

DESCRIPTION

Conchuela stink bug (*Chlorochroa ligata*) is the stink bug most commonly found in New Mexico cotton. It has a wide distribution, but is not common outside of the arid/semi-arid western United States and Mexico. It is a very common insect in New Mexico, far West Texas, and parts of Mexico, but is only occasionally an economic pest of cotton in New Mexico.

Conchuela stink bug, like southern green stink bug, is relatively large, with females and males averaging 15 and 14 mm long, respectively. Coloration is dark olive green to black with a distinctive red border and a red spot near the tip of the abdomen (Figure 1). Immature stink bug nymphs have no wings and are more rounded in appearance, but have coloration similar to adults.

BIOLOGY

Each female lays an average of 2.4 eggs per day (150 total eggs during her lifespan) in clusters of 30 to 80 eggs on either the top or underside of leaves. Eggs are shaped like small barrels 1 mm in diameter and 1.3 mm tall. They are pale green initially and turn white after one day, then gray/brown as the embryo develops. In midsummer, eggs hatch in seven days. However, when temperatures dip below 74°F, egg development is delayed. Egg laying also decreases with falling temperatures, with few eggs laid when the mean temperature drops below 75°F. Each of the five nymphal instars (developmental stage between each molt) lasts 5 to 7 days. The total time from egg to adult is approximately 35 days. The average lifespan for adults is not clear, but they commonly live more than 70 days.



Figure 1. Adult conchuela stink bug. (Whitney Cranshaw, Colorado State University, Bugwood.org)

Conchuela stink bug overwinters in the adult stage, often in rangeland, in clump grasses, or under rocks. Overwintered adults emerge in the spring, begin feeding, then mate and lay eggs. It has a wide host range, but prefers seeds and fruits. In desert/rangelands, it strongly prefers mesquite, and can be seen during the summer in large clusters hanging off mesquite seed pods. After mesquite pods harden off, adults disperse, looking for new hosts. Silverleaf nightshade (*Solanum elaeagnifolium*) is highly preferred, but among agricultural

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crops, alfalfa seed or headed out sorghum is favored over cotton. More lush fields are also favored for feeding. Most years, this pest is more prevalent in field margins, but when populations are high, it can be found throughout the field. This stink bug is gregarious in nature, so frequently more than one adult will be found feeding on one boll.

Conchuela stink bug may be seen early in the morning basking out in the open on cotton plants or the sides of farm buildings. They have a tendency to aggregate and communicate with each other for courtship or rivalry purposes, making small vibrating sounds by rapidly tapping the plant surface. Like many insects, they also use pheromones to attract mates, but trapping with pheromone baits has not yet been very successful. Adults are strong fliers, but nymphs cannot fly and are not likely to successfully migrate far if a host plant like mesquite becomes unacceptable.

DAMAGE

Conchuela stink bug was first reported as a pest in 1902 when it caused heavy losses on a 30,000-acre farm in the Laguna district in the state of Coahuila, Mexico. In 1904 and 1905, significant losses were reported in seed alfalfa near Barstow in far West Texas. In the last few decades, damage has been less severe. Like other true bugs, conchuela stink bug has piercing/sucking mouthparts. It damages cotton by piercing bolls and feeding on the developing seed, sometimes remaining and feeding on one boll for more than a day. It does not feed on cotton squares. Feeding on small bolls usually causes the bolls to abort. Larger bolls develop warts inside the boll as a result of feeding and sometimes develop dark spots on the outside where feeding occurred. Feeding injury does not always result in external spots, so the absence of spots outside the boll does not necessarily indicate a lack of damage. Feeding injury may significantly reduce lint production. Each stink bug can produce an average loss of 1 3/4 bolls per day.

Injury to bolls, from any insect, is more worrisome than injury to squares, since there is a greater investment of the plant and less opportunity to compensate for injury. However, some losses of small aborted bolls can be sustained without significant yield loss, particularly late in the season. A loss

of one small boll per plant in late July or August in New Mexico is unlikely to produce significant yield losses. Feeding on larger bolls is a much greater concern, and aggressive treatment is warranted. Significant feeding on larger bolls will result in hard-lock bolls that fail to open—a direct yield loss. Feeding on larger bolls will also usually cause lint staining near the feeding site. Stink bugs may also introduce bacteria into the boll and produce boll rot.

CULTURAL CONTROL

Fields that border rangeland are more likely to be infested. Removing mesquite near cultivated fields was an early recommendation, and had some success in the early 20th century. Monitoring the presence of conchuela stink bug in mesquite and tracking the stage of development of mesquite seed pods will help predict possible movement into crops. Like many insect pests in New Mexico, conchuela stink bug seems more likely to be a problem in years with higher rainfall and humidity, perhaps due to a reduction in natural mortality from desiccation. Heavy rains can cause some mortality, particularly of nymphs.

BIOLOGICAL CONTROL

Four species of egg parasitoids have been recovered from conchuela stink bug eggs. One parasitoid, *Telenomus ashmeadi*, routinely kept conchuela stink bug from reaching economic levels in the early 20th century. The four species typically provided 65 to 75% control. A tachinid fly, *Gymnosoma fuliginosa*, is the only known parasitoid that attacks adults and nymphs. However, it did not provide more than 5% control.

Generalist predators that readily consume eggs from moths likely also consume stink bug eggs, and perhaps some nymphs and adults as well. The only documented predator of nymphs is an assassin bug, *Zelus renardii*, which can consume up to four nymphs per day. Other generalist predators that might have an impact include various species of spiders, damsel bugs, ladybug adults and larvae, green lacewing larvae, big eyed bugs, and minute pirate bugs. Alfalfa is an important source of these predators in New Mexico. Cutting reduces populations of predators in alfalfa hay. Maintaining some refuge

foliage will help maintain populations of predators that control pests, not only in hay but also in other nearby crops, including cotton. Birds are thought to provide some control of adult conchuela stink bug.

SAMPLING

To sample for conchuela stink bug, put one arm behind 3 row feet of cotton and shake plants vigorously. Check for stink bugs that fall to the ground. Take 4 to 6 samples from 4 to 6 locations, but bear in mind that conchuela stink bug may be concentrated in the field margins, particularly the sides adjacent to rangeland. Treatment decisions should be based on boll damage. Bolls may be injured without external signs of damage, so it is important to open bolls. Remove 25 small bolls (about quarter-sized) from each of four areas of the field. Cut open the bolls and examine for signs of wart-like growths or staining. Treatment is recommended when there is at least one stink bug per 6 row feet, or when 10% or more of bolls have damage, stink bugs are still present, and there is time to mature a significant number of small bolls. When cotton has reached 5 nodes above white flower (450 DD after cutout), stop sampling since there is not enough time for these bolls to mature before harvest. Keep in mind that conchuela stink bug is often concentrated at the field margins when sampling. Some growers have had success in treating only these margins.

REFERENCES

- Bagwell, G., A. Cokj, J. Millar. 2008. Characterization and comparison of substrate borne vibrational signals of *Chlorochroa uhleri*, *Chlorochroa ligate* and *Chlorochroa sayi* (Heteroptera: Pentatomidae). *Annals of the Entomological Society of America*, 101, 235-246.
- Morrill, A.W. 1907. Description of a new species of *Telenomus* with observations on its habits and life history. *The American Naturalist*, 41, 417-430.
- Morrill, A.W. 1910. *Plant-bugs injurious to cotton bolls* [Bulletin 86]. Washington, D.C.: U.S. Department of Agriculture, Bureau of Entomology.



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