

Applied Research Report

Evaluation of Corn Leaf Aphid in Corn - 2024

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Summary

Corn leaf aphid has long been found in corn and sorghum fields of Texas, but in 2024, aphid populations greatly exceeded the levels found in recent years. A trial was conducted to evaluate the insecticide bifenthrin and to determine the effect of the aphid on corn production. Treatment with bifenthrin did not significantly reduce the aphid population and, if this result is repeatable, bifenthrin would not be considered an effective insecticide for corn leaf aphid control in corn. The comparison of uninfested and infested plants showed surprising results. The average kernel weight of infested plants was 71.13 g less per ear than uninfested plants: a 43.9% reduction in grain weight per ear. Further research should be conducted to evaluate insecticidal control of corn leaf aphid and investigating the economic threshold of corn leaf aphids and effects of the timing of infestation in corn production.

Introduction

The Texas AgriLife Extension Publication “Managing Insect and Mite Pests of Texas Sorghum” describes corn leaf aphids (*Rhopalosiphum maidis*) as “oval and dark bluish green aphid with black antennae, cornicles, and legs (Figure 1). There are winged and wingless forms.” The guide further states: “Corn leaf aphids rarely cause economic loss to sorghum. In fact, they can be considered helpful because they attract beneficial insects such as lady beetles, which feed on the aphids.”



Figure 1. Corn Leaf Aphid. Photo by Jason Thomas

In the Texas AgriLife Extension Publication “Managing Insect and Mite Pests of Texas Corn,” the corn leaf aphid is not thought to be very important. This guide states “Pre-tassel and later growth stages can tolerate large numbers of aphids without economic damage.”

On May 2, 2024, a corn grower near Port Lavaca, TX contacted the local Extension Agent – IPM. The grower had corn leaf aphids in his corn fields at levels well above normal. The Agent surveyed corn fields in the area and found most fields had 3-15% of the plants with high numbers of corn leaf aphids. Most of these fields were silking and shedding pollen (R1).

A field was located with tasseling corn plants (VT) having 10-15% of the plants had over 1,500 aphids per leaf on the leaves above the ear. In addition, 3-5 late instar larvae of the Scymnus lady beetle were found on most plants and approximately 10% of the aphids appeared to be parasitized. This field was chosen as the study field for the field trials.



Figure 2. Corn Leaf Aphids on Corn Plants. Photo by Stephen Biles

Objective

A trial was initiated with the primary goal to evaluate the insecticide bifenthrin for control of corn leaf aphids in corn. A secondary goal of the field study was to examine the effect of the corn leaf aphid on the yield of infested corn plants.

Materials and Methods

A trial was set up with one treatment of Brigade 2 EC (bifenthrin) at 6.4 oz/A and an untreated treatment with three replications. The plots were two rows wide with two buffer rows between plots. Plot length was 40 feet. Row spacing was 38 inches.

In each plot, 10 aphid infested plants were marked using yellow surveyor's tape. The number of aphids per leaf on each of the 10 aphid infested plants was counted prior to treatment and again at 2 and 4 days after treatment (DAT). The average number of aphids per leaf were calculated across the 10 plants.

Applications were made above the crop using a handheld spray-boom using TT11002 spray tips at 30 psi. The application volume was 18.7 gallons per acre.

After the 4 DAT counts, 10 corn plants that did not have evidence of aphid infestation were in each of the plots and red surveyors' tape was used to mark the ears. When the crop was

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mature for harvest, the ears from each plot were removed and weighed, then shelled and the grain and cob weights were measured.

During the trial period, a large part of the trial area was run over by farm equipment causing the loss of some of the marked ears. Thus, yield results are reported by averaging the ears within each plot; infested and uninfested.

Results and Discussion

Treated and untreated plots averaged 1726.7 and 2413.3 aphids per leaf at 2 DAT and 193.7 and 555.9 aphids per leaf at 4 DAT (Table 1). The drastic reduction in aphid numbers in untreated plots during the test demonstrated the value of beneficial insects on the aphid population.

