



Mississippi Corn Promotion Board 2021 Progress Report

Project Title: Management of Stored Grain Insect Pests of Field Corn

PI: Don Cook, Jeff Gore, Angus Catchot, Whitney Crow

Department: Delta Research and Extension Center

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.



Studies were conducted during 2020 to evaluate grain protectants against insect pests infesting stored field corn. These included Actellic (pirimiphos-methyl), Sensat (spinosad), Suspend (deltamethrin), Diacon IGR (methoprine), Diacon IGR Plus (methoprine plus deltamethrin), and an untreated control. Following the Aug 2020 sample, the Diacon IGR plots were fumigated with aluminum phosphide. This trial was terminated in Apr 2021 because the grain got had begun to mold. Grain moisture in this trial had increased from Nov 2020 until Apr 2021, possibly due to insect infestations and weather conditions.

The 2021 trial was set up during Jan 2021 due to issues in obtaining plastic drum to store the grain. Treatments included Actellic (pirimiphos-methyl), Sensat (spinosad), Suspend (deltamethrin), aluminum phosphide, Diacon IGR Plus (methoprine plus deltamethrin), and an untreated control. The aluminum phosphide plots were fumigated ca. monthly following the May, Jun, Jul, Aug, and Sep sample dates.

Project Results/Outcomes

For the 2020 trial, only Actellic maintained weevil densities below two per sample from Jan to Oct 2020 (Figure 2). Weevil densities in the Aug samples for the Suspend, Diacon IGR, and Diacon IGR Plus treated plots exceeded 20 per sample. On 6 Aug the Diacon IGR plots were fumigated with aluminum phosphide pellets. Following fumigation weevil densities were ≤ 1.5 per sample for the Sep and Oct samples. For the remainder of the trial (Nov 2020 – Apr 2021) only the Diacon IGR plots that were fumigated with aluminum phosphide in Aug 2020 had fewer than 20 weevils per sample on any sample date. Weevil densities peak in Dec 2020, with >160 weevils per sample in the Suspend, Diacon IGR Plus and untreated plots. Weevil densities in the Actellic and Sensat plots were 45 and 24 per sample, respectively. Insect pest densities declined during Jan through Apr 2021, especially after the cold weather event during Feb.

For the 2021 trial, weevil densities were low during Mar through Jun (<5 per sample). During Jul weevil densities were >9 per sample in the Suspend, Diacon IGR plus, and untreated plots. During Aug only Actellic and Aluminum phosphide maintained weevil densities below 9 per sample. In the Sep and Oct samples, weevil densities exceeded 25 per sample in all plots, except those that received aluminum phosphide fumigation.

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.

