

# Big-eyed Bugs in Connecticut Lawns

DENNIS M. DUNBAR

The big-eyed bugs, *Geocoris bullatus* (Say) and *Geocoris uliginosus* (Say), are often found in lawns in Connecticut and are frequently mistaken for the hairy chinch bug, *Blissus leucopterus hirtus* Mont. People bring big-eyed bugs to the Entomology Department each summer and ask if they cause damage to grass. This circular reports on their biology and the results of laboratory and field tests conducted to determine if they damage lawn grasses. Photographs and descriptions are also included to assist the reader in distinguishing between these two insects which resemble one another and often occupy the same habitats.

## History and Distribution

Big-eyed bugs (*Geocoris* spp.) were first described in 1803 and subsequently more than 240 species have been described throughout the world (Slater 1964). Twenty species occur in the United States, but only two species, *G. bullatus* and *G. uliginosus*, occur in Connecticut

Lawn damaged by chinch bugs. Big-eyed bugs are often found in areas such as this.



(Britton 1923). Both species have been found in Canada, Mexico, and throughout the United States. They prefer sunny, hot, and dry habitats such as sandy banks along the shores of Long Island Sound (Caplan 1964), grassy banks along roadsides, and in lawns damaged by chinch bugs, disease, or drought (see cover photo).

#### Life History

Life histories of various species have been reported by Champlain and Sholdt (1966, 1967) and Dunbar (1971). Adult males and females overwinter in cracks in the soil, under plant refuse in fields, or in material bordering fields. Mating and oviposition occur in the spring. Females oviposit for periods up to 60 days and deposit as many as 450 eggs. Eggs are deposited individually in protected sites around the base of plants, in hollow stems, or under plant litter on the ground. Eggs hatch in 5 to 10 days. Nymphs occupy the same habitat as adults and require 2 to 4 weeks to complete their development. Adults and nymphs can be found in the field from June through fall.

#### Feeding Habits

Big-eyed bugs are regarded as predators on insect eggs, spider mites, plant bugs, leafhoppers, aphids, and larvae of several species of Lepidoptera (Stoner 1970, Dunbar 1971). They are important biological control agents of cotton pests in California and other agricultural areas in the United States (van den Bosch and Hagen 1966, Butler 1967). In Connecticut, they have been observed feeding on spider mites, springtails, small flies, chinch bug nymphs, and other big-eyed bugs. Slater (1971) has observed them feeding on chinch bug adults. He suggests that big-eyed bugs migrate into lawns damaged by chinch bugs and feed upon them. As a result, chinch bugs decline and big-eyed bugs increase. Although more observations are necessary to substantiate this idea, it may explain why large numbers of big-eyed bugs and few chinch bugs are often found in heavily damaged lawns.

Big-eyed bugs also feed on plants. They cannot complete their development on plant food alone, but they do maintain themselves on plants for short periods of time when prey are scarce (York 1944, Stoner 1970). There are no records in the scientific literature of plant damage caused by their feeding activities.

#### Laboratory and Field Studies

Studies were conducted with *G. bullatus* to determine if their feeding injured or killed lawn grasses. In one study, adults were caged on bent grass and their feeding behavior was observed. Three 6-inch clay pots containing bent grass were used. Twenty-five adults were introduced into each of two cages while none was introduced into the third cage.

Bugs were observed over a 14-day period. They were frequently seen feeding on the grass, as well as feeding on one another. Thirteen of the original 50 bugs were recovered alive from the two cages at the end of 14 days. Mortality was high and was likely due to cannibalism and the inadequacy of bent grass as food for the bugs. There appeared to be no differences in the appearance or condition of the grass caged with big-eyed bugs and the grass caged without them.

Another study, similar to the first, was conducted using Merion bluegrass potted in 6-inch clay pots. Fifty adults were introduced into each of two cages while none was placed in the third cage. As in the preceding study, adults were observed feeding on the grass and on each other. There were no differences after 15 days between grass caged with and without bugs. Few adults were recovered alive, indicating that they may have been unable to survive on Merion bluegrass.

