



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

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Figure 1: Adult kudzu bugs

Background and 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 original introduction, the spread of kudzu bug has radiated out from the central point of Atlanta (Figure 2). Kudzu bug is currently reported in 12 states and the District of Columbia. It was first reported in Virginia in 2011. Adult kudzu bugs are dark green in color and approximately ¼ inch in length. Despite the bug's similar appearance

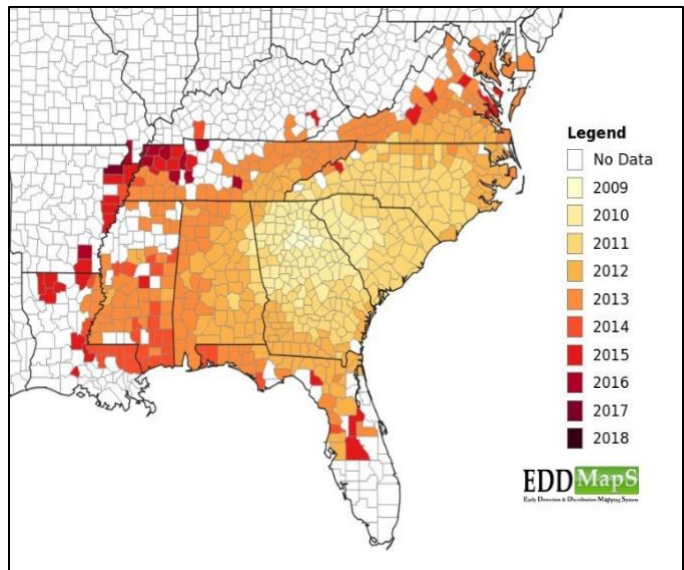


Figure 2: Distribution of kudzu bug in the United States, 2009-2018

to other closely related insects, it is not a beetle, stink bug, or shield bug. When disturbed, adult insects may exude a pungent, yellow-orange defensive substance that can stain skin and clothing. Kudzu bugs are plant phloem feeders meaning that their mouthparts pierce the vascular system of plants to suck nutrients and moisture. Damage to plants can be a result of indirect damage to overall plant health or direct damage from feeding on plant fruiting portions. Although kudzu bugs have been an actionable soybean pest in recent years, their presence is not as dominant as it once was.

Life Cycle

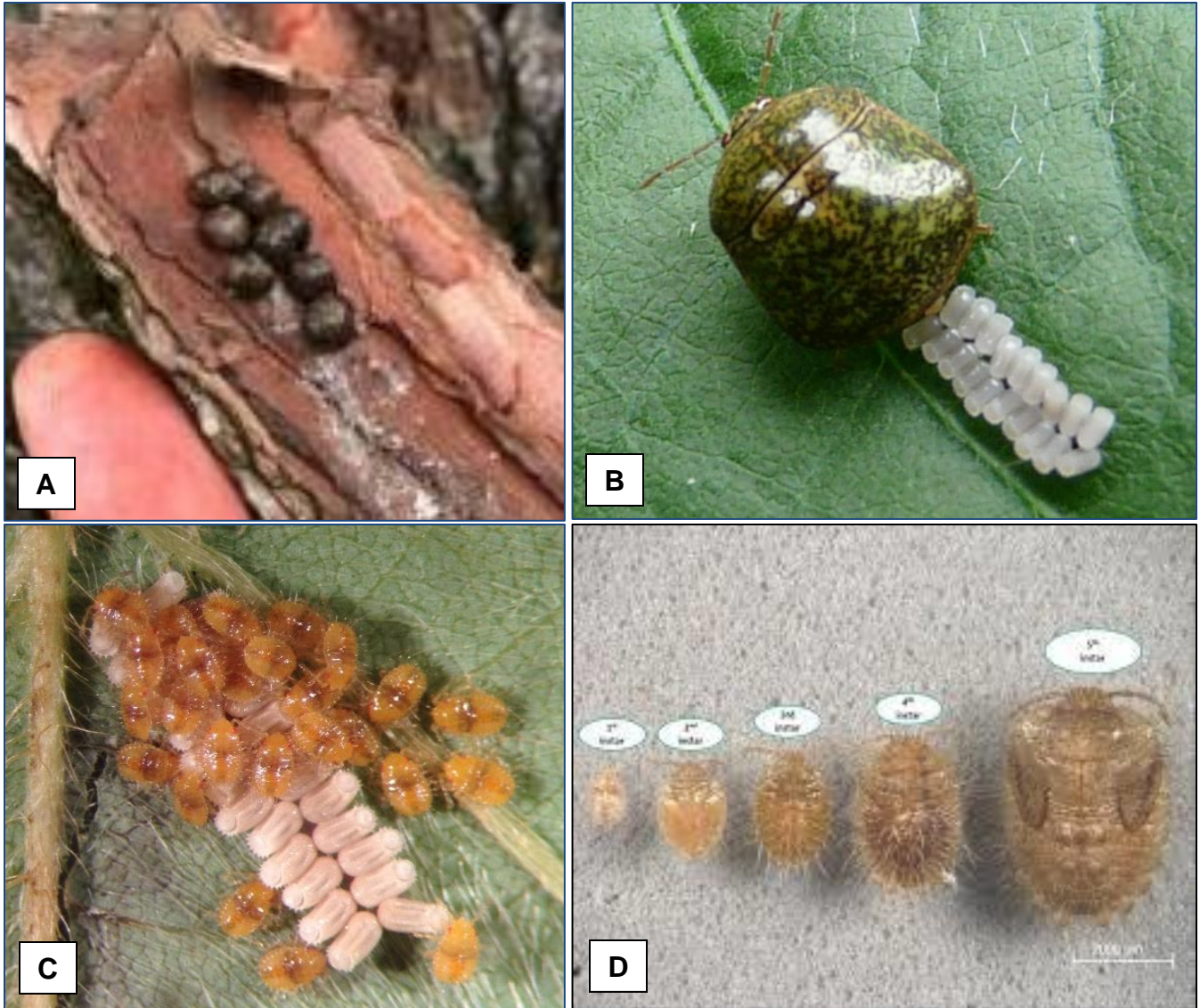


Figure 3: Kudzu bug life cycle

A- Kudzu bugs overwintering under tree bark; **B-** adult kudzu bug female laying eggs; **C-** neonate kudzu bugs feeding from endosymbiont packets after hatching; **D-** 5 stages of nymphal kudzu bugs

