SPECIES COMPOSITION AND RELATIVE ABUNDANCE OF STINK BUGS IN THE BRAZOS RIVER BOTTOM – SECOND YEAR RESULTS

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Abstract

A study initiated in 2011 was repeated in 2012 to determine which stink bug species commonly infest cotton fields in the Brazos River Bottom (BRB) production area of Texas. Eight cotton fields throughout the BRB were sampled weekly with sweep nets from the 1st week of bloom until defoliation in 2012. Nearby corn, milo, and soybean fields were also sampled for stink bugs to determine whether these crops may be contributing stink bugs to cotton. Based on collections of adult stink bugs, 10 phytophagous species were collected among the four crops in 2012. Three species, *Euschistus servus* (Say), *Thyanta custator accerra* McAtee, and *Oebalus pugnax* (F.) were observed in all four crops. As in 2011, soybean fields contained the greatest diversity of stink bugs (10 species) in 2012 with *T. c. accerra* (43%) and *E. servus* (41%) being the two most prevalent species collected from soybean fields. Six species of stink bugs were found in cotton with *E. servus* and *T. c. accerra* accounting for the majority (58 and 38%, respectively) of stink bugs collected from cotton. *Euschistus servus* also was the prevalent species found in corn (67%). As in 2011, our results in 2012 indicate *E. servus* and *T. c. accerra* are likely responsible for most of the damage observed in BRB cotton. Our findings also suggest nearby soybean fields and, to a lesser extent, corn fields may be contributing these stink bugs to cotton, particularly as these two crops begin to mature.

Introduction

Historically, stink bugs have been a minor or non-economical pest of cotton in the Brazos River Bottom (BRB) production area of Texas, largely because insecticide applications for the boll weevil, *Anthonomus grandis* (Boheman), kept stink bug populations in check. However, the number of insecticide applications and acreage treated for boll weevils in the BRB has been greatly reduced over the past several years due to the success of the Texas Boll Weevil Eradication Program. In fact, this production zone was declared "suppressed" in 2012. Consequently, stink bugs have only recently emerged as a major pest of cotton in the production area. Many BRB producers reported substantial yield losses to stink bugs during the past few years, but were uncertain which species were infesting fields and causing the majority of damage. We initiated a study in 2011 to determine which species commonly infest cotton fields in the BRB. We also examined the species composition and relative abundance of stink bugs in nearby corn, milo, and soybean fields to determine which of these crops may be contributing stink bugs to cotton. Presented herein is an overview of our findings from the second year of the study in 2012.

Materials and Methods

Eight fields each of cotton, corn, milo, and six soybean fields throughout the BRB production area were sampled weekly for stink bugs in 2012. Sampling was initiated when crops reached the following growth stages: green silk for corn; first week of bloom for cotton; and full bloom for milo and soybean. Sampling was continued in a field until respective plants were harvested or reached physiological maturity. Standard 16-inch sweep nets were used to sample cotton and soybean fields (200 sweeps x two rows per field). Corn fields were sampled by visually examining plants (240 plants per field) and hand-collecting observed stink bugs. Milo plants were sampled by vigorously tapping the entire seed head into a sweep net (240 heads per field) to dislodge stink bugs. Samples were collected from all sides of each field and >15 m from the field margin to minimize border effects. Collected stink bugs (adults and nymphs) were transferred to sealable plastic bags and returned to a laboratory. Nymphs were placed in 100-ml Petri plates and reared to adulthood for subsequently identification, but the data presented herein are based solely on collections of adults. Adult stink bugs were identified to species using dichotomous keys (Rolston 1974, Rider and Chapin 1992, McPherson and McPherson 2000) and published illustrations (Esquivel et al. 2009). Occasionally, identified specimens were sent to the Texas A&M University Insect Collection Facility for confirmation by the Associate Curator, Edward G. Riley.

