

Conchuela Stink Bug in New Mexico Cotton

Revised by J. Breen Pierce¹

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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.



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

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 New Mexico, eggs generally hatch in 5–7 days during the growing season. Egg development is delayed by slight changes in temperature. At 74–79°F, eggs hatch in 5–7 days, but take 16 days to hatch at 72°F. Warmer temperatures speed egg development, with eggs hatching in only 3.5 days at 83°F.

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There is no data on high temperatures, but desiccating conditions—a combination of high temperatures and low relative humidity—can prevent egg hatch. Egg laying also decreases with falling temperatures. Females lay 3.0–3.4 eggs per day at 78–82°F, but only 0.5 per day at 75°F. The total time from egg to adult is approximately 35 days, with the five nymphal instars (development stage between each molt) lasting five to seven days each. The average lifespan for adults is not clear, but they commonly live more than 70 days.

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, and then mate and lay eggs. It has a wide host range, but prefers seeds and fruits. In deserts/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 crops, alfalfa seed or headed out sorghum is favored over cotton. More lush fields are also favored for feeding. In 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 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 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 in New Mexico, but lower insecticide use in Bt cotton cultivars and less frequent scouting might result in higher potential for damage.

Like other true bugs, conchuela stink bug has piercing/sucking mouthparts. It damages cotton by piercing bolls and feeding on the developing seed. It does not feed on cotton squares. Feeding on small bolls (less than 10 days old) 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 small bolls per day. While the stink bug might feed on larger bolls 25 days old, such feeding will generally not produce any yield losses.

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, less than 10 day old boll per plant in late July or August in New Mexico is unlikely to produce significant yield losses (Pierce and Monk, 2007a). Feeding on older bolls is a much greater concern, and more aggressive treatment may be warranted. Significant feeding on these developing bolls will result in hard-lock bolls that fail to open—a direct yield loss. Other signs of damage are lint staining near the feeding site and potentially boll rot from bacterial contamination from conchuela stink bug feeding.

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 can help predict possible movement into crops.

Like many insect pests in New Mexico, conchuela stink bug seems to be a more frequent problem in years with higher rainfall and humidity. This is likely due to less control or natural mortal-

ity from desiccation. Lower relative humidity and high temperatures are associated with lower egg hatch for many species of insects with, for example, only 4% egg hatch of bollworm eggs under high temperatures and low relative humidity (Pierce and Monk, 2007b). Cutworm has also had outbreaks in New Mexico when relative humidity is high and temperatures are low.

BIOLOGICAL CONTROL

Four species of egg parasitoids have been recovered from conchuela stink bug eggs. The four species typically provided 65 to 75% control. One parasitoid, *Telenomus ashmeadi*, routinely kept conchuela stink bug from reaching economic levels in the early 20th century. A tachinid fly, *Gymnosoma fuliginosa*, is the only known parasitoid that attacks adults and nymphs. However, it does 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, but 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 also provide some control of adult conchuela stink bug.

SAMPLING

To sample for conchuela stink bug, put one arm behind three row feet of cotton and shake plants vigorously. Check for stink bugs that fall to the ground. Take four to six samples from four to six 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 six row feet, or when 10–20% of quarter-sized bolls have damage, internal warts, and stained lint. This level of damage is enough to justify treatment if stink bugs are still present, and there is time to mature a significant number of small bolls. When cotton has reached five nodes above white flower (450 growing degree days 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. Growers have had success in treating only those margins.



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