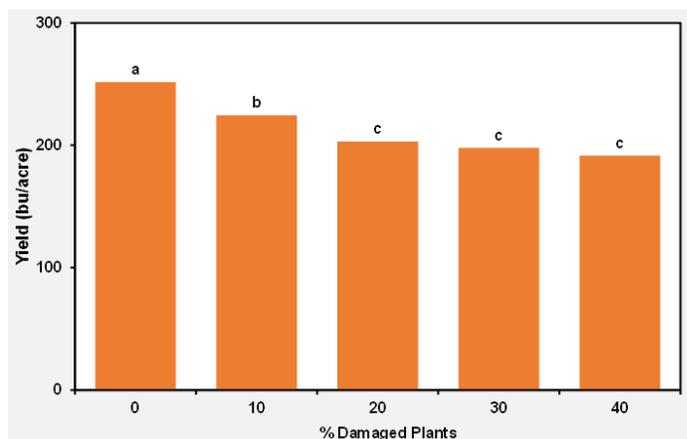


Figure 2. Impact of various levels (percent damaged plants) of brown stink bug damage on corn yield.

Project Impacts/Benefits

These results are preliminary, but demonstrate the impact of stink bug injury on corn yield and give an indication of the amount of yield loss that can occur at varying percentages of stink bug damaged plants. These results also demonstrate the degree or intensity of injury has a dramatic influence on the amount of yield loss that can occur.

Project Deliverables

To date, these results have been presented at the 2018 MSU Row Crop Short Course and in the graduate student competition at the 2019 Beltwide Cotton Conferences. Additional presentations of the results are anticipated.