Results and Discussion

The total number of adult stink bugs collected in 2012 was considerably lower than that obtained in 2011. However, similar to 2011, a total of 10 phytophagous stink bug species were found among the four crops in 2012 (Table 1). Two additional species of stink bugs (*Euschistus variolarius* and *Hymenarcys nervosa*) were collected in 2012 that were not observed in 2011. Likewise, two species collected in 2011 (*Chinavia hilaris* and *Cosmopepla lintnerinia*) were not detected in 2012. Three species, *E. servus* (Say), *O. pugnax* (F.), and *T. c. accerra*, were found in all four crops in 2012. These same three species and *C. hilaris* were found in all four crops in 2011. Milo fields contained the greatest abundance of stink bugs on a per field basis (80/field) in 2012, whereas soybean fields contained the greatest abundance in 2011. As in 2011, soybean fields also contained the greatest diversity of stink bugs species in 2012 (Table 1). Six species were found in cotton fields (Table 1) with *E. servus* and *T. c. accerra* comprising the majority of stink bugs (58 and 38%, respectively) collected from cotton. *Euschistus servus* also was the prevalent species (67%) found in corn fields, followed by *T. c. accerra* (14%). *Thyanta custator accerra* (43%) and *E. servus* (41%) were the two most prevalent species collected from soybean fields. *Oebalus pugnax* (78%) was by far the most abundant species collected in milo.

Table 1. Species of stink bugs found in various crops produced in the Brazos River Bottom production area of Texas, 2012.

Stink bug species	Corn	Cotton	Milo	Soybean
Thyanta custator accerra	X	X	X	**P**
Oebalus pugnax	X	*X*	**P**	X
Euschistus servus	**P**	**P**	X	X
Euschistus quadrator		*X*		X
Euschistus crassus		X		X
Euschistus variolarius				X
Edessa bifida				X
Piezodorus guildinii				X
Mecidea major		*X*	X	*X*
Hymenarces nervosa				X

P indicates most prevalent stink bug species found within a crop
X indicates only one specimen found in a particular crop.

Although *C. hilaris* and *N. viridula* were commonly observed in soybean and cotton fields in production years prior to the initiation of our study, neither of these two species were collected in 2012. Interestingly, no southern green stink bugs were collected in 2011 as well. It has been speculated that the prevalence of "brown" over "green" stink bugs may be partially attributed to the brown stink bug's increased tolerance to insecticides. It also has been shown that temperature during the winter is probably the most important factor contributing to the annual variation in *N. viridula* populations (Kiritani 1964, Kiritani et al. 1966, Jones and Sullivan 1981). Indeed, the winter of 2010/2011 was unusually cold in the BRB and may have resulted in substantial mortality of overwintering adults. Severe drought conditions during the 2011 growing season also may have been a contributing factor as stink populations, in general, were considerably lower in 2011 than in previous years. Interestingly, a general decline in *N. viridula* populations has been observed in the Southeast Cotton Belt, but the complete absence of *N. viridula* populations for two years and sudden disappearance of *C. hilaris*, has not been documented elsewhere. Further investigation of this phenomenon may provide insight on factors that influence stink bug population dynamics in cotton.

Conclusions

Based on our findings in 2011 and 2012, the brown (*E. servus*) and red-shouldered stink bug (*T. c. accerra*) appear to be the two main species infesting cotton fields in the BRB production area, and subsequently are likely responsible for most of the stink bug damage observed in cotton. Our findings also suggest soybean and corn fields may be contributing these stink bugs to cotton as these two species were abundantly found in nearby soybean fields and, to a lesser extent, in corn fields. However, the spatial and temporal utilization of non-cultivated hosts (i.e.,

weeds) by stink bugs also needs to be examined to determine whether the presence or absence of these weed hosts affect stink bug populations in cotton. Although stink bug populations, in general, were considerably lower in 2012 than in the previous year, factors responsible for the complete absence of the green and southern green stink bugs remain unknown and warrant investigation. Such investigations may ultimately provide information that can be used to enhance management strategies for these pests in cotton.

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