

Screening Aid Two-spot Cotton Leafhopper (Cotton Jassid)

Amrasca biguttula (Ishida, 1913)

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The two-spot cotton leafhopper or cotton jassid, *Amrasca biguttula* (Ishida, 1913)(Cicadellidae), is a plant-sucking hemipteran with a native range that extends across much of Asia and Oceania. This pest is spreading rapidly, with growing populations in several African countries, and it has recently been detected in the Caribbean and in Florida, USA. Cicadellidae are small, wedge-shaped insects with piercing-sucking mouthparts. As the common name suggests, adult *A. biguttula* can be recognized by black spots on the anterior of their head and near the apex of the forewing (Fig. 1). Similar to some other Cicadellidae, they are pale green in color and about 2.5mm long.



Fig. 1: Adult *Amrasca biguttula*. USDA photo by Daphne Zapsas.

Adult and juvenile *A. biguttula* cause significant damage to crop plants by inserting their mouthparts into the undersides of leaves and feeding on plant cell contents. This feeding causes a condition called “hopperburn” where leaves wilt and curl and turn yellow, red or brown (Fig 2). Because these leafhoppers are so small, hopperburn may be observed before the insects themselves. In addition to feeding on cotton (*Gossypium hirsutum* L.), these polyphagous pests are known to attack okra (*Abelmoschus esculentus* Moench), eggplant (*Solanum melongena* Wall), sunflowers (*Helianthus annuus* L.) and hibiscus (*Hibiscus sabdariffa* Rottler), as well as many ornamentals in their native range, and table grapes (*Vitis vinifera* L.) in India. If not treated, *A. biguttula* can decrease crop yields by up to 50%. Though not a strong flier, the small size of *A. biguttula* makes it particularly susceptible to either wind- or human-mediated dispersal. Several cotton- or okra-growing states in North America have an appropriate climate for this pest.



Fig. 2: Okra damaged by “hopperburn” by *Amrasca biguttula*. USDA photos by Amy Rodas.

Visual inspection methods for *A. biguttula* include looking for hopperburn (Fig. 2), beating plants into a tray with alcohol (Fig. 3a), or putting a bag over small plant sections (Fig. 3b). Sticky traps may be effective if the populations are large enough. If suspect leafhoppers are encountered, collect enough specimens to ensure that adult males are included in the sample. Immatures do not have distinctive spots (Fig. 5). Only adult male *A. biguttula* can be positively identified morphologically, as dissection of male genitalia is needed for identification. Any small green leafhopper should be submitted for professional identification.



Fig. 3: Methods for collecting *Amrasca biguttula* on damaged okra plants either with a beating pan (a) or with bagging (b). USDA photos by Amy Rodas.

Sorting

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Leaves from cotton, okra, eggplant, sunflower or hibiscus should be visually inspected for hopperburn. Any leaves appearing to be affected should be tapped into a pan with alcohol (preferably ethanol for DNA preservation, but isopropanol is effective at suspending their movement as well) or collected in a bag. Leafhoppers meeting the following requirements should be moved to Level 1 Screening (Page 3):

- 1) Leafhoppers are between 1-3mm long (Fig. 4, 6)
- 2) Leafhoppers have an elongate wedge shape that is similar to the adults depicted in Fig. 6, 7.
- 3) Leafhoppers are pale green (Fig. 4, 5). (This coloration may fade over time or in alcohol (Fig. 6, 7).)



Fig. 4: Underside of okra leaf with *Amrasca biguttula*. USDA photo by Amy Roda.



Fig. 5: Underside of okra leaf with adult *Amrasca biguttula* with visible spots (above), and immature *Amrasca biguttula* without visible spots (below). USDA photo by Amy Roda.



Fig. 6: Wedge body shape of *Amrasca biguttula*. Green color has faded due to storage in isopropanol. Actual size shown circled in bottom right. USDA photo by Paul Langlois.

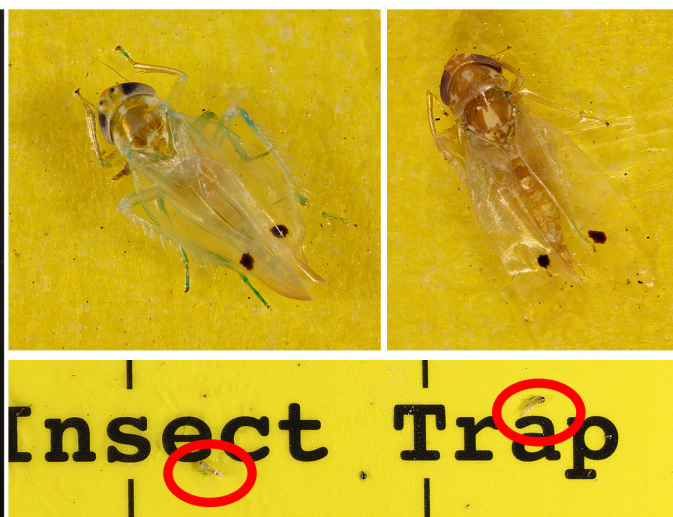


Fig. 7: *Amrasca biguttula* on yellow sticky trap with various degrees of color loss. *Amrasca biguttula* circled in red. USDA photos by Paul Langlois.

