

Abundance and Species Composition of Stink Bugs (Heteroptera: Pentatomidae) in Georgia Winter Wheat¹

G. David Buntin² and Jeremy K. Greene³

Department of Entomology, University of Georgia, Georgia Experiment Station, Griffin, GA 30223-1797 USA

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Stink bugs (Heteroptera: Pentatomidae) are important pests of many crops in the southeastern United States. All major phytophagous species are polyphagous and attack a series of host plants in sequence throughout the season. Stink bugs infest winter wheat, *Triticum aestivum* L. em Thull, in the spring during grain development but are not considered significant economic pests of the crop. Winter wheat may serve as a 'bridging' host (e.g., permitting the buildup of stink bugs that move and may cause damage to summer crop hosts). The objective of this study was to document the species composition, abundance, and damage potential of stink bugs and related species in winter wheat in Georgia.

Wheat in the coastal plain region of Georgia was sampled in 1999 (5 fields) and 2000 (7 fields). In 1999, fields in Brooks, Colquitt, Mitchell, Decatur and Tift counties were sampled weekly for 3 to 5 wks during wheat milk stage to maturity by taking 20 to 25 sets of 25 sweeps for a total of 500 or 625 sweeps per field, using a 38-cm diam sweep net. The first sample was collected near the field edge and samples were collected in a U pattern across each field. In 2000, two fields in Sumter, Washington and Houston counties and one field in Tift Co. were sampled once from 19 to 28 April during milk to soft dough stage of wheat development by taking five sets of 100 sweeps per field. Nymphs and adults of pentatomids and related families were counted.

Stink bugs were more numerous in wheat in 1999 than in 2000 (Table 1). Stink bug adults and nymphs were collected in 1999, but only adults were collected in 2000. By sampling fields once in April in 2000, we may have missed collecting nymphs, which occurred mostly in May in 1999. The rice stink bug, *Oebalus pugnax* (F.), was the most abundant species in both years followed by the brown stink bug, *Euschistus*

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²Address all inquiries to gbuntin@griffin.uga.edu.

³Present address: University of Arkansas, Southeast Research & Extension Center, P.O. Box 3508, Monticello, AR 71656.

Table 1. Stink bug (SB) totals per 100 sweeps collected in wheat during 2 yr

Species/taxa	Number (\pm SD)/100 sweeps/field/week		
	1999		2000
	Nymphs	Adults	Adults
Rice SB (<i>Oebalus pugnax</i>)	0.14 \pm 0.08	6.94 \pm 1.63	1.43 \pm 0.45
Southern green SB (<i>Nezara viridula</i>)	0.91 \pm 0.27	2.74 \pm 0.71	0.13 \pm 0.07
Brown SB (<i>Euschistus servus</i>)	3.45 \pm 1.11	1.66 \pm 0.43	0.17 \pm 0.06
Other Brown SB (<i>Euschistus</i> spp.)	1.36 \pm 0.71	0.08 \pm 0.05	0.03 \pm 0.03
Red-shouldered SB (<i>Thyanta accera</i>)	0.02 \pm 0.01	0.01 \pm 0.01	0
Spined soldier bug (<i>Podisus maculiventris</i>)	0.18 \pm 0.08	0.19 \pm 0.06	0
Burrower bug (<i>Sehirus cinctus</i>)	0	0	0.37 \pm 0.17
Total SB	6.06 \pm 1.61	11.63 \pm 2.34	2.10 \pm 0.59

servus (Say), and southern green stink bug, *Nezara viridula* (L.). These three species accounted for 90% and 82% of all adult stink bugs collected in the two respective years. The green stink bug, *Acrosternum hilare* (Say), was not collected in either year.

Oebalus pugnax is reported as a seed-feeding pest of grassy hosts including rice, cereal grains, corn, sorghum, and numerous other grasses (McPherson and McPherson 2000. Stink Bugs of Economic Importance in America North of Mexico, CRC Press, Boca Raton, FL). Nymphs accounted for about 2% of the rice stink bugs collected in 1999. This suggests that, while adults presumably were feeding on wheat grain, *O. pugnax* was not reproducing to any significant degree in wheat. Because of the size of acreage, winter wheat probably is an important adult food host in April and May.

