



Kudzu Bug, *Megacopta cribraria*, a pest of soybeans

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Figure 1. Adult kudzu bug on soybean leaf (Photo: Jeremy Greene, Clemson University, Bugwood.org).

Introduction

The kudzu bug (Figure 1), *Megacopta cribraria* (Hemiptera: Plataspidae), is an invasive soybean pest from Asia that first appeared in the United States in 2009 near Atlanta, GA. Kudzu bugs are the only representative of the family Plataspidae in the continental United States. Other names for the insect include the bean plataspid, lablab bug, or globular stink bug.

Since its initial introduction, kudzu bug has spread outward from Atlanta (Figure 2) to an additional reported 18 states and the District of Columbia. It was first reported in Virginia in 2011.

Adult kudzu bugs are a mottled dark green and brown in color and approximately one-quarter inch in length. Despite the bug's similar appearance to other closely related insects, it is not a beetle or stink bug, but a shield bug. When disturbed, adult insects may exude a pungent, yellow-orange defensive substance that can stain skin and clothing.

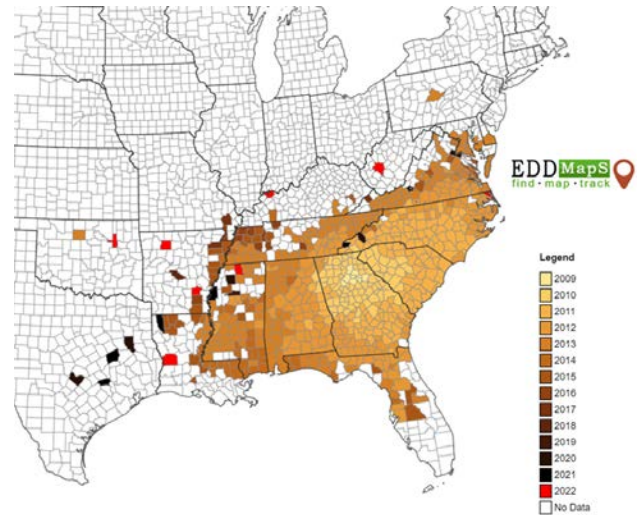


Figure 2. Map of kudzu bug distribution as of 2022 (Bugwood Center for Invasives Species and Ecosystem Health, kudzubug.org).

Kudzu bugs are plant phloem feeders, meaning that their mouthparts pierce the vascular system of plants to suck nutrients and moisture. Plant damage can be indirect, in the form of overall plant health decline due to feeding, or direct, in the form of feeding on fruiting portions. While kudzu bug was initially expected to be a significant threat to commercial soybean growers, populations only occasionally reach actionable thresholds. Monitoring and management are still recommended as necessary.

Life Cycle

In its invasive range of the U.S., kudzu bug has two generations per year. Adults typically emerge from overwintering locations in early spring depending on weather patterns and geographic location. Common overwintering locations are under tree bark (Figure 3), under leaf litter, or inside structures such as homes or sheds. Females can overwinter with fertilized eggs already inside their bodies. In spring,



Figure 3. Kudzu bug adults overwintering under tree bark (Photo: University of Georgia).

surviving overwintering females can lay these already fertilized eggs to start the first generation of kudzu bugs, or unmated females will find and mate with males and then lay eggs. Eggs are white, barrel-shaped in appearance, and are laid in two side-by-side rows (Figure 4). Eggs are usually laid on the undersides of plant leaves (kudzu or soybean) or on apical tips of kudzu vines. After emerging from eggs, neonate kudzu bugs will remain close to eggshells (Figure 4). When a female kudzu bug lays her eggs, she also deposits a packet of gut endosymbionts with each egg. Neonates must consume this endosymbiont to survive; without it, they will not be able to grow and develop normally.



Figure 4. Neonate kudzu bugs surrounding hatched eggs with endosymbiont packets attached (Photo: Joe Eger, Dow Agroscience, Bugwood.org).

Kudzu bugs molt through five nymphal stages before becoming adults (Figure 5). Immature kudzu bugs look different from adults in that they are lighter in color, appear fuzzy or hairy instead of smooth, and do not have wings.

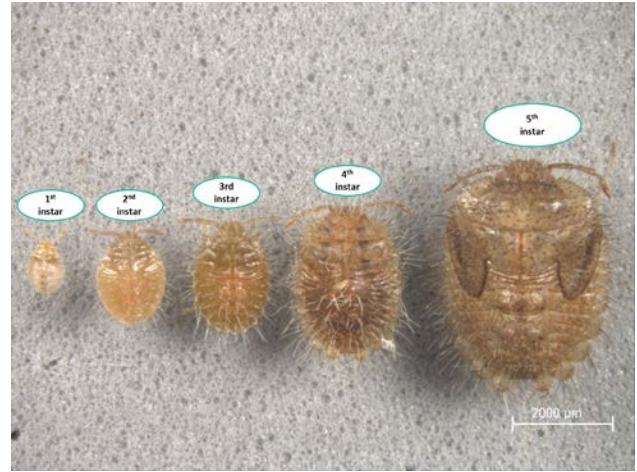


Figure 5. Five stages of nymphal kudzu bugs (Photo: <https://blogs.ext.vt.edu/soybean-update/2013/07/02/kudzu-bug-update/>)

Pest Status and Negative Impacts of Kudzu Bug

Kudzu bug is a pest of soybeans in its native range of Japan, India, and China. During the early stage of invasion in Georgia and South Carolina, kudzu bug reduced soybean yield by 20 to 47 percent. However, due to pathogens and parasitoids, kudzu bug pressure has steadily declined since 2013. Although kudzu bug feeds primarily on kudzu and soybeans, it is also attracted to other plants in the legume family (Fabaceae).