A third study with rye grass seedlings potted in 3-inch pots and caged with adult big-eyed bugs produced similar results. Twelve caged pots containing 5 to 7 rye grass seedlings each were used. Eight adults were introduced into each of eight cages. Four cages contained no bugs. Again, cannibalism and plant feeding were observed. The study was discontinued after 10 days because the majority of the bugs had died, indicating that rye grass may also be a poor host for big-eyed bugs. The seedlings in all 12 pots had brownish tips, but otherwise appeared as healthy as when the study was initiated.

A study was conducted in a lawn in Cheshire, Connecticut, during the period from June 20 to July 30, 1971 to determine whether big-eyed bugs killed or injured grass under field conditions. Also, four different insecticides commonly used in lawns for chinch bug control were tested against big-eyed bugs. A pretreatment count on June 30 indicated 11.3 bugs per sq. ft. There were many dead or dying areas throughout the lawn and big-eyed bugs were easily seen in these areas. A 10,000 sq. ft. section of the lawn was treated with insecticides and then observed to see if the condition of the grass improved. About 2,000 sq. ft. of lawn were not treated. Insecticides were applied in granular form with a 16-inch fertilizer spreader on June 30. Each insecticide was applied to 2,500 sq. ft. of lawn at the following rates: 8.75 lbs. of Aspon® 5%; 12.5 lbs. of Diazinon® 2%; 11 lbs. of Ethion® 5%, and 10 lbs. of Sevin® 5%.

Seven days after treatment all big-eyed bugs in the four treated areas had been killed. The untreated area had an average of 14.0 per sq. ft. Fourteen days after treatment no big-eyed bugs were collected from the treated areas while 10.7 per sq. ft. were collected from the untreated area. The insect population was observed 21 and 30 days after treatment. The untreated area continued to support large numbers of big-eyed bugs; the treated areas had very few.

The condition of both treated and untreated areas improved considerably between June 30 and July 30. The untreated area, which supported large numbers of bugs throughout the period, was as green and

had as much new growth as the treated areas. Several rains came between June 30 and July 30 and it is probable that the lawn responded to the increased moisture. This is likely because a neighboring lawn was heavily infested and damaged by chinch bugs during the same period and even after the rains its appearance did not improve.

### Conclusions

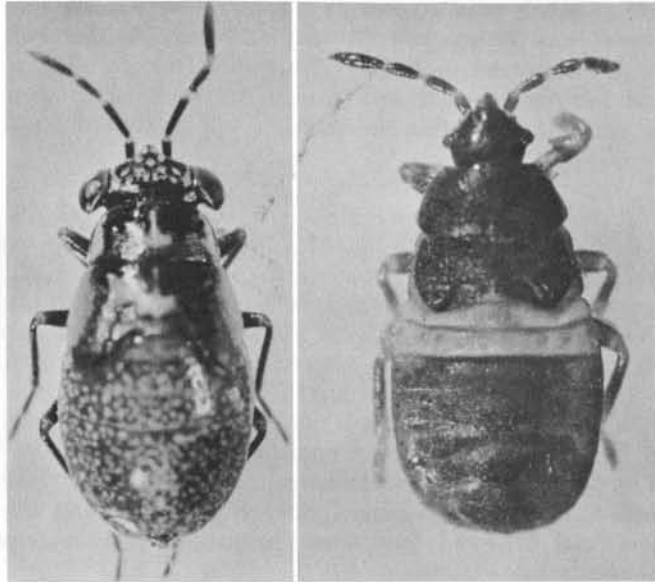
*G. bullatus* feeds on, but does not naturally injure bent, Merion blue, and rye grasses. Also, big-eyed bug mortality was high when they were caged on these grasses. The results of the field study showed that Aspon Diazinon, Ethion, and Sevin each gave excellent control of big-eyed bugs, but there were no noticeable differences in growth of grass between the treated and untreated areas.

We conclude at this time that big-eyed bugs are not causing damage to lawn grasses but are predators upon other insects found in lawns. It will behoove anyone who suspects that his lawn is infested with chinch bugs to learn the difference between the pestiferous chinch bug and the beneficial big-eyed bug. The illustrations and description that follow should help.

