

Green June Beetle

Biology, Damage and Control

Fran Pontasch – Texas AgriLife Extension Service, Stephenville
Allen Knutson – Texas AgriLife Extension Service, Dallas

The adult green June beetle (GJB) has many monikers. It is often called a Green Metallic Beetle, Japanese Beetle, and June Beetle and so on; however, the official common name is green June beetle. The green June beetle is in the order Coleoptera, family Scarabaeidae, subfamily Cetoniinae, Genus *Cotinis*. Three species of the genus *Cotinis* occur in Texas. The green June beetle, *Cotinis nitida*, has caused economic loss to vineyards in North Texas, East Texas, the High Plains, and the Hill Country. It is the most common, abundant and economically significant species. The Western Green June Beetle, *Cotinis mutabilis* and the South Texas Coastal Cotinis, *Cotinis boylei* are not known to be pests in vineyards.



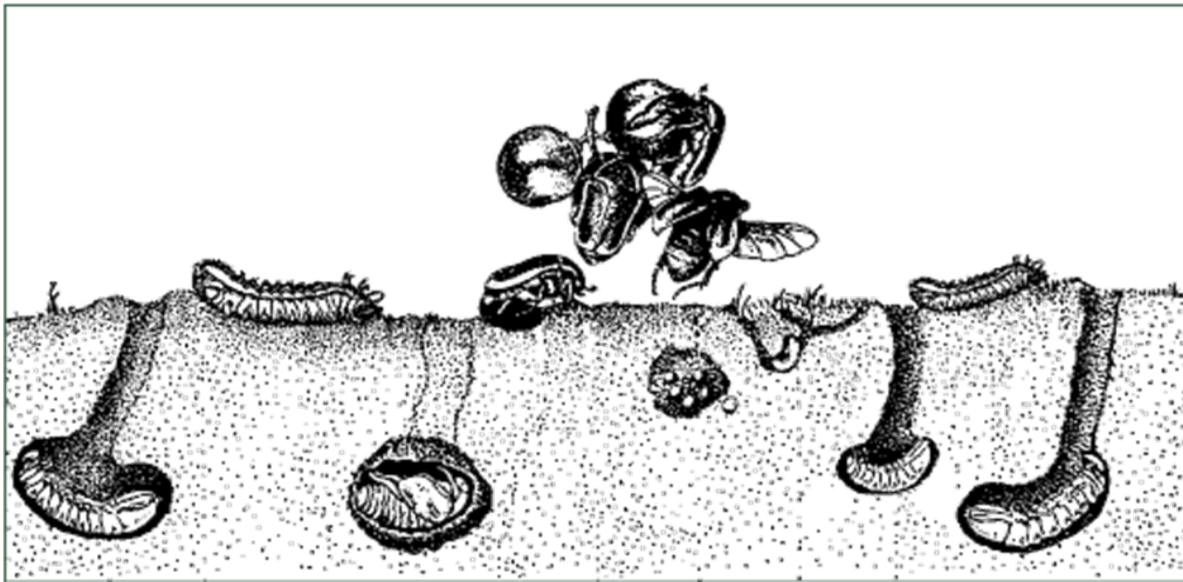
The adult GJB is large, measuring up to one inch in length with metallic green wing covers and margins of light brown to orange yellow. Larger and bulkier than the common June bug or the Japanese beetle, the adult GJB feeds on ripening fruits of many thin skinned crops including grapes, blackberries, raspberries, peaches, pears, plums, apples, and corn. In contrast, its relatives the Japanese and June beetles, feed primarily on leaves.

Behavior. GJB begin flying in search for food after mating, approximately one week after they emerge as adults. GJB are daytime flyers, most commonly flying in morning just as the dew dries and before the sun generates harsh summer heat.

Vineyards (and orchards) with ripening fruit are often GJB targets. The GJB lands on soft, ripening fruit, and begin to open the flesh using their serrated legs and horned head. As GJB feed, they emit volatile aggregation pheromones which attract other GJB. The feeding damage

to grape clusters invites combinations of yeasts to feed on the sugars as they accumulate within the ripening berries. The damage and subsequent fermentation can often go unnoticed by humans, but the aroma is attractive to the GJB. Thus, the aroma of the fermenting fruit mixed with the aggregation pheromones is irresistible for both male and female GJB. GJB gorge en masse on ripening clusters in a feeding frenzy that continues for approximately 3 weeks until harvest when winegrapes reach full maturity. Damage spreads as entire clusters are consumed and GJB colonize the vineyard. Unpleasant GJB excretions give the final wine product an objectionable flavor.

JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



Life cycle of the green June beetle.
 Flanders, K., P. Cobb. 2000. Alabama Cooperative Extension.

