

Guava Pests and Beneficial Insects¹

Daniel Carrillo, Jorge Peña, and Rita Duncan²

The guava is subject to attack by several kinds of insects. Among the more important are guava whitefly, red-banded thrips, guava fruit moth, Caribbean fruit fly, mealybugs and several species of scales. Detailed life history and effective control measures for most of these pests still remain to be worked out.

Recommendations for effective control of insect pests are limited because only a few insecticides have been registered for use on guava. Some of these are not approved for use when fruit is present. Some of the most effective materials have not been approved. At the present time, EPA listings indicate that Pyrellin, Provado, Spin Tor 2SC, Azatin, Mycrotrol, Malathion, Logic, Endeavor, Surround, Esteem, Extinguish, Amdro, Knack, Floramite, Tame, Savey, Talstar, insecticidal soap, *Bacillus thuringiensis*, and Pyrenone are insecticides that are registered for use on guavas. *Bacillus thuringiensis* (Dipel) 2X, 4L is labeled for use on hornworms, leafrollers, omnivorous loopers, and loopers.

The user must read the label carefully for more specific details on use. The local UF/IFAS Extension office or farm chemical dealers may be able to provide more specific details on pest control materials.

Insects on Flowers and Fruits

Guavas are a crop in which very little is known about the control measures concerning pests that attack them. It is the responsibility of the grower to take utmost care in selecting pesticide materials that are labeled for use in this crop. Even though certain insecticides are approved by the EPA for use on guavas, only certain labels that contain these specific insecticides may have guavas listed. If further information is needed contact your local UF/IFAS Extension agent.

Under the FIFRA amendment of 1978 the grower may use a material (insecticide) that is legal and EPA approved for a pest on a crop for other non-listed pests as long as the user follows the label directions and rates for the approved pest.

The following materials are legal for use on guava in Florida (see Table 1):

- ***Bacillus thuringiensis*** (several trade names)—for use against certain Lepidopterous caterpillars.
- **Pyrellin** (pyrethrins + rotenone)—for use against aphids, caterpillars, fruit-flies, leafhoppers, mites, thrips, weevils, and whiteflies at 1–2 pts per acre. No waiting period to harvest.

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2. Daniel Carrillo, assistant professor; Jorge Peña, professor emeritus; and Rita Duncan, biological scientist, Department of Entomology and Nematology; UF/IFAS Tropical Research and Education Center, Homestead, FL 33031.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition. Use pesticides safely. Read and follow directions on the manufacturer's label.

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- Pyrellin, Provado, Spin Tor 2SC, Azatin, Mycrotrol, Malathion, Logic, Endeavor, Surround, Esteem, Extinguish, Amdro, Knack, Floramite, Tame, Savey, Talstar

Caribbean Fruit Flies

The Caribbean fruit fly, *Anastrepha suspensa* (Loew), is also called the Caribfly and guava fruit fly. The adults are small yellow-brown flies 1½ to 2 times larger than a house fly, with rather long, patterned wings (Figure 1A and B). Eggs are laid singly and hatch in about 2–3 days. The larval period lasts 10–14 days (Figure 2), and pupation is in the soil under the tree (Figure 3); adults emerge after 15–19 days. These stages are prolonged in cool weather. A parasitoid *Diachasmimorpha longicaudata* (Figure 4) was introduced into Florida from Mexico and Hawaii in 1972 by Baranowski to decrease the fruit fly populations, and it can still be found attacking Caribbean fruit fly. These parasitoid wasps reproduce by laying their eggs inside fruit fly larvae. They are associated with symbiotic viruses (rhabdoviruses) that alter host metabolism and development to promote successful development of the wasp embryo. In the case of *D. longicaudata*, this virus is present some of the time, but not required for successful parasitism.

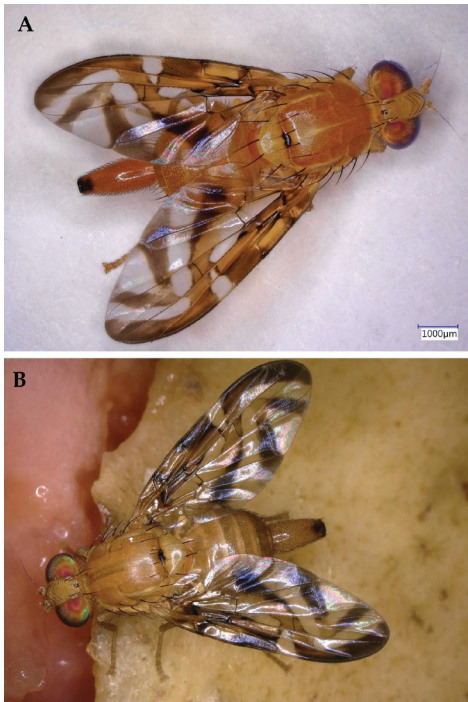


Figure 1. A) Adult female Caribbean fruit fly, *Anastrepha suspensa*. B) Adult female Caribbean fruit fly, *Anastrepha suspensa* feeding on a guava fruit.

