



Mississippi Corn Promotion Board 2024 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 Mississippi. 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 research is being conducted on stored grain insect pests in Mississippi or the Mid-South.



Project Results/Outcomes

Grain temperature among treatments was similar during Feb to Jun and Aug. During Jul Actellic and Diacon IGR Plus + PBO resulted in lower grain temperature than the untreated control. During Sep and Oct none of the insecticides resulted in lower grain temperature than the untreated control. During Nov all of the insecticide treatments, except Diacon IGR Plus, Tempo, and Malathion, resulted in lower grain temperatures compare to the untreated control. No differences among treatments were observed for grain moisture, except during Sep. However, none of the insecticides resulted in lower grain moisture content compared to the untreated control during Sep. Maize/rice weevil densities were low during Feb through Apr (0 per sample) (Figure 1). During Jun weevil densities exceeded 1 per sample in the Diacon IGR Plus and Tempo, and Malathion treated drums. All of the other insecticides resulted in <1 weevil per sample. During Jul weevil densities exceed 2.5 per sample in drums treated with Diacon IGR Plus and Tempo treated barrels and the untreated barrels. During Aug weevil densities in the untreated drums and those treated with Diacon IGR Plus, Tempo or Malathion exceeded 9.5 weevils per sample. All of the other insecticides resulted in ≤ 2 weevil per sample. During Sep only aluminum phosphide fumigation maintained weevil densities below 1 per sample. Weevil densities in barrels treated with Actellic or Sensat were <2 per sample. During Oct and Nov only aluminum phosphide maintained weevil densities below 1.5 per sample. The addition of the insecticide synergist PBO (piperonyl butoxide) to Diacon IGR Plus (deltamethrin + methoprene) substantially improved performance. Maize/rice weevils were the most common insect pests observed. Densities of total insect pests generally followed similar trends as those observed for weevils. Large numbers of sap beetles were observed in the barrels that received the empty bin treatments of Tempo or Malathion.

Project Results

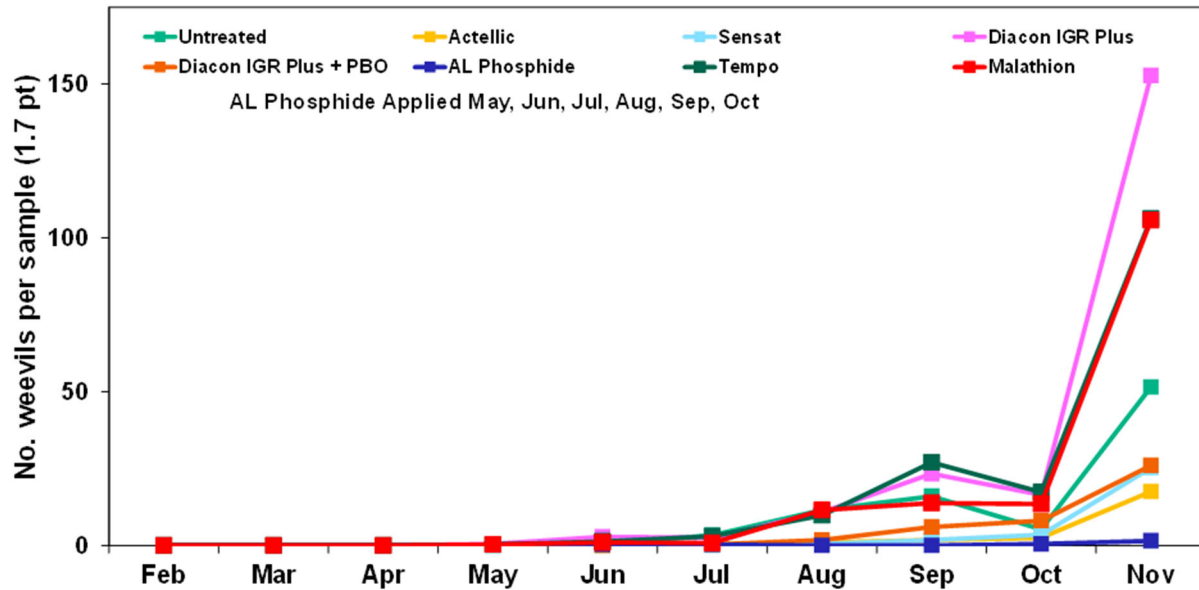


Figure 1. Impact of selected stored grain insect pest management on maize/rice weevil densities during Feb to Nov 2024. This trial was initiated during Dec 2023.

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

Results have been presented at locally at grower and consultant meetings, regionally and nationally. Result from the studies have also been used to develop the stored grain insect management recommendations section included in the 2025 Insect Control Guide for Agronomic Crops.