Kudzu bugs seek shelter to overwinter in late fall when temperatures start to decline. They have an affinity for white and tan structures (Figure 6), most likely because these structures retain heat during cold winter months. The kudzu bug's small size allows it to fit through very small gaps or openings. To prevent their entrance into homes, seal any openings around windows or home exteriors.



Figure 6. Adult kudzu bugs on the exterior of a white home (Photo: Daniel R. Suiter, University of Georgia, Bugwood.org).

Management

If you are a soybean grower, scout soybean fields with a 15-inch diameter sweep net to monitor for kudzu bug presence and abundance. If you are a homeowner, even one bug in the home is likely to be unwelcome.

Chemical control

Although there are several options for chemical control of kudzu bug in soybean, insecticides with pyrethroids and neonicotinoids as active ingredients provide the most reliable control. It is extremely important to scout for kudzu bugs before implementing any form of chemical spray. The recommended action threshold for applying chemical sprays is 25 nymphs per 25 sweeps, or one nymph per sweep. At certain points throughout the growing season, the number of adults in a field may be very high. If possible, delay spraying until nymph populations reach threshold level.

There are currently no insecticides labeled for chemical control of kudzu bug inside of homes.

Biological control

At least two species of extremely small wasps, *Paratelenomus saccharalis* and *Ooencyrtus nezarae*, parasitize kudzu bug eggs (Figure 7) and considerably reduce pest populations in the field. Naturalized populations of these parasitoids have been found in southern US states, including VA, and kudzu bug management is aided by the wasps in these locations.



Figure 7. Egg parasitoid *Paratelenomus saccharalis* (black arrow) emerging from a kudzu bug egg (Photo: modified from Ademokoya et al. 2018).

Beauveria bassiana (Figure 8) is a soil-dwelling fungus that, when present, can provide high levels of kudzu bug control. This fungus has been positively identified on kudzu bug in Virginia and rapidly spreads between bugs as they aggregate to overwinter.



Figure 8. A kudzu bug adult infected by the fungal agent, *Beauveria bassiana* (Photo: Mark Bailey, University of Georgia, Bugwood.org)

Cultural control

Although extremely difficult, it is helpful to remove or decrease the size of kudzu patches if they are located adjacent to farms or homes. Kudzu patches are a reservoir for kudzu bug populations.

References

Ademokoya, B., R. Balusu, C. Ray, J. Mottern, and H. Fadamiro. 2018. "The First Record of *Ooencyrtus nezarae* (Hymenoptera: Encyrtidae) on Kudzu Bug (Hemiptera: Plataspidae) in North America." *Journal of Insect Science* 18(1)

<https://doi.org/10.1093/jisesa/iex105>

Bugwood Center for Invasives Species and Ecosystem Health. Kudzu bug distribution map.

<https://www.kudzubug.org/>

Dhammi, A., J.B. Van Krestchmar, L. Ponnusamy, J.S. Bacheler, D.D. Reisig, A. Herbert, A.I. Del Pozo-Valdivia, and R.M. Roe. 2016. "Biology, Pest Status, Microbiome and Control of Kudzu Bug (Hemiptera: Heteroptera: Plataspidae): a New Invasive Pest in the US." *International journal of molecular sciences* 17(9):1570.

Diedrick, W., L.H. Kanga, M. Haseeb, M. Srivastava, and J.C. Legaspi. 2023. "Population Dynamics and Parasitism of the Kudzu Bug, *Megacopta cribraria*, by Egg Parasitoid *Paratelenomus saccharalis*, in Southeastern USA." *Agriculture* 13(1)

<https://doi.org/10.3390/agriculture13010013>

Gardner, W.A., J.L. Blount, J.R. Golec, W.A. Jones, X.P. Hu, E.J. Talamas, R.M. Evans, X. Dong, C.H. Ray Jr, G.D. Buntin, and N.M. Gerardo. 2013. "Discovery of *Paratelenomus saccharalis* (Dodd) (Hymenoptera: Platygasteridae), an Egg Parasitoid of *Megacopta cribraria* F. (Hemiptera: Plataspidae) in its Expanded North American range." *Journal of Entomological Science* 48(4):355-359.

Kesselring, K. 2016. "Researchers Trying to Understand Declining Kudzu Bug Populations." University of Georgia Cooperative Extension. College of Agricultural & Environmental Sciences Newswire.

<https://newswire.caes.uga.edu/story/5791/kudzu-bug-decline.html>

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