The Caribbean fruit fly infests mostly mature to overripe fruits (Figure 5). Infested guava fruit show signs of fruit fly feeding, and the fruits are softer on one side. Larvae can be seen tunneling through the pulp.



Figure 2. Larva of the Caribbean fruit fly, *Anastrepha suspensa*.



Figure 3. Parasitized pupae of the Caribbean fruit fly, *Anastrepha suspensa*.

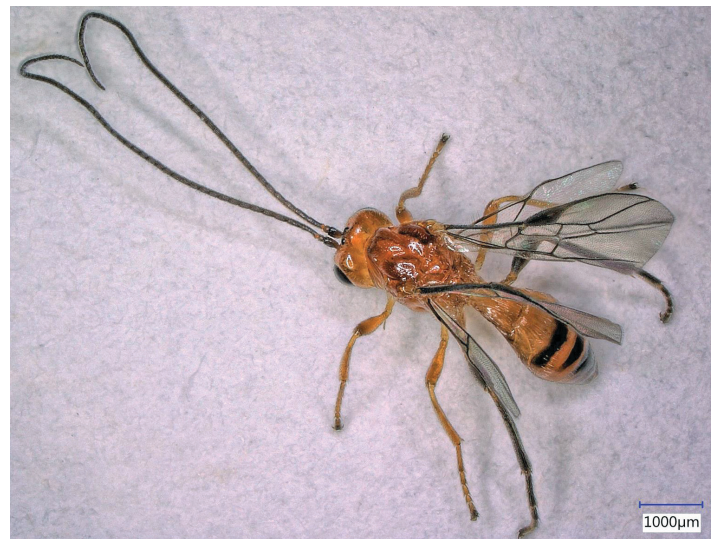


Figure 4. *Diachasmimorpha longicaudata*, a Hymenopteran parasitoid emerged from Caribbean fruit fly, *Anastrepha suspensa*.



Figure 5. Emergence holes from Caribbean fruit fly in a guava fruit.

Moths and Caterpillars

Larvae of the guava fruit moth may cause considerable damage to guava by tunneling through the fruit. The larvae are whitish in color with a black head. They become pink as they approach maturity and attain a length of nearly $\frac{1}{4}$ inch. Satisfactory control measures have not been developed. Fruit that ripens first is less likely to be infested than that which ripens later; consequently, utilize early fruit and harvest as it matures.

The greenish caterpillar, *Strepsicrates smithiana* webs tender leaves together and pupates on the leaves. It is observed periodically throughout the year, without showing a definitive infestation trend (Figure 6 A–C).

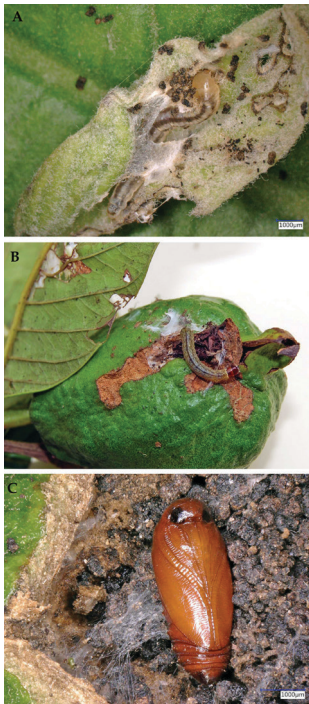


Figure 6. A) Caterpillars damaging guava buds. B) Caterpillars damaging young guava fruit. C) Pupa of moth on a guava fruit.

Mealybugs

The coconut mealybug, *Nipaecoccus nipae* (Makell) is regularly observed in late autumn and early winter. The adult female mealybugs are white, about 3 mm long, and covered with a white, mealy wax. The mealybug shelters in the leaf axils, but they also move onto fruit and settle under the calyx or between fruit that are touching (Figures 7 and 8).



Figure 7. *Nipaecoccus floridensis*, the Florida coconut mealybug. Identification by G. Hodges 23 Jan 2009.



Figure 8. *Nipaecoccus floridensis*, the Florida coconut mealybug with immatures. Identification by G. Hodges 23 Jan 2009.

Scales

Hemiberlesia lataniae (Figure 9) is one of several scales that can be found infesting guava fruits; others are mostly on the leaves but can also invade the fruit when populations increase.