Nezara viridula and *E. servus* feed on many grass and broadleaf hosts, including cotton, corn, sorghum, soybean, pecan, and many others (McPherson and McPherson 2000). Nymphs accounted for 25% of *N. viridula* and 71% of *E. servus* individuals collected in 1999. Furthermore, few nymphs of either species were present on the week 1 (20 April) sample, but nymphal numbers of both species steadily increased and peaked in week 4 (11 May). This indicates that *N. viridula* and *E. servus* were using winter wheat as a bridging host for the first generation development. Jones and Sullivan (1982, Environ. Entomol. 11: 867-875) stated that because of the large acreage, winter wheat was an important spring host for *E. servus* in the coastal plain region of South Carolina. They also collected adults from mid-April and nymphs from mid-May until crop maturity in early June.

Other *Euschistus* spp., including *E. tristigmus* (Say), *E. variolarius* (Palisot de Beauvois), *E. quadrator* and *E. obscurus*, were grouped together and accounted for 8% of stink bugs in 1999 but only 1.4% of stink bugs in 2000. Most of these stink bugs were *E. tristigmus*. Nymphs and adults were collected from May 11 to 18 in 1999. All *Euschistus* species collected were polyphagous and routinely attack cultivated and uncultivated hosts (McPherson and McPherson 2000). *Euschistus tristigmus* is an

important pest of orchard crops, and *E. variolarius* is reported to damage seedling corn (Annan and Bergman 1998, J. Econ. Entomol. 81: 649-653).

Several specimens of the red-shouldered stink bug, *Thyanta custator accera* McAttee, were collected in 1999. Nymphs and adults of the predaceous species, *Podisus maculiventris* (Say), also were collected from wheat in 1999.

A related insect *Sehirus cinctus* (Palisot de Beauvieux), a burrower bug in the family Cydnidae, was second in abundance in 2000 but was not collected in 1999. This species develops on henbit (*Lamium amplexicaule*) and other mints and is not considered to be an important crop pest. Adults of the leaf-footed bug, *Leptoglossus phyllopus* (L.) (Family Coreidae), were collected in low numbers in both years. Mean (\pm SD) numbers per field per week were 0.46 ± 0.31 in 1999 and 0.07 ± 0.04 in 2000 bugs per 100 sweeps. This species commonly is observed feeding on developing seedpods and seed during reproductive development of numerous crops and uncultivated plants.

The effect of stink bugs on wheat grain is not clear. A field cage experiment found that one sexed pair of either *N. viridula* or *O. pugnax* feeding on 20 grain spikes for 15 days during the milk stage reduced wheat kernel weight, seed germination, and baking quality as measured by particle size index (Viator et al. 1983, J. Econ. Entomol. 76: 1410-1413). Damage severity was associated with the number of stylet sheaths produced by both species. Feeding during soft dough stage had less effect on wheat kernel weight and seed germination and little effect on grain baking quality. These authors concluded that both species can be managed as a group with control measures only being warranted during the milk stage.

The effect of *E. servus* feeding injury on wheat grain weight and quality has not been determined. However, all *Euschistus* spp. collected were similar in size and probably can be considered to have the same damage potential as *N. viridula* and *O.*

Table 2. Weekly mean number of stink bugs collected in headed wheat during 1999

Stink bug species	Stage	Number/100 sweeps/field				
		Apr 20 Wk 1	Apr 27 Wk 2	May 4 Wk 3	May 11 Wk 4	May 18 Wk 5
Southern	Nymph	0.10	0.16	0.86	1.66	1.40
Green	Adult	3.50	2.52	3.57	2.18	2.32
Brown	Nymph	0	1.00	4.69	6.62	2.72
	Adult	4.30	1.64	1.13	0.70	2.24
Rice	Nymph	0	0	0.29	0.13	0.24
	Adult	6.60	4.40	8.70	9.54	4.84
Other	Nymph	0	0	0	3.65	2.60
<i>Euschistus</i>	Adult	0	0	0	0.13	0.28
Total	Nymph	0.10	1.44	5.91	12.48	7.00
	Adult	14.50	8.68	13.63	12.96	9.72

pugnax in wheat. Thus, all phytophagous stink bugs probably can be managed as a group in wheat.

Wheat typically has about 30 spikes per 0.1 m²; therefore, one pendulum sweep presumably would sample about 60 grain spikes. The total number of stink bugs collected on any week in 1999 did not exceed 0.145 bug per sweep (Table 2), which is well below the 2 bugs per 20 spikes reported to cause damage by Viator et al. (1983). This suggests that the potential for stink bugs to cause significant yield loss to winter wheat in Georgia is low. However, control may be justified in wheat grown adjacent to summer crops such as vegetables or cotton where stink bugs can damage seedling plants. Future research, perhaps on a community-managed level, could address whether it is better to control stink bugs in wheat before harvest or treat stink bug infestations in adjacent crops as needed.

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