

Kansas Agricultural Experiment Station Research Reports

Volume 9
Issue 6 *Western Kansas Agricultural Research*

Article 7

2023

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Recommended Citation

Zukoff, Anthony (2023) "Observations on the Seasonal Abundance of Sorghum Midge," *Kansas Agricultural Experiment Station Research Reports*: Vol. 9: Iss. 6. <https://doi.org/10.4148/2378-5977.8491>

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Observations on the Seasonal Abundance of Sorghum Midge

A. Zukoff

Summary

Sorghum midge, *Stenodiplosis sorghicola* (Coquillett), is a major pest of sorghum production worldwide. Midge larvae develop within the sorghum spikelet protected from predation and chemical control. Feeding by larvae prevents grain development resulting in varying degrees of blank heads. Historically, sorghum midge has been considered a minor pest in Kansas. In recent years, significant midge infestations have been documented in several locations of the southwest and southeast portions of the state. Some basic information on sorghum midge seasonality in Kansas will help to refine some management recommendations if this pest becomes more prevalent. Sorghum midges were recovered from samples taken every week of this study. Samples collected during the first week of August contained the lowest number of midges while the highest number of midges recovered came from samples collected on August 15. The percent of samples infested was lowest on August 8 at 40%. Infestation across the remainder of the study ranged from 60 to 100%.

Procedures

This study was conducted in sorghum plots at the Southwest Research and Extension Center in Finney County during the 2022 growing season. Three successive biweekly plantings of sorghum were made beginning in early June so that flowering sorghum was available as late into the season as possible. However, severe drought conditions prevented observations beyond the third week of September.

The seasonal abundance of sorghum midges was monitored in field samples of naturally infested sorghum panicles. Weekly, once flowering began, five panicles at 50% bloom were randomly selected and marked with high visibility flagging tape. From these panicles, any spikelets not in bloom were removed. The panicles were left undisturbed for seven days and then were caged with cotton bags (12 × 8 inches). The cages were equipped with drawstrings to allow the opening to be tightly sealed around the flowering stalk. A zip tie was also used to ensure that arthropods could not escape the cage. On day 14 following the onset of flowering, caged panicles were cut from the plants and brought back to the lab for storage. On day 45, cages were removed from the panicles. Each panicle was shaken in a small container to dislodge any insects that may have remained. These materials along with all of the material from the cage were hand sorted under a stereoscope to identify and count sorghum midges. Weekly means and percent infestation were calculated from midge densities.

Results and Discussion

A total of 158 sorghum midges were recovered from samples taken over a period of 7 weeks. The average number of midges recovered from panicles during the first week of sampling was 2.6. Infestation levels increased during the second week of sampling to 11.6 midges per panicle when 80% of samples were observed to be infested. The average number of midges dropped quickly on August 22 to 2.4 midges per panicle. The number of midges remained low for the duration of the study (Figure 1). The percent of samples infested doubled between August 8 and August 15 and remained high throughout the season even if midge counts were low. On September 19, 100% of samples were infested with sorghum midge (Figure 2).

Overall, sorghum midge pressure during the 2022 growing season was low and no notable outbreaks were reported. It is possible that the drought conditions helped to suppress any significant population growth. Sorghum midges are weak fliers and delicate insects with life spans of a day or less under field conditions. The hot, windy weather conditions may have prevented egg laying. Hot and dry weather is also known to cause midge larvae to enter a state of diapause, forming a protective cocoon in order to survive adverse conditions. These cocoons can remain dormant for up to 3 years until conditions are favorable (Walter, 1941).

Sorghum midge can be a challenging pest. The only controllable life stage is the adult, which requires frequent and appropriately timed scouting. If chemical control is used, follow-up applications are usually needed and daily scouting must continue until sorghum flowering is complete. One effective cultural control of this pest is to plant fields as early as appropriate and follow practices that ensure uniform flowering across the field. Fields flowering early in the season are able to avoid the larger, more damaging midge populations typically present later on. Data from this study, along with data from future efforts, will aid in understanding sorghum midge seasonality in Kansas. Planting date recommendations can eventually be refined in order to avoid significant losses from this pest if it becomes a more frequent problem in the state.