Level 1 Screening Two-spot Cotton Leafhopper (Cotton Jassid)

Amrasca biguttula (Ishida, 1913)

The two-spot cotton leafhopper adults can be recognized by the following combination of characters:

- 1) Black spots on anterior of head (Fig. 8, 9, 11). Sometimes obscure or absent.
- 2) Black spots on forewings (Fig. 9, 10, 12, 13).
- 3) Long setae along tibia of hind legs (Fig. 9, 10, 12, 13). Occurs in all Cicadellidae.

Use a hand lens or magnification to screen suspects. Not all *A. biguttula* have spots, and examination of male genitalia is required for positive identification. Any small, green leafhoppers with black spots on wings should be placed in 70% ethanol and clearly labeled before being sent to a trained hemipterist for final identification.



Fig. 8: Head of *Amrasca biguttula* showing black spots on anterior of head. USDA photo by Paul Langlois.



Fig. 9: Dorsal view of *Amrasca biguttula* from St. Croix with some color loss. USDA photo by Paul Langlois.



Fig. 10: Ventral view of *Amrasca biguttula* with color loss. USDA photo by Paul Langlois.

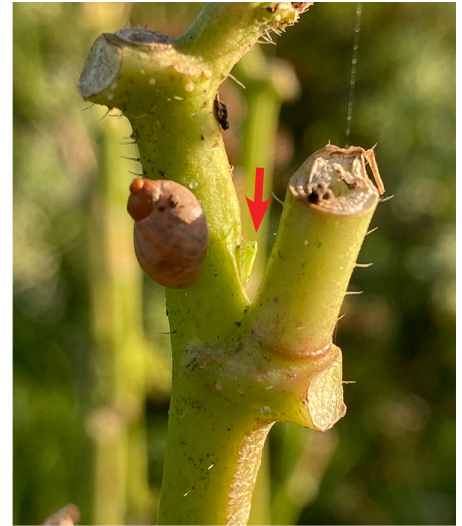


Fig. 11: *Amrasca biguttula* on okra plant in Florida. USDA photo by Amy Roda.



Fig. 12: Lateral view of *Amrasca biguttula* from St. Croix with some color loss. USDA photo by Paul Langlois.



Fig. 13: Lateral view of *Amrasca biguttula*. USDA photo by Daphne Zapsas.

Non-targets

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In North America, several species of leafhopper are similar size and color to *Amrasca biguttula*. The genus *Empoasca* contains many small (2-4mm), green leafhoppers including the potato leafhopper (*E. fabae* Harris, 1841, Fig. 14) and the bean leafhopper (*E. kraemeri* Ross & Moore), which are common in North America, but do not have black spots on the forewings or head. The grape leafhopper (*Hebata (Signatasca) vitis* (Göthe, 1875)) is also small, green and without spots. The white apple leafhopper (*Zonocyba pomaria* (McAtee, 1926), Fig. 15) is similar in size and range, though more yellowish/white in color and does not have black spots. Other North American non-targets include those with black spots on forewings as well as additional coloration, but lacking head spots (*Alconeura* spp. (Fig. 16) and *Kyboasca* spp. (Fig. 17)).



Fig. 14: A common look-alike the potato leafhopper (*Empoasca fabae*) is small and green, but does not have black spots like the two-spot cotton leafhopper. Photo from flickr © Dann Thombs [CC BY-NC-ND 2.0](#).



Fig. 15: The white apple leafhopper (*Zonocyba pomaria*, formerly *Typhlocyba pomaria*) is a similar size as the two-spot cotton leafhopper. However, it lacks the greenish hue and black spots characteristic of *Amrasca biguttula*. Photo from iNaturalist © Solomon V. Hendrix [CC BY-NC 4.0](#).



Fig. 16: Species of *Alconeura* like the sycamore leafhopper (*Alconeura quadrimaculata*) have black spots on their forewing, but do not have black spots on the head. They also have additional markings on the wings and body. Photo from iNaturalist © Joe MDO [CC BY-NC 4.0](#).



Fig. 17: *Kyboasca atrolabes* has black spots on the wings with coloration that continues to the end of the wing. This species lacks head spots. Photo from iNaturalist © Jason M Crockwell [CC BY-NC-ND 4.0](#).

Citation

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