

KUDZU BUG: A NEW PEST IN MISSISSIPPI SOYBEANS?**B. McRight****Fred Musser****Angus Catchot****Nick Bateman****Mississippi State University****Starkville, MS****Jeff Gore****Don Cook****Mississippi State University****Stoneville, MS****Abstract**

Surveys were conducted to better understand the distribution of the kudzu bug, *Megacopta cribraria*, across the state of Mississippi, as well as determine the best control methods for this pest using insecticides that are common to soybean growers. The first objective was to determine the distribution of the kudzu bug based on maturity, soybean planting date, and region. We surveyed over two hundred locations across the state of Mississippi and number of kudzu bug adults and nymphs were recorded in the Hills and Delta regions in Mississippi. There were more kudzu bugs nymphs and adults in the Hills region than in the Delta region. More adults were found in soybean planted during April than in soybeans planted during May or June. The majority of the nymphs were found in soybean planted during June. Many commonly used insecticides provided sufficient control of kudzu bug. However, the two chemistries that provided the best control were bifenthrin and clothianidin. Both of these chemicals provided significant control up to seven days after application.

Introduction

Megacopta cribraria, commonly known as the kudzu bug, is a native of Southeast Asia. This pest is most often found feeding on the stems and petioles of legumes such as soybean and kudzu (Suiter et al. 2010). In 2012, the kudzu bug was first discovered in Mississippi, near the city of Vicksburg, adjacent to a major roadway (Catchot 2012). In recent years, this pest has become a common problem in soybean production systems across the state. The impact of the kudzu bug on soybeans in the mid-south is not fully understood at this time. First steps toward understanding this insect is knowing the distribution of the kudzu bug and effective control measures.

Materials and Methods

Insect surveys were conducted on over two hundred locations across both the Hills and Delta regions of Mississippi during the 2015 and 2016 growing seasons. One hundred sweeps were taken at each location starting at R1 growth stage through R7 growth stage. Both nymph and adult kudzu bugs were counted in this survey. At each location, the planting date of the field being surveyed was recorded along with the region of the state. All of the data recorded in this project were analyzed using PROC GLIMMIX SAS 9.4 with an alpha level of 0.05.

The efficacy of chemical control measures were evaluated using a randomized complete block design with four replications. This trial consisted of five treatments with each treatment being a different insecticide formulation, along with an untreated check. After the initial application of each formulation, all treatments were monitored for kudzu bugs at two, four, and seven days after application. Twenty-five sweeps were taken with a standard 15" sweep net from each plot to monitor kudzu bug numbers. All data from this trial were analyzed using PROC MIXED.

Results and Discussion

Significantly more kudzu bugs were found in soybean fields in the Hills region than in the Delta region (Figure 1). This was not surprising because there is generally more kudzu in the Hills region which serves as an alternate host. When looking at the distribution of this pest by planting date, significantly more adult kudzu bugs were observed in fields planted during April and May than there were nymphs. However, there was no significant difference in the number of adults and nymphs recorded in soybean planted during June (Figure 2). Significantly more kudzu bug adults were observed in the Hills region across all three planting dates than in the Delta region (Figure 3). For

nymphal distribution, there were significantly more nymphs in the Hills Region during the April and June planting dates, but there was no significant difference in the number of nymphs between the two regions during the May planting date (Figure 4).

All five insecticide treatments provided significantly better control of adult kudzu bugs than the untreated check. Clothianidin and bifenthrin provided significantly better control than all other treatments two days after application (Figure 5). Four days after application, all treatments still showed a significant difference in number of kudzu bug adults compared to the untreated check, but the clothianidin and bifenthrin again showed that they had the best efficacy against this pest (Figure 6). When the tests were rated for the last time, seven days after application, only three of the formulations showed a significant difference from the untreated check (Figure 7). Again, the pattern stayed the same and clothianidin and bifenthrin showed the best results with very few escapes a week after the application.

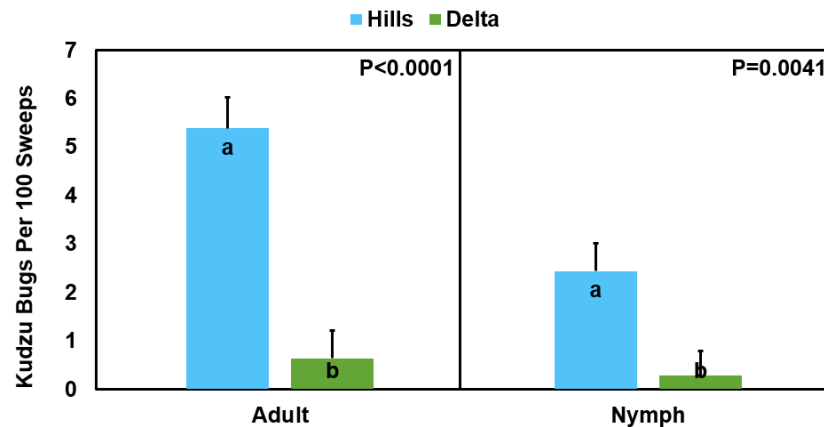


Figure 1. Mean number (+SEM) of kudzu bug adults and nymphs in soybeans from R1-R7 growth stages in the Hills and Delta regions of Mississippi during 2015 and 2016. Statistics compare the number of adults and nymphs within a region (Fishers Protected LSD test with $\alpha=0.05$).

