Pacific Pests, Pathogens & Weeds - Fact Sheets

https://apps.lucidcentral.org/ppp/

Big-eyed bug (370)

Relates to: Biocontrol

Photo 1. Adult big-eyed bug, *Geocoris* species (Fiji).

Photo 2. Adult big-eyed bug, *Geocoris punctipes*, preying on whitefly adults and larvae.

Common Name

Big-eyed bug

Scientific Name

Geocoris species. There are at least 140 species.

Distribution

Worldwide. In Oceania, big-eyed bugs are reported from Australia and Fiji.

Prey

Many kinds of insects are prey, including aphids, leafhoppers, lygus bugs (mirids), mealybugs, thrips, all stages of whiteflies, and the eggs and early-stage larvae of moths. It also attacks mites. The bug is an important predator of cotton pests, e.g., *Helicoverpa* species (corn earworm and tobacco budworm).

In Fiji, it is reported by Swaine (1971)[1] to be "the main enemy of the lantana bug, *Teleonemia scruplosa*, which was introduced ... from Hawaii for the control of this noxius weed".

Symptoms & Life Cycle

The bug is an important predator that hunts for many kinds of insect pests, eggs, nymphs and adults smaller than themselves, as well as mites, that occur in turf, ornamentals and agricultural crops. Eggs are laid singly or in clusters on leaves or stems near potential prey. After hatching, the nymphs pass through five stages before becoming adults, and this takes about 30 days at 25°C, longer at lower temperatures.

Both nymphs (similar to adults but smaller and without wings) and adults are predators, but they can survive on nectar, pollen and honeydew when prey is scarce. They also feed on seeds, e.g., sunflower. Adults live about one month, and during this time the female lays 150-300 eggs.

Big-eyed bugs are about 5-6 mm long, oval, somewhat flattened, broad heads and bulging eyes - a distinguishing characteristic (Photos 1&2). They have piercing-sucking (needle-like) mouthparts used to stab their prey, injecting enzymes, and sucking out the juices.

Geocoris interact with other biological control agents; they attack *Orius* (minute pirate bugs), and are themselves attacked by lacewings,

assassin bugs and spiders. Also, their eggs are parasitised by a Scelionid wasp in the US.

Impact

The bug is effective as a predator and studies have shown that nymphs can eat as many as 1600 spider mites before reaching adulthood, while adults have been reported consuming as many as 80 per day. Studies have also found that these bugs are effective in greenhouse crops. Although big-eyed bugs can survive by feeding on plants, they do not cause significant injury.

Detection & inspection

Look for fast moving bugs, 5-6 mm long, grey, brown or yellowish, with long needle-like mouthparts, broad heads and very large eyes. Generally, they occur in low-growing plants of field crops. Look for the forewings, one crosses over the other, forming a triangular pattern pointing towards the rear of the insect (Photo 1).

Management as Biocontrol Agents

Studies have shown that cover crops, e.g., crimson clover and vetch assist populations of the bug in North America. To take advantage of this, cash crops are interplanted with the clover, and as the clover dies the bugs migrate into the cash crops. Whether this is likely to occur in the wet tropics is not clear. Another suggestion is to plant sunflowers to sustain populations of the bug when prey populations are low.

It is important to preserve populations of *Geocoris* by avoiding the use of broad spectrum pesticides; instead, test the usefulness of biopesticides: i) microbial pesticides in which a bacterium, fungus or virus is the active ingredient [e.g., spinosad, Bt *(Bacillus thuringiensis)*, *Beauvaria bassiana*]; ii) botanical pesticides (neem, garlic); iii) biochemical pesticides e.g., sex pheromones that attract insects to traps; or, and where permitted, iv) plant-incorporated protectants, i.e., plants that are genetically modified to produce substances that kill insects (e.g., Bt proteins) .

Interestingly, *Geocoris punctipes* showed no ill-effects either indirectly when feeding on pests reared on cotton and maize genetically engineered to contain Bt proteins, or directly through plant feeding.

AUTHOR Grahame Jackson & Mani Mua

[1]Information from Swaine G (1971) *Agricultural Zoology in Fiji*. Her Majesty's Stationery Office. London; and Mead FW (2017) Featured Creatures: Big-eyed bugs (of Florida). UF/IFAS, University of Florida. (http://entnemdept.ufl.edu/creatures/beneficial/bigeyed_bugs.htm); and *Geocoris* spp. Biological control. Cornell University, College of Agriculture and Life Sciences. (https://biocontrol.entomology.cornell.edu/predators/Geocoris.php); and from Hooks CR *et al.* Big-eyed bug: A MVP of generalist natural enemies. Department of Entomology, University of Maryland. (https://extension.umd.edu/sites/extension.umd.edu/files/_docs/programs/mdvegetables/Geocoris.pdf). Photo 2 Jack Dykinga, ARS image gallery, USDA. (http://www.sel.barc.usda.gov/selhome/gbu/geocoris.html).

Produced with support from the Australian Centre for International Agricultural Research under project HORT/2016/185: *Responding to emerging pest and disease threats to horticulture in the Pacific islands*, implemented by the University of Queensland and the Secretariat of the Pacific Community.
