Megacopta cribraria (Heteroptera: Plataspidae) the "Kudzu Bug"



Image credit: Marlin Rice, DuPont Pioneer, used with permission of the author



"Kudzu Bug"

- Native to southeastern Asian countries including China, India and Japan
- First detection in the western hemisphere occurred October 2009 from the metropolitan Atlanta area
- aka *M. punctatissima*, bean plataspid, lablab bug, or globular stink bug
- Does not have an officially accepted common name in the U.S., but "kudzu bug" is pending



"Kudzu Bug" Distribution and Spread as of September 2014

No sampling

Sampled but not found

Intercepted or detected, but not considered established

Considered established by survey or consensus

Map courtesy of Pest Tracker, National Agricultural Pest Information System (NAPIS), and kudzubug.org– Accessed 9/11/2014 and http://www.kudzubug.org/distribution_map.cfm and SPROs and researchers from various states



Potential for spread in the U.S.



The recent rate and distribution of kudzu bug population expansion suggests that a major proportion of the soybean growing areas in the U.S. are likely to see kudzu bugs in the future



Map courtesy of http://www.kudzubug.org/distribution map.cfm - accessed 6/19/2014

Known Reproductive Hosts in the Western Hemisphere



Image credits:

Kudzu-Phillip Roberts, University of Georgia Soybean-Phillip Roberts, University of Georgia Edamame-Michael Toews, University of Georgia Pigeon Pea-Joni Blount, University of Georgia



Kudzu "the vine that ate the south"

- Introduced for forage then erosion control
- Covers millions of acres in the south
- An invasive weed
- Perennial vine in the legume family









Image credits:

Left - Leslie J. Mehrhoff, University of Connecticut, Bugwood.org, #5483285; middle – Leslie J. Mehrhoff, University of Connecticut, Bugwood.org, #5483454; right- Leslie J. Mehrhoff, University of Connecticut, Bugwood.org, #5483459

Non-Reproductive Hosts or "Resting Places" Include Just About Everywhere!

- Bug presence alone does not indicate damage or feeding
- Bugs are commonly observed on landscape plants, wooden poles, wheat, corn, cotton, pecans, peanut, figs, wisteria, snap beans, and many others







Image credits: Top- Jeremy Greene, Clemson University, Bugwood.org, #5426337 Bottom-Phillip Roberts, University of Georgia

Urban Nuisance





Image credits (all images): Dan Suiter, University of Georgia, (Bugwood.org, # 5407722 & 5407730)





Human Health Concern?





Images taken 2 h after sampling in heavily infested soybean plots. "Kudzu bug" nymphs dropped between boots and socks and were squished by walking. The resulting rash was itchy and lasted about 7 d.



Image credits: Michael Toews, University of Georgia

International Trade Implications

- In Spring 2012, containerized cargo from the southeastern U.S. was banned at Honduran ports over "kudzu bug" presence
- Honduras also reported that 3 live bugs were collected on commercial passenger jets originating from Atlanta, Georgia







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Feeding

- "Kudzu bugs" have piercing-sucking mouthparts and feed on stems and petioles
- Damaged stems exhibit purple lesions and often develop sooty mold
- "Kudzu bugs" do not feed on pods like our native and other exotic stink bugs





Image credits: Top-Phillip Roberts, University of Georgia Bottom-Marlin Rice, DuPont Pioneer, used with permission of the author

Soybean Damage

- "Kudzu bugs" are a stress inducing pest
- Pods may not fill and the beans are much smaller
- Soybean yield losses average 20%, but can reach 60%
- "Greening" or plants that do not senesce for timely harvest are common



Unprotected

Protected





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Identification





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Identification



First instars remain close to egg cases



External wing buds develop on late instars

Image credits: Top-Joe Eger, Dow AgroSciences Bottom-Phillip Roberts, University of Georgia, Bugwood.org



Identification



The scutellum or "shield" over the wings covers the entire abdomen

http://www.kudzubug.org/identification.html

Image credits (all images): Marlin Rice, DuPont Pioneer, used with permission of the author





Life Cycle

- "Kudzu bugs" have incomplete (or simple) metamorphosis
- Life stages include egg, nymph (5 instars) and adult
- Nymphs appear similar to adults, but they are hairy and do not have wings
- There are 2 generations per year (spring and summer)



Image credits: Top- Lyle Buss, University of Florida Middle- John Ruberson, University of Georgia Bottom-Jeremy Greene, Clemson University, Bugwood.org, # 5426299



Hibernation and Dispersal

Hibernation

- Overwinter as adults under tree bark and in leaf litter
- Bugs can be seen on tree bark on warm days during the winter
- Dispersal
 - Kudzu bugs disperse to kudzu in early spring and vegetative soybean when available

Late February



January





Image credits (all images): Phillip Roberts, University of Georgia, Bugwood.org

Monitoring with Traps

- Kudzu bugs are attracted to virtually any upright light colored surface
 - Inexpensive traps can be fashioned with flight intercept veins above soapy water or using sticky paper
 - There are no commercially available pheromone lures







Image credits (all images): Michael Toews, University of Georgia

Monitoring in Soybean



1.

3.



2.



4.





Video credit: Michael Toews, University of Georgia, http://www.kudzubug.org/video.html

Visual Inspection in Soybean



Adults are gregarious and easy to see



Small nymphs can be more difficult, but are evident when closely examining stems



Image credits (all images) Phillip Roberts, University of Georgia

Treatment Thresholds in Soybean

- Spraying adults on vegetative soybean is unlikely to boost yield as immediate reinfestation is common
- Data suggest that growers wait until immatures are present or beans reach the R3 to R4 developmental





Image credits: Phillip Roberts, University of Georgia

stage

Chemical Control in Soybean

PEST	INSECTICIDE	FORMULATION PER ACRE	LBS. ACTIVE PER ACRE
Kudzu Bug	acephate	0.75-1.0 lb	0.73-0.97
	bifenthrin	5.12-6.4 ozs 6.4 ozs	0.08-0.1 0.1
	clothianadin	3-4 ozs	0.05-0.67
	gamma-cyhalothrin	1.28-1.54 ozs	0.0125-0.015
	lambda-cyhalothrin	1.92 ozs	0.03
	zeta-cypermethrin	4 ozs	0.025

*some premixes also have 2(ee) label



protect U.S. community invasive species network

Biological Control





- An entomopathogenic fungus may exert some control
- Other parasitoids and predators observed include:
 - Tachinid flies
 - Egg specialist, Paratelenomus saccharalis
 - Generalist predators



Image credit: Top-Michael Toews, University of Georgia Bottom-Wayne Gardner, University of Georgia

Biological Control



- Eggs parasitized by
 P. saccharalis appear
 abnormally dark colored
- Parasitism rates range from 55 to 95%, most commonly >75%



First Detectors Protecting U.S. from Pests

Image credit: J. Golec, Auburn University

Cultural Control



Image credits: Phillip Roberts, University of Georgia

Soybean planted in April
 and May experienced
 many more bugs and
 egg masses compared
 to June and July
 planting dates

Infestations are typically greater on field edges



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- United States Department of Agriculture, National Institute of Food and Agriculture (USDA NIFA)
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