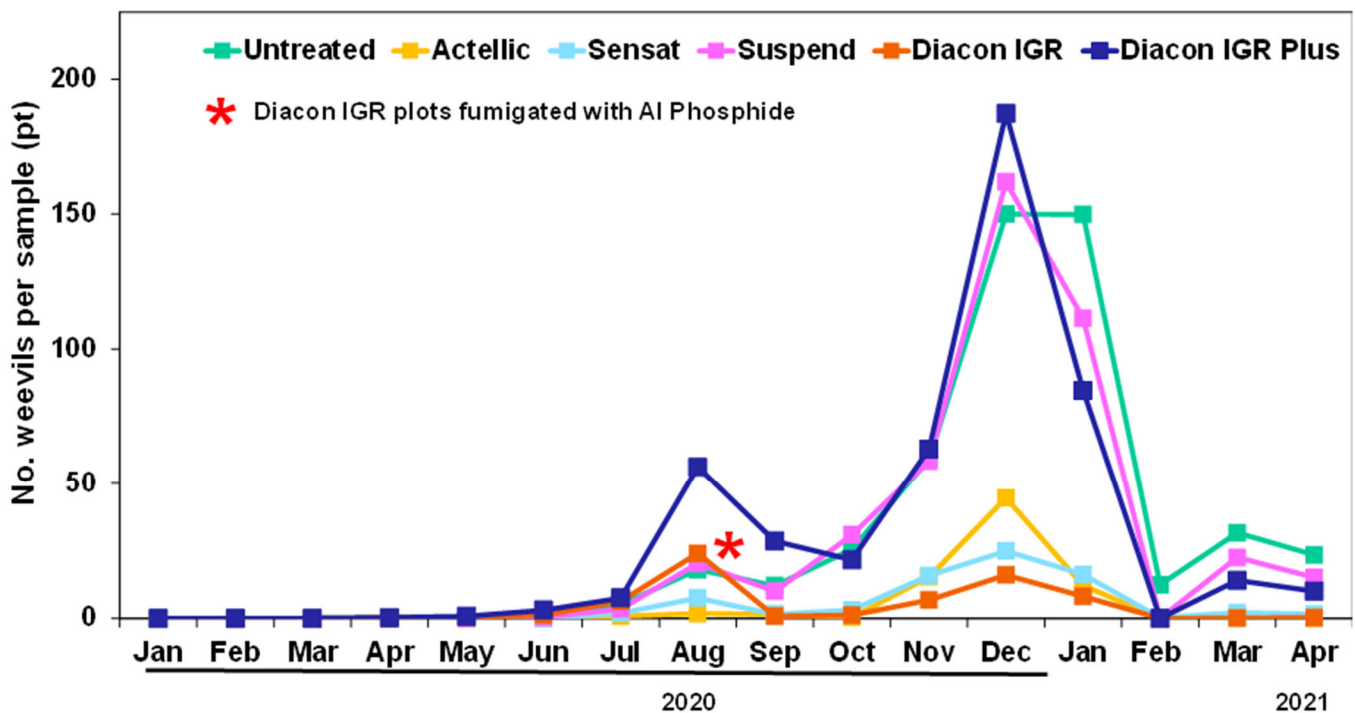


Figure 1. Impact of selected stored grain insect pest management on maize/rice weevil densities during Jan 2020 to Apr 2021. This trial was initiated during Nov 2019.

Project Impacts/Benefits

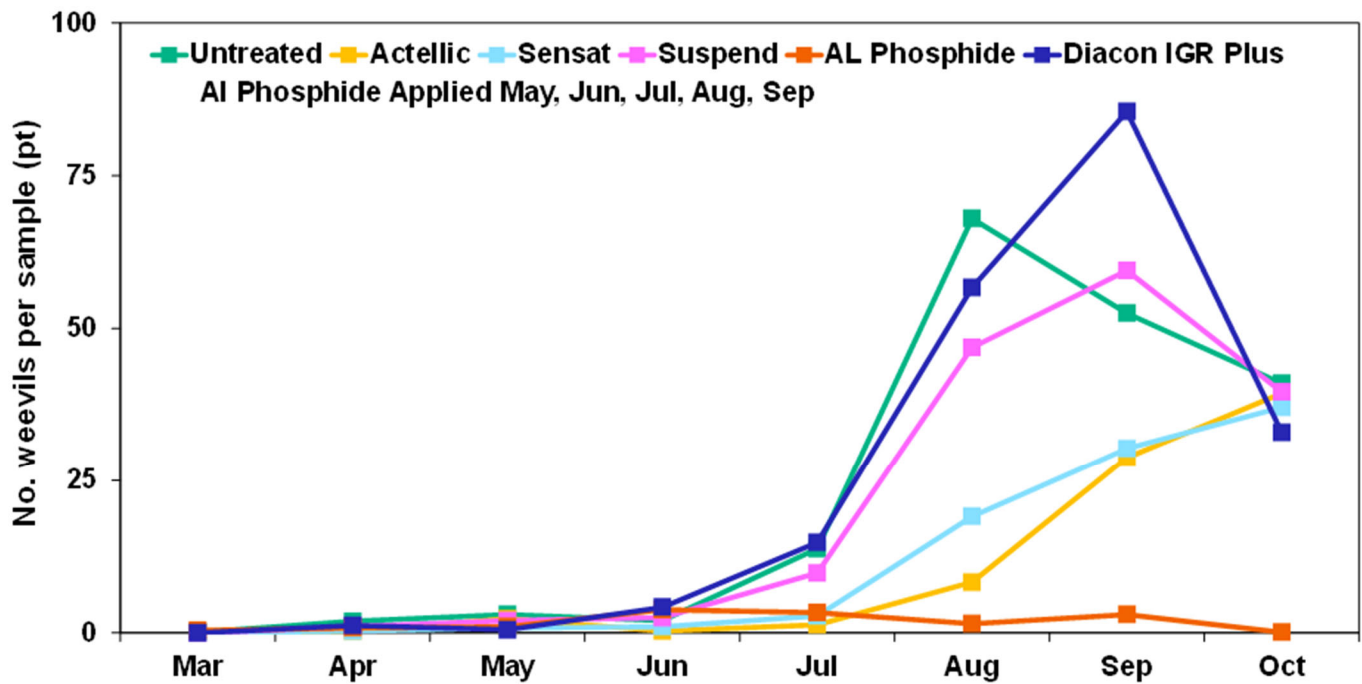


Figure 2. Impact of stored grain insect pest management on maize weevil densities during Mar to Oct 2021. This trial was initiated during Jan 2021.

Project Deliverables

Results have also been shared with consultants and growers to aid in management decisions for stored grain insect pests.