

Stink Bugs and Leaffooted Bugs Are Important Fruit, Nut, Seed and Vegetable Pests¹

Russell F. Mizell, III²

Stink bugs (Pentatomidae) and leaffooted bugs (Coreidae) are important direct pests of many seed, fruit, vegetable and nut crops. Recently they have become serious pests of cotton because of the reduction in pesticide use resulting from the eradication of the boll weevil and the implementation of genetically-modified cotton.

Stink bugs and leaffooted bugs have similar life cycles. Eggs are placed on the host plant in large masses. The nymphs and adults feed on a variety of herbaceous weeds such as *Crotalaria* spp., *Yucca* spp., Jimson weed, grasses (bahiagrass) and many crops including corn, peach, pecan, peanut, soybean and tomato. Four or five generations may occur in a single year. Stink bugs usually overwinter as adults but may remain active all year when the weather remains mild. Stink bugs are very mobile with the adults moving from crop to crop as the season progresses. When crop and weed hosts mature and die in the fall, stink bugs move into pecan orchards or other woodlots looking for food and overwintering sites. Some stink bug species overwinter under the bark of trees.

Pecan and peach will be used as examples to discuss the habits and impact of stink bugs. Several species normally inhabit pecan often in low populations. In the fall, populations increase as stink bugs outside the orchard along with other stink bug species enter orchards in the fall where they are commonly referred to as kernel-feeding Hemiptera. The timing and movement of stink bugs into pecan in the fall is

related to weather conditions and to the type of vegetation and crops surrounding the orchard. For example, drought conditions increase the numbers of bugs in the orchard as does cooler weather. Weeds also attract and hold stink bugs in orchards. Peanuts should not be planted near a pecan orchard because stink bugs move out of peanuts into pecan when peanuts are harvested. On the other hand, research has found that small plots of soybean planted outside the orchard as a trap crop during the growing season can be effective at suppressing stink bug populations and reducing pesticide use within the orchard if the soybeans are treated on a timely basis with pesticides.

Stink bugs that feed on pecans before shell hardening cause injury termed “black pit” that leads to nut abscission. In nuts with black pit, the interior is decayed and black in color. Species that feed on nuts after shell hardening damage the kernel, but rarely cause abscission. This damage is termed kernel spot (Fig.1). The kernel spots are variable in size, sunken and bitter to taste. Kernel spot lowers nut quality and is undetectable until shelling.

The following bugs are the most prevalent in pecan and peach: the brown stink bug *Euschistus servus* (Say) (Fig. 2); the dusky stink bug *E. tristigmus* (Say), the rice stink bug *Oebalus pugnax* (F.) (Fig. 3); the green stink bug *Chinavia hilaris* (Say) (formerly *Acrosternum hilare*) (Fig. 4); the southern green stink bug *Nezara viridula* (L.), *Proxys punctulatus* (Palisot de Beauvois) (Fig. 5); *Brochymena*

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2. Russell F. Mizell, III, professor, Extension Specialist, Pest Management, North Florida Research and Education Center, UF/IFAS Extension, Gainesville, FL 32611.

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Figure 1. Kernal spot damage in pecan.
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Figure 2. An adult brown stink bug, *Euschistus servus* (Say).
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sp., the big-legged bug *Acanthocephala femorata* (F.) (Fig. 6); the horned squash bug *Anasa armigera* (Say), and the leaffooted bugs *Leptoglossus phyllopus* (L.) (Fig. 7); and *L. oppositus* (Say). The brown marmorated stink bug, *Halyomorpha halys* Stål is a polyphagous invasive species that has recently become a major pest of fruit and vegetable crops in mid-Atlantic states. The most important species occurring in Georgia and Florida pecan orchards all season were *A. hilare*, *N. viridula* and *E. servus* (Say). Some of these same species are the most common in many other crops. Adult *N. viridula* causes 34%–53% nut drop and *E. servus* causes 73% nut drop when feeding on pecans prior to shell hardening. All nuts with black pit drop prematurely and the cultivars with thin-shelled nuts such as ‘Schley,’ ‘Curtis’ and ‘Wichita’ are preferred by stink bugs.



Figure 3. The rice stink bug, *Oebalus pugnax* (F.).



Figure 4. The green stink bug *Acrosternum hilare* (Say).

Euschistus spp. are the most important stink bugs and *Leptoglossus* spp. are the most important leaffooted bugs infesting peach and nectarine. Species from both genera emerge from overwintering sites before or during bloom and fruit set. Early emerging adults often feed on winter-annual weeds.

The bugs begin fruit feeding around the time that the fruit enters the shuck split stage. Stink and leaffooted bugs are piercing-sucking feeders. They use their saliva to penetrate

their food material, dissolve the contents and then suck up the digesting mixture. Feeding damage in peach and nectarine destroys part of the developing fruit. As a result of this loss, the damaged portion of the fruit does not grow. As the healthy tissue continues to grow around the damaged area, this uneven growth forms the typical fruit injury known as catfacing (Fig. 8). Fruits with catfacing damage are not marketable and usually fall from the tree prematurely if damaged in early season. Signs of stink and leaffooted bug feeding consist of puncture wounds with droplets or rivulets of congealed saliva and fruit fluids (Fig. 9).



Figure 5. The stink bug *Proxys punctulatus* (Palisot de Beauvois).