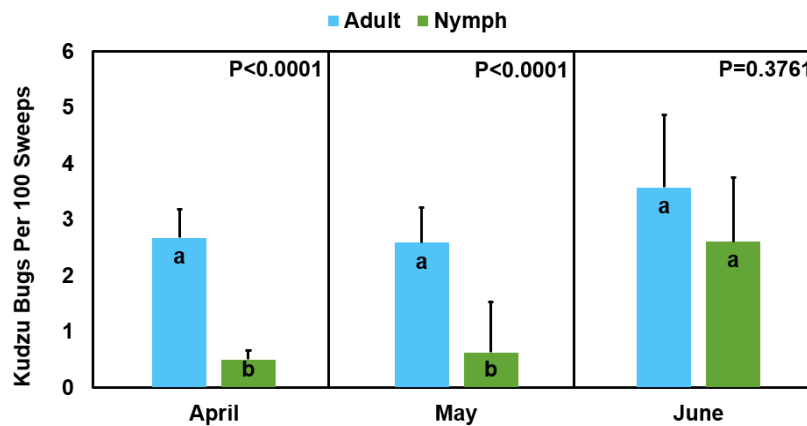


Figure 2. Mean number (+SEM) of kudzu bug adults and nymphs in soybeans from R1 – R7 growth stages in April, May, and June planting dates in the 2015 and 2016 growing seasons. Statistics compare the number of adults and nymphs within a planting date (Fishers Protected LSD test with $\alpha=0.05$).

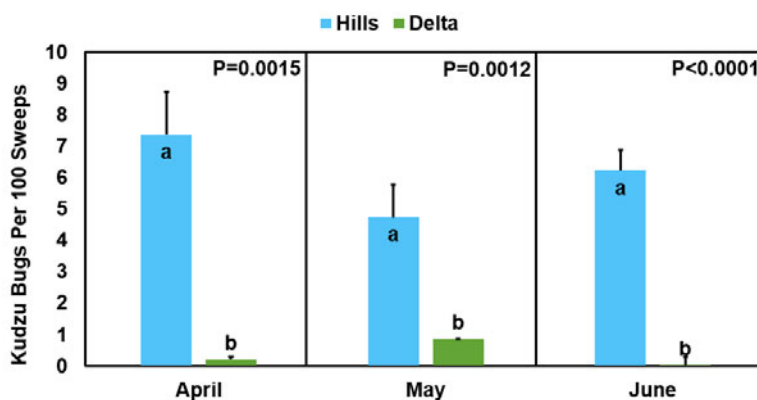


Figure 3. Mean number (+SEM) of kudzu bug adults in soybeans from R1 – R7 growth stages in the Hills and Delta Regions of Mississippi during April, May, and June planting dates in the 2015 and 2016 growing seasons (Fishers Protected LSD test with $\alpha=0.05$).

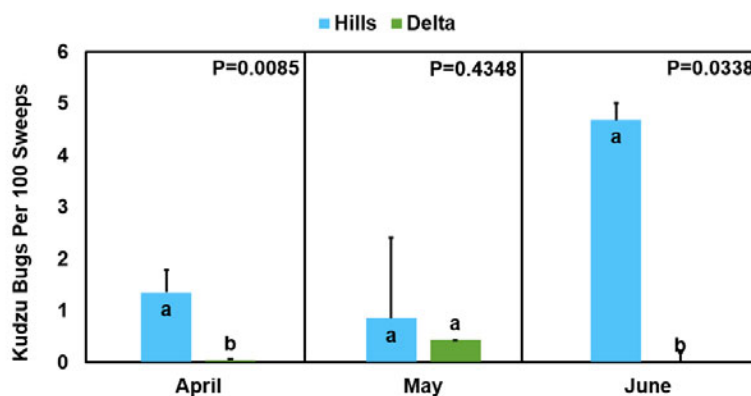


Figure 4. Mean number (+SEM) of kudzu bug nymphs in soybeans from R1 – R7 growth stages in the Hills and Delta Regions of Mississippi during April, May, and June planting dates in the 2015 and 2016 growing seasons (Fishers Protected LSD test with $\alpha=0.05$).