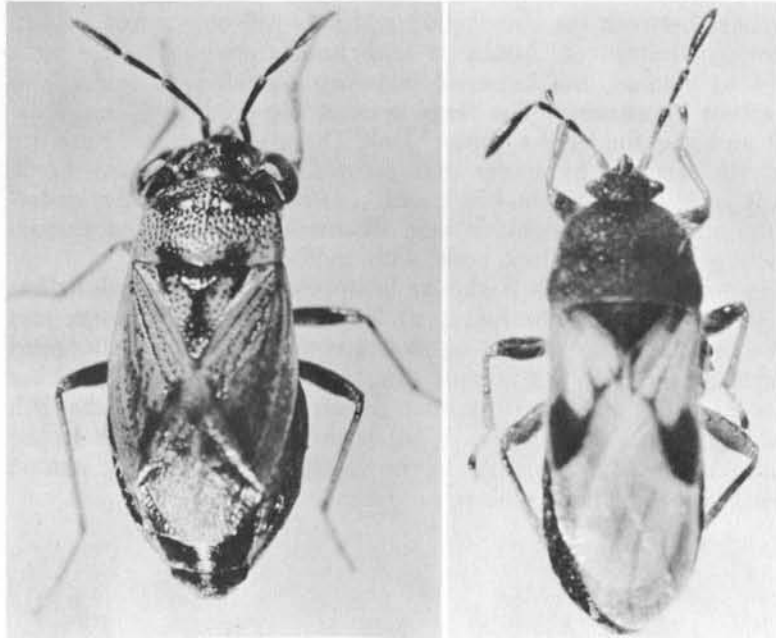
### Identification

Differences between the chinch bug and big-eyed bug are evident in the following illustrations. Adults of both insects are nearly the same length (4 to 5 mm), but big-eyed bugs are considerably wider and have a robust appearance. The large eyes of big-eyed bugs are characteristic and give the head a "blunt" look. The eyes of chinch bugs are tiny and the head is triangular and pointed. Body coloration in *G. bullatus* is generally brownish-black with a reddish tinge on the underside of the abdomen. The chinch bug, *Blissus leucopterus*, has characteristic white wings and black body with reddish legs.

The big-eyed bug nymph is similar in appearance to the adult, but without wings. It has a bluish-gray abdomen with a dark thorax and head. The characteristic protruding eyes are quite evident in big-eyed bug nymphs. The chinch bug nymph is bright red early in its life and has a white band across its back. It becomes darker as it grows until the fifth nymphal stage when it is practically black and has a white spot on the back between the wing pads. As in the adult, the chinch bug nymph has a small triangular head with small eyes.



Nymph of the big-eyed bug, left, and of the chinch bug.



Adult of the big-eyed bug, left, and of the chinch bug.

*Insect photographs by George Schuessler*

#### References Cited

- Britton, W. E. 1923. Guide to the insects of Connecticut. Conn. Geol. and Nat. Hist. Survey. Bull. No. 34.
- Butler, G. D. 1967. Big-eyed bugs as predators of *Lygus* bugs. Prog. Agr. Ariz. 19(1): 13.
- Caplan, I. 1964. Some chinch bugs aren't. New York State Turfgrass Assoc. Bull. No. 78: 302.
- Champlain, R. A. and L. L. Sholdt. 1966. Rearing *Geocoris punctipes*, a *Lygus* bug predator, in the laboratory. J. Econ. Entomol. 59(2): 1301.
- Champlain, R. A. and L. L. Sholdt. 1967. Life history of *Geocoris punctipes* (Hemiptera:Lygaeidae) in the laboratory. Ann. Entomol. Soc. Amer. 60(5): 881-83.
- Dunbar, D. M. 1971. The biology and ecology of *Geocoris atricolor*, *G. pallens* and *G. punctipes*. Ph.D. thesis. University of California, Davis. 99 p.
- Slater, J. S. 1964. Catalogue of the Lygaeidae of the World. Vols. I and II. Univ. of Conn. Press.
- Slater, J. S. 1971. Personal communication. Univ. of Conn.
- Stoner, A. 1970. Plant feeding by a predacious insect, *Geocoris punctipes*. J. Econ. Entomol. 63(6): 1911-15.
- van den Bosch, R. and K. S. Hagen. 1966. Predacious and parasitic arthropods in California cotton fields. Calif. Agric. Expt. Sta. Bull. 820. 32 p.
- York, G. T. 1944. Food studies of *Geocoris* spp., predators of the beet leafhopper. J. Econ. Entomol. 37(1): 22-29.