The number of corn leaf aphids in the bifenthrin treated plots was not different from untreated plots, the numerical difference may indicate “suppression” and not control of the aphids. If this result can be repeated, bifenthrin would not be recommended for control of the corn leaf aphid.

The comparison of uninfested and infested plants showed surprising results (Table 2). The average kernel weight of infested plants was 71.13 g less per ear than uninfested plants: a 43.9% reduction in grain weight per ear. Average ear weight and cob weight were not different.

Conclusions

The objectives were to evaluate bifenthrin for control of corn leaf aphid and to learn what effect the high aphid numbers had on the corn crop. The bifenthrin did not adequately control the aphids when compared to the untreated check. In the second objective, the large populations of corn leaf aphid reduced the grain yield significantly. Further research should be conducted to evaluate insecticidal control of corn leaf aphid and investigating the economic threshold of corn leaf aphids and effects of the timing of infestation in corn production.

Several important observations were made during the study of the corn leaf aphids. First, the aphids were tightly clumped and colonized a small percentage of the plants instead of colonizing all the plants. Even in parts of a field with heavy populations only 30-40% of the



Figure 3. Corn Leaf Aphids and Beneficial Insects. Photo by Stephen Biles.

plants had aphids. The other plants had very few aphids. Within a row, a scout would find 2-3 plants with over 1000 aphids per leaf and the next 3-4 plants with less than 20 aphids per plant.

Second, it is important to recognize the aphids had been in the field for at least 2-3 weeks prior to their discovery on May 2, 2024. This can be deduced from the presence of older lady beetle larvae and parasitized aphids.

In South Texas, most corn fields are not scouted for insects after the first few weeks from emergence. In 2024, it was an agronomist who initially discovered the problem while looking for bloom dates of a hybrid test. In future corn production seasons, the fields need to be monitored for aphids, at least through pollination.

Acknowledgements

Thanks to Ryon Gossett for allowing the field research to be conducted in his corn field. Without such cooperation, much of what we do at the Texas A&M AgriLife Extension Service would not be possible.

Table 1. Corn leaf aphids per leaf in the bifenthrin and untreated plots at 2 and 4 days after treatment. (Calhoun County, TX, 2024).

| | | 5/4/2024 | 5/6/2024 |
|--------------------|---------------------|----------|----------|
| | | 2 DA-A | 4 DA-A |
| 1 | Bifenthrin 6.4 oz/a | 1726.7 - | 193.7 - |
| 2 | Untreated Check | 2413.3 - | 555.9 - |
| LSD P=.05 | | 1286.33 | 982.8 |
| Standard Deviation | | 366.15 | 279.75 |
| CV | | 17.69 | 74.64 |
| Replicate F | | 2.77 | 1.021 |
| Replicate Prob(F) | | 0.2652 | 0.4947 |
| Treatment F | | 5.275 | 2.515 |
| Treatment Prob(F) | | 0.1485 | 0.2536 |

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

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Table 2. Comparison of uninfested and infested corn ears measuring the average weight of the ear, kernels and cob in grams per ear at harvest time. (Calhoun County, TX, 2024).

| | 7/18/2024 | | 7/18/2024 | | 7/18/2024 |
|--------------------|------------|---|---------------|---|------------|
| | Ear Wt (g) | | Kernel Wt (g) | | Cob wt (g) |
| 1 Uninfested | 190.73 | - | 162.03 | a | 27.85 - |
| 2 Infested | 113.62 | - | 90.90 | b | 22.13 - |
| LSD P=.05 | 77.58 | | 66.43 | | 11.20 |
| Standard Deviation | 34.22 | | 29.30 | | 4.94 |
| CV | 22.49 | | 23.17 | | 19.77 |
| Treatment F | 7.614 | | 8.839 | | 2.012 |
| Treatment Prob(F) | 0.0509 | | 0.041 | | 0.229 |

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).