Stink bugs have many natural enemies, most notably parasitic flies in the family Tachinidae. These parasites place their eggs directly on the adults. The eggs, when present, can be easily seen as raised white spots about 1–2 mm in diameter around the head and “shoulder” area. Interestingly, some stink bug species are also predacious and often colorfully marked (Fig. 10, 11, and 12). The beneficial predacious stink bug species can be separated from the phytophagous pest species by comparison of the morphology of the mouthparts, collectively termed the proboscis. The proboscis of the beneficial species fold back under the body leaving a space between the body and the mouthparts, whereas in the pest species, the proboscis appear attached to the head at the anterior tip of the head ventrally (Fig. 13). The proboscis is folded inside two structures, one on either side of the ventral portion of the head such that the mouthparts are held steady during feeding to enable penetration into the food material.



Figure 7. The leaffooted bug *Leptoglossus phyllopus* (L.).



Figure 6. The leaffooted bug *Acanthocephala femorata* (F.).



Figure 8. Catfacing damage in peach.



Figure 9. The sign of stink bug feeding damage on peach.



Figure 11. The predacious stink bug *Podisus maculiventris* (Say).



Figure 10. The predacious stink bug *Euthyrhynchus floridanus*.



Figure 12. The predacious stink bug *Alcaeorrhynchus grandis* (Dallas).

Both sexes of stink bugs and the nymphs cause damage by their feeding. The sex of *E. servus* and related species can be determined by examining the structures on the ventral side of the posterior. Males have a scoop-shaped structure on their posterior that the females do not have (Fig. 14). Female *Euschistus* spp. are also usually larger in size than males. As the males and females prepare to overwinter in diapause, their appearance changes. Their bodies become entirely mottled with light reddish spots.

The green and the southern green stink bugs appear very similar to the naked eye. They can be distinguished using the scent glands located on each side of the second pair of legs. The ostiolar canal of *C. hilaris* is larger extending beyond the middle of the supporting plate.

Stink bugs are difficult to control with insecticides. There are very few tools available to homeowners and organic growers. Because stink bugs and leaffooted bugs have many hosts and are very mobile, they can become a problem at any time during the season. They can be removed by hand or with a butterfly net from small plantings in gardens. A trap invented by the author that exploits the visual behavior of the bugs can be constructed and used to suppress populations (Fig. 15). There is also a pheromone attractant available, methyl (*E, Z*)-2,4-decadienoate, that will enhance the capture rate of *Euschistus* spp. Used in conjunction with the yellow stink bug trap, stink bugs can be suppressed in small plots in north Florida and south Georgia. Consult

your local UF/IFAS Extension office for further information <http://solutionsforyourlife.ifas.ufl.edu>.

References for Further Reading:

Aldrich, J., M. Hoffman, J. Kochansky, W. Lusby, J. Eger and J. Payne. 1991. Identification and attractiveness of a major component for Nearctic *Euschistus* spp. stink bugs (Heteroptera: Pentatomidae). *Environ. Entomol.* 20: 477–483.

Dutcher, J. D. and J. W. Todd. 1983. Hemipteran kernel damage of pecan. In Payne, J. A. (ed.). Pecan Pest Management - Are We There? *MPEAAL* 13:1–140. pp. 1–11.

McPherson, J. and R. McPherson. 2000. *Stink bugs of economic importance in America north of Mexico*. CRC Press Boca Raton, FL. 253 pp.

Mizell, R. F. & W. L. Tedders. 1995. Use of the modified Tedders trap to monitor stink bugs in pecan. *Proc. Southeast. Pecan Growers Assoc.* 88: 36–40.

Poplin, A., J. Eger, and A. Hodges. 2015. *Identifying Stink Bugs and Similar True Bugs of Florida*. Gainesville: University of Florida. 74 pp.



Figure 13. Delineation of phytophagous stink bugs (left) from predacious species (right).
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Figure 14. *Euschistus servus* (Say) adult female (left) and male (right).



Figure 15. The Florida stink bug traps.

Table 1. Pest and beneficial species of stink bugs and leaffooted bugs captured in the Florida stink bug trap.

Pentatomidae

Pests:

Banasa sp.
Brochymena arborea (Say)
B. quadripustala (F.)
Chinavia hilaris (Say)
Euschistus servus (Say)
E. tristigma (Say)
E. crenator
Galgupha atra Amyot and Serville
Hemenarchys nervosa (Say)
Nezara viridula (L.)
Obelus pugnax (F.)
Proxys punctulatus (Palisot de Beauvois)
Sehirus cinctus (Palisot de Beauvois)
Thyanta calceata (Say)
T. custator (F.)

Beneficial Predators:

Alcaeorrhynchus grandis (Dallas)
Euthyrhynchus floridanus (L.)
Podisus maculiventris (Say)
Stiretus anchorago (F.)

Coreidae

Pests:

Acanthocephala confraterna (Uhler)
A. terminalis (Dallas)
A. femorata (F.)
Euthochtha galeator (F.)
Leptoglossus phyllopus (L.)
L. oppositus (Say)
L. ashmeadi Heidemann
Alydinae sp.

Reduviidae

Beneficial Predators:

Apiomerus floridensis Szerlip
Arilus cristatus (L.)
Sinea spinipes (Herrich-Schaeffer)
Zelus exsanguis Stål