Acknowledgments

I appreciate Patrick Geier, Southwest Research and Extension Center, for his assistance planting the plots used in this study.

References

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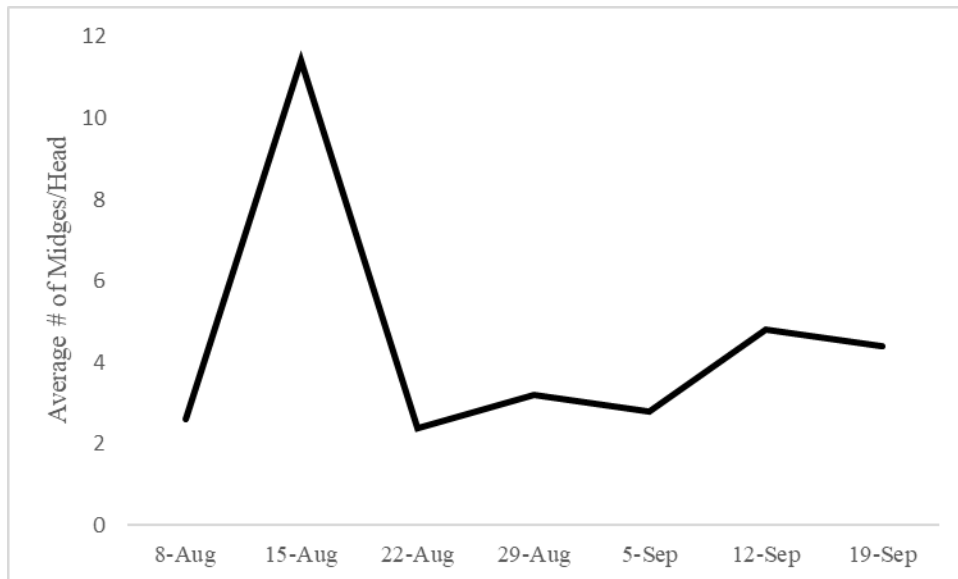


Figure 1. Seasonal distribution of sorghum midges infesting plots in 2022.

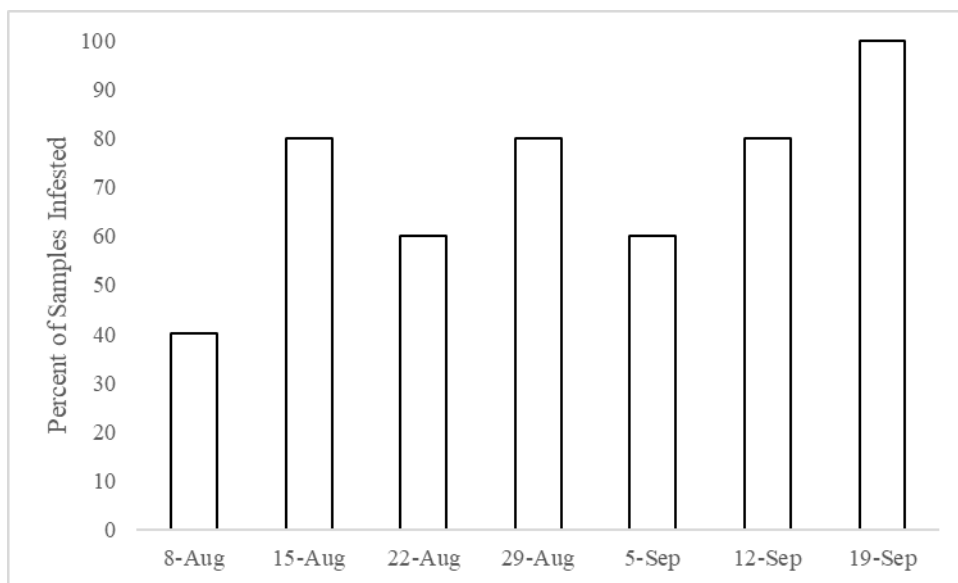


Figure 2. Weekly infestation levels by sorghum midge in samples taken from plots in 2022.