



Mississippi Corn Promotion Board 2019 Progress Report

Project

Title: Management of Stored Grain Insect Pests of Field Corn

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Project Summary (Issue/Response)

The increase in corn production and grain production in general has also resulted in an increase in on-farm grain storage. Numerous insects can infest stored grain in MS. Many of these are beetle and weevil species, but several caterpillars can also infest stored grain. The risk of insect infestations when storing grain on-farm can vary depending on the level of site and grain bin sanitation, the length of grain storage, and the use of preventative treatments including insecticide application to the empty grain bin and/or insecticide grain protectants (applied directly to the grain). Typically, the risk of infestation/damage is relatively low with short term grain storage (till late winter/early spring). However, if winter conditions are mild insects that infest stored grain could remain active. Also, some producers are holding grain for longer periods of time for marketing purposes. The longer grain is stored, the greater the risk of insect infestations. Currently, little to no research is being conducted on stored grain insect pests in Mississippi or the Mid-South. Studies were conducted during 2019 to evaluate empty bin insecticide treatments and grain protectants against insect pests infesting stored field corn.



Project Results/Outcomes



There were no differences in maize weevil densities among treatments for samples collected during Nov 2018 to Jun 2019, even though plots were infested multiple times (Figure 1). It is possible that the location where the trial was stored (equipment shed under where tractors and sprayers were kept) influenced establishment of insect infestations. As a result of this possibility, the trial was moved during early Jul to another site, where spray equipment was not stored. For the Jul, Aug, and Sep samples, Actellic and Sensat reduced weevil densities compared to Tempo, Malathion, and the untreated control. Actellic and Sensat resulted in lower weevil densities than Tempo and the untreated control at the Oct sample timing. Across all treatments, mean maize weevil densities only exceed 1 per sample in samples after 1 Jun 2019. Other insect pests, including red flower beetle, sawtoothed grain beetle, sap beetles, Indian meal moth, and Angoumois grain moth, were observed sporadically. There were no differences among treatments for total pest insects for samples collected during Nov 2018 to Jun 2019 (Figure 2). Plots treated with Actellic, Sensat, or Suspend had fewer total insect pests than plots treated with Tempo or the untreated plots for the July sample. For the Aug sample, Actellic and Sensat resulted in fewer total insect pests compared to all other treatments. Also, Suspend resulted in fewer total insect pests compared to Tempo, Malathion, and the untreated control. When plots were sampled during Sep and Oct, Actellic and Sensat resulted in fewer total insect pests compare to Tempo, Malathion, and the untreated control. After one year of sampling (the Oct 2019 sample), only the Actellic, Sensat, and untreated plots were selected for continued sampling. This was because all of the other insecticide treatments had not provided satisfactory control of insect pests for at least two consecutive sampling periods. During Nov 2019 through Jan 2020, both Actellic and Sensat reduced both maize weevil and total insect pest densities below that in the untreated plots, with no maize weevils captured in the treated plots.

Project Results

Figure 1. Impact of stored grain insect pest management on maize weevil densities during Nov 2018 to Jan 2020.

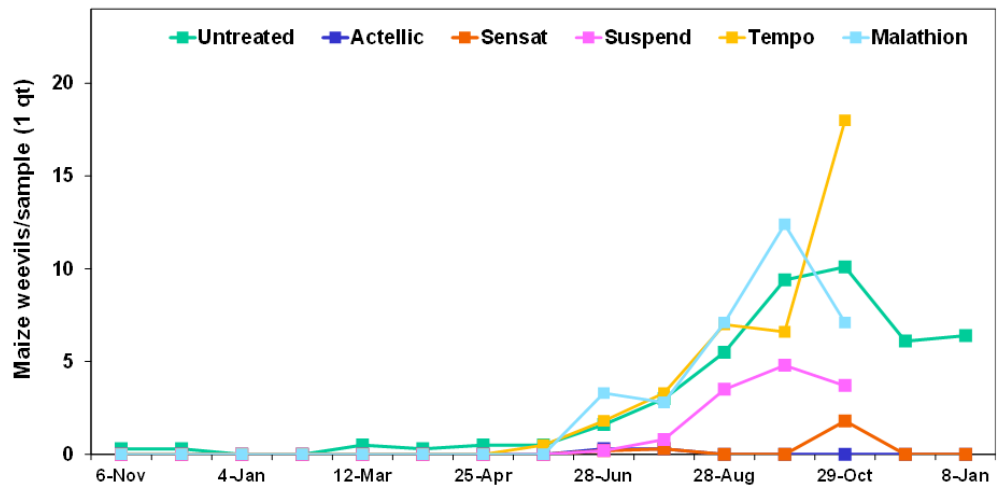
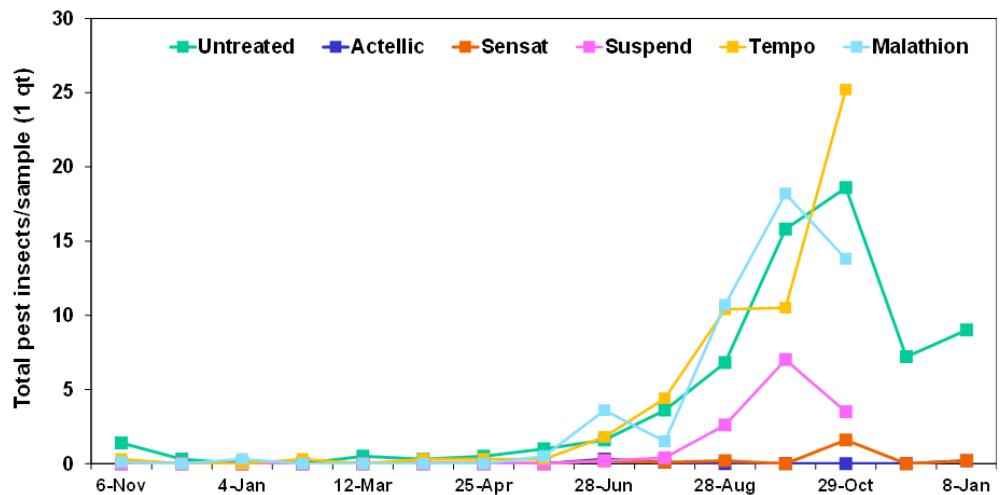


Figure 2. Impact of stored grain insect pest management on total pest insect densities during Nov 2018 to Jan 2020.



Project Impacts/Benefits

These studies demonstrate the performance of stored grain insect management tools under Mississippi conditions. As growers store grain for longer periods of time, information from these studies will be to assist them in managing insect pests to preserve the value of stored grain.

Project Deliverables

Currently the results have been presented at the 2019 MSU Seed Technology Short Course and will be presented at the 2020 Mississippi Agricultural Consultants Association annual meeting. Results have also been shared with some consultants (upon request) to aid in management decisions for stored grain insect pests.