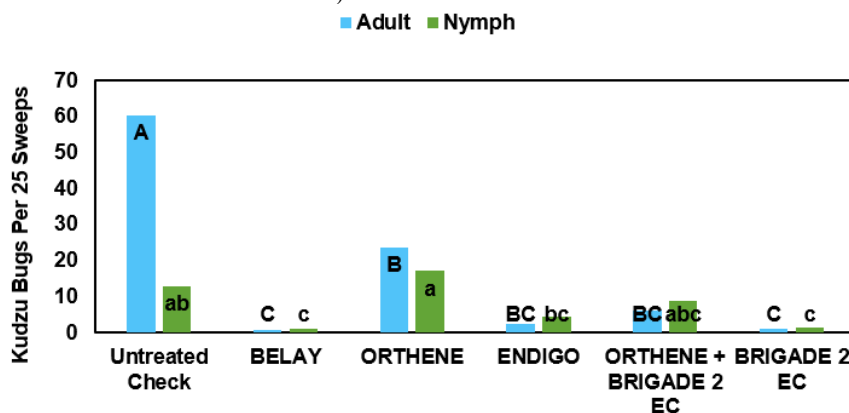


Figure 5. Kudzu bug adults and nymphs two days after insecticide application. Capital letter compare the number of adults among treatments while small letters compare the number of nymphs among treatments. Treatments with the same letter are not significantly different (Fishers Protected LSD test with $\alpha=0.05$).

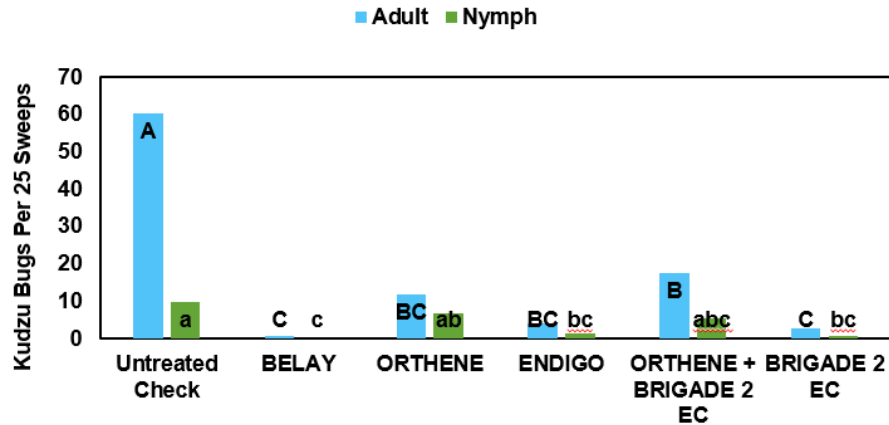


Figure 6. Kudzu bug adults and nymphs four days after insecticide application. Capital letter compare the number of adults among treatments while small letters compare the number of nymphs among treatments. Treatments with the same letter are not significantly different (Fishers Protected LSD test with $\alpha=0.05$).

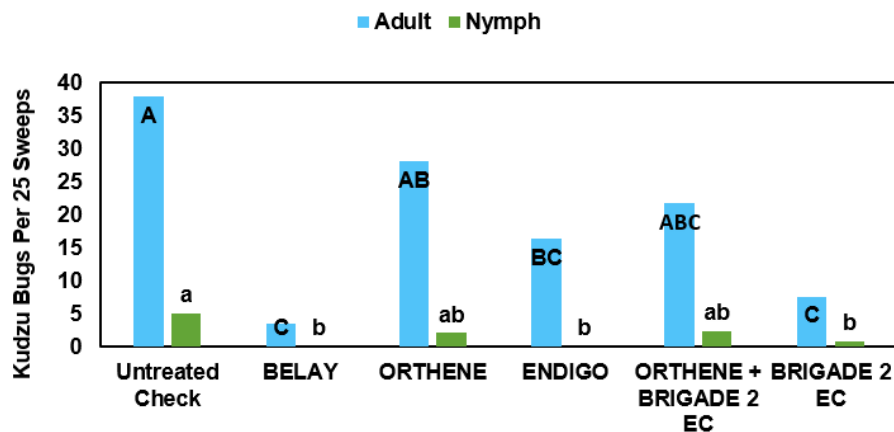


Figure 7. Kudzu bug adults and nymphs seven days after insecticide application. Capital letter compare the number of adults among treatments while small letters compare the number of nymphs among treatments. Treatments with the same letter are not significantly different (Fishers Protected LSD test with $\alpha=0.05$).

Summary

Overall, the Hills region, which has large areas of kudzu, had higher numbers of kudzu bug than the Delta region. Earlier planting dates had more adults than nymphs when compared to the later June planting dates. This is likely due to the fact that large population of migrating kudzu bugs were leaving overwintering before reproducing in later months. In the June planted soybeans, there was no significant difference in the number of adults and nymphs collected. Although there was no significant difference between them, the mean number of both adults and nymphs collected, increased in the June planted crops in the Hill region when compared to the April and May planting dates. Kudzu bugs appear to be easy to control using common insecticides currently utilized for other pest in Mississippi soybeans.

References

Catchot, A.L. 2012. First Findings of Kudzu Bugs in Mississippi. Mississippi-crops.com, <http://www.mississippi-crops.com/2012/07/18/first-findings-of-kudzu-bugs-in-mississippi/>

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