In its invasive range of the United States, kudzu bug has two generations per year. Insects typically emerge from overwintering locations in early spring; however, actual time of emergence varies depending on weather patterns and geographic location. Common overwintering locations are under tree bark (Figure 3A), under leaf litter, or inside sound structures such as

homes or sheds. Females can overwinter with fertilized eggs already inside their bodies. In spring, surviving overwintering females can lay these already fertilized eggs to start the first generation of kudzu bugs, or females with no prior fertilized eggs will mate with males and then lay eggs. Eggs are white, barrel-shaped in appearance, and are laid in two side-by-side

rows (Figure 3B). Eggs are most commonly 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 egg shells (Figure 3C). When egg laying occurs, female kudzu bugs also deposit packets of a gut endosymbiont. Neonates must consume this endosymbiont to survive; without it, they will not be able to grow and develop normally. Kudzu bugs will go through five stages of growth before becoming adults (Figure 3D). Immature insects look different than the adults and do not have wings.

Pest Status and Negative Impacts of Kudzu Bug

Kudzu bug is a pest of soybeans. It has been reported as a soybean pest 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%. Although kudzu bug feeds primarily on kudzu and soybeans, it is also attracted to plants in the legume family (Family Fabaceae). Kudzu bugs seek shelter for overwintering in late fall when temperatures start to decline. They have an affinity for white and tan structures (Figure 4), most likely due to the fact that these structures retain heat during cold winter months. To prevent their entrance into homes, seal any openings around windows or home exteriors. Kudzu bug's small size allows it to fit through cracks or smaller openings that may have not been noticed previously.

Management of Kudzu Bug

If you are a soybean grower, it is important to 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.



Figure 4: Adult kudzu bugs on the exterior of a white home

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 keep in mind that scouting should take place 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.

Inside of homes, there are currently no insecticides labeled for chemical control.

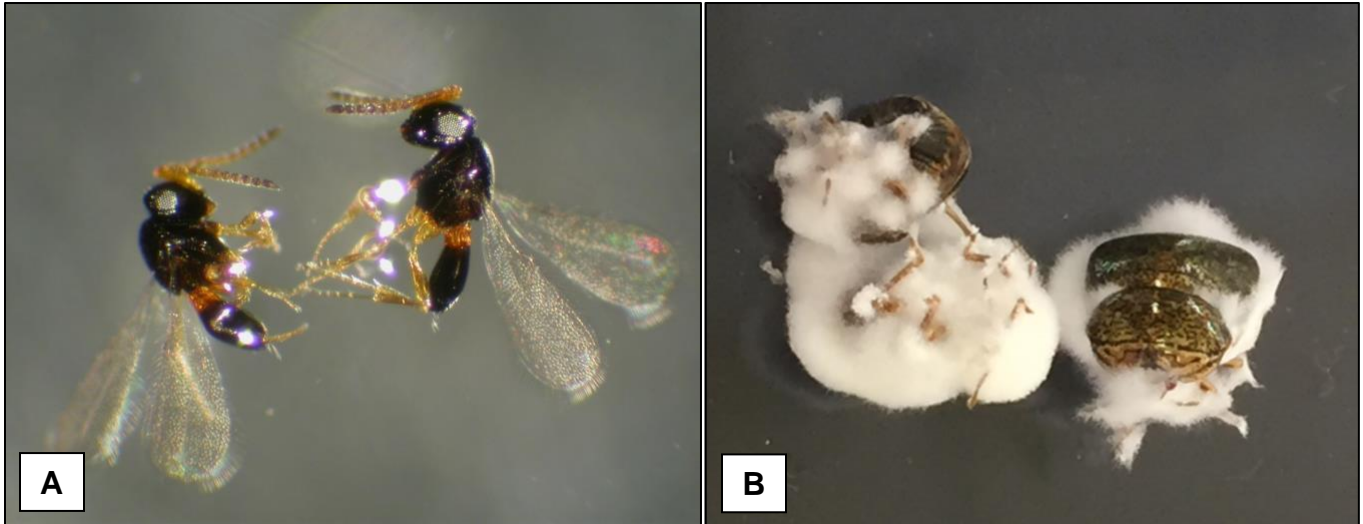


Figure 5: biological control of kudzu bug

A- Egg parasitoid *Paratelenomus saccharalis*; **B-** fungal agent *Beauveria bassiana*

Biological control

Paratelenomus saccharalis (Figure 5A) is an extremely small wasp that parasitizes kudzu bug eggs. Thus far, naturalized populations have been discovered in southern US states such as Georgia, Alabama, Mississippi, and Florida. Kudzu bug management is aided by the wasp in these locations. This wasp is a specific predator of kudzu bug and it will not target other insects.

Beauveria bassiana (Figure 5B) is a soil-dwelling fungus that, when present, can provide high

levels of kudzu bug control both in kudzu patches and soybean fields. This fungus has been positively identified in kudzu bug in Virginia.

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.