Lifecycle. The GJB completes one generation per year. The GJB is in the pupa stage and underground for several weeks from May to midsummer. Beetles (adults) emerge from the soil in June to July and emergence is often triggered by rain. Upon emergence, the adult GJB seeks a mate. Females deposit eggs in sites containing decomposing manure and organic matter, such as pastures and hayfields. Females then lay 10-30 eggs in balls of soil. GJB eggs hatch as larvae in 2-3 weeks. During the day, larvae hide in vertical tunnels in the soil. At night, they emerge from their tunnel and crawl about the soil surface, feeding on animal manure and other decaying organic matter. The larvae crawl on their backs; their small legs are not useful for locomotion. The habit of crawling on its backs is specific to a GJB larva. During the winter, larvae are inactive but may crawl from their tunnels to feed on warm days. The larvae become active in February and continue to feed during the spring. In May, larvae are full grown (1.5 – 2 inches long) and then burrow underground once more to pupate, emerging in June and July as adults.

The tunneling of GJB larvae makes them a recognized insect pest to turf grass. Adult populations peak in July and August in Texas, coinciding with grape berry maturation.

Management Options. Green June beetles are most abundant in the vineyard during the approximately 3 week period from when winegrapes reach accumulated sugars of about 19+°Brix and until grapes are harvest ready. Having their peak presence near harvest makes adult GJB difficult to control. Carbaryl insecticide (Sevin 4F) is labeled for application to grapes and can be applied for green June beetle control. Sevin 4F, applied at a rate of 2 quarts per acre, was rated highly effective for GJB control in tests in Arkansas (Johnson 2009). It is effective when applied at full label rate when GJB adults are first detected in a vineyard. Sevin should be applied again if GJB continue to infest the orchard. A third treatment may be required to protect late maturing grape varieties or during years when GJB are abundant. Label restrictions on the use of Sevin state: do not apply Sevin 4F more often than every 7 days, no more than 5 times during the season and do not apply within 7 days of harvest.

Managing GJB with insecticides as part of a mass trapping “Attract and Kill” method of control has been evaluated in Texas by Texas AgriLife Extension (Knutson et al. 2009) and in Arkansas (Johnson et al. 2009). Trials in Texas found traps captured large numbers of GJB but it was still necessary to apply Sevin insecticide to protect grapes from GJB damage. Traps placed around the vineyard may help reduce numbers of GJB but further research is needed to develop this method as a reliable control practice.



Traps are non-invasive and effective in detecting early and peak presence of GJB in a vineyard. Densities of the local GJB populations in the area surrounding individual vineyards are unknown and dependent upon distance and size of nearby breeding sites. There is also concern, as with any mass-trapping program, that a large number of traps may attract more pests into a crop than might otherwise occur. It is not known whether traps attract GJB already flying into a vineyard or attract GJB from surrounding areas. Since traps do not capture all pests, there may be a potential to increase the pest density.

All of the current information suggests that GJB larvae develop in pastures and hayfields high in animal manure and organic matter, and there is no evidence that significant numbers of GJB

larvae develop in soil in vineyards. However, if piles of decaying vegetation (compost) are present in the vineyard, they may be attractive to GJB as egg laying sites.

Since green June beetles fly into vineyards from surrounding areas, the key to GJB management is preventing GJB adults from colonizing a vineyard. Management of GJB requires frequent scouting of the vineyard to detect when GJB first begin to fly into the vineyard and begin feeding on grapes. Once GJB are present in damaging numbers, carbaryl (Sevin) insecticide should be applied without delay to reduce crop loss and the attraction of additional GJB into the vineyard. Growers should continue to scout the vineyard for re-infestation by GJB and re-apply the insecticide if necessary. Provado is labeled specifically for control of GJB in Texas. However, imidacloprid, the active ingredient of Provado, is the principal insecticide for managing Pierce's Disease vectors. An increase in use of imidacloprid for GJB control would increase the selection pressure for the PD vectors to develop resistance to imidacloprid. To help preserve the effectiveness of imidacloprid to Pierce's Disease vectors, Texas AgriLife Extension suggests growers consider using carbaryl for GJB control if imidacloprid is being applied for control of Pierce's Disease. We continue to evaluate possible GJB management options, and will provide dependable updated information when available.

REFERENCES

Chittenden, F. H. and D. E. Fink. 1922. Green June beetle. USDA Agric. Bulletin 891:1-52.

Domek, J.M. and D.T. Johnson. 1988. Demonstration of semiochemically induced aggregation in the green June beetle, *Cotinis nitida* (L.) (Coleoptera:Scarabaeidae). Environ. Entomol. 17:147-149.

Flanders, K.L. and P.P. Cobb. 2000. Biology and Control of the Green June Beetle. Alabama Cooperative Extension System. ANR-991.

Goodrich, M. A. 1966. A revision of the genus *Cotinis* (Coleoptera: Scarabaeidae). Annals of the Entomological Society of America 59:550-568.

Johnson, D. T., et al. 2009. Green June Beetle Mass Trapping and Efficacy Studies.
<http://entomology.uark.edu/3928.htm>

Knutson, A., F. Pontasch, and D. Johnson. 2009. Evaluation of mass trapping adults as a control for green June beetle attacking winegrapes in North Texas. Texas AgriLife Extension Service report. 7 pp.

Riley, E.G. Associate Curator - Texas A & M University Insect Collection.
Texas A& M University System Entomology Department.