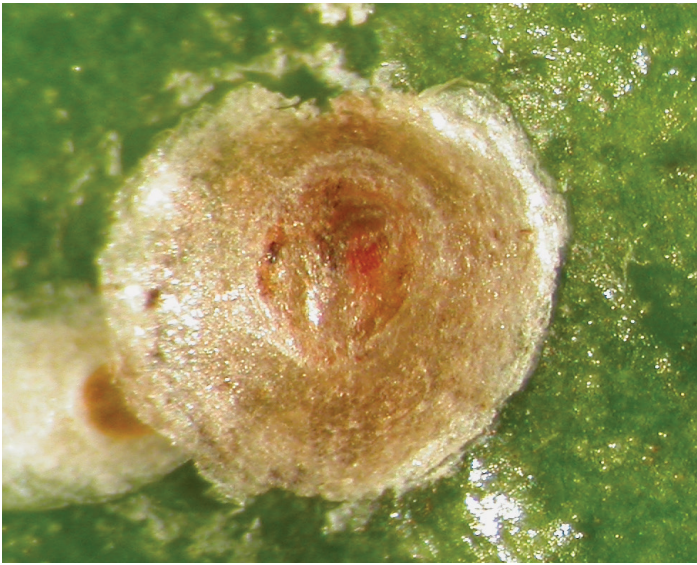


Figure 9. The latania scale, *Hemiberlesia lataniae* on guava fruit. Identified by I. Stocks, 16 Nov 2011.

Leaffooted Bugs

Leaffooted bugs (*Leptoglossus* spp.) are conspicuous insects (20–25 mm long) that make a buzzing sound in flight (Figures 10 and 11). Eggs are laid in a row or chain along a stem or leaves of weeds around the crop or on the crop itself (Figure 12). Ordinarily, leaffooted bugs are considered minor pests, but occasionally large numbers accumulate and cause economic damage. Feeding results in punctures (Figure 13 A and B) that allow pathogens to enter the fruit and cause rotting and may result in fruit drop or distorted, poor quality fruit.

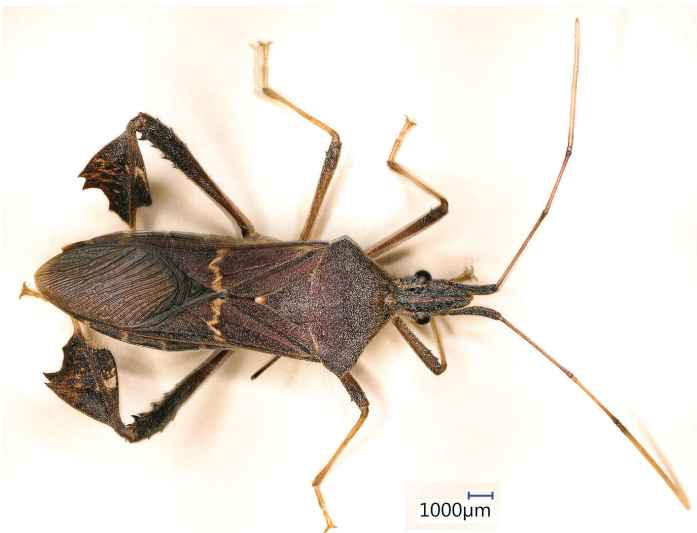


Figure 10. *Leptoglossus concolor*, a leaffooted bug. Identification by S. Halbert, 3 Nov. 2015.



Figure 11. *Leptoglossus phyllopus*, a leaffooted bug. Identification by S. Halbert, 3 Nov. 2015.



Figure 12. Leaffooted bug eggs.

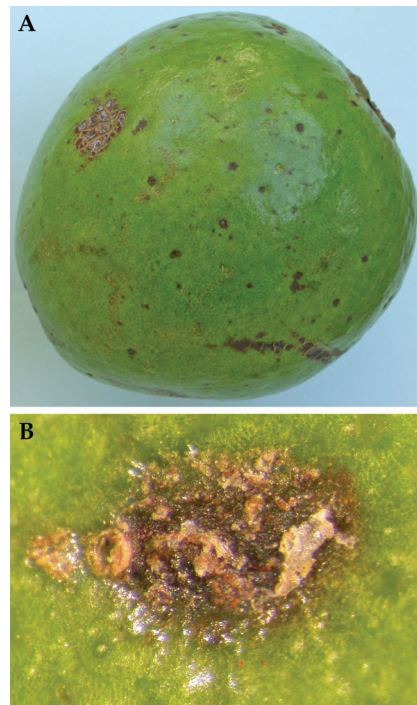


Figure 13. A) Leaffooted bug damage to guava. B) Close up of leaffooted bug damage to guava fruit.

Insects and Mites on Foliage

Thrips

Red-banded thrips are slender, yellowish and with a red band on the abdomen; about 1.5 mm long (Figure 14). Adults are dark brown to black (Figure 15). They can be found on the upper and undersides of the leaves. Red-banded thrips, *Selenothrips rubrocinctus* (Giard) are often troublesome on guava and may cause defoliation and fruit russetting. When infestations are heavy, thrips feed on the entire surface of the leaves, leaving the leaf with a characteristic silver color. Infested leaves are spotted on the upper surface with fecal deposits that turn reddish brown to black.



Figure 14. *Selenothrips rubrocinctus*, red-banded thrips pupae. Identification by H. Glenn, 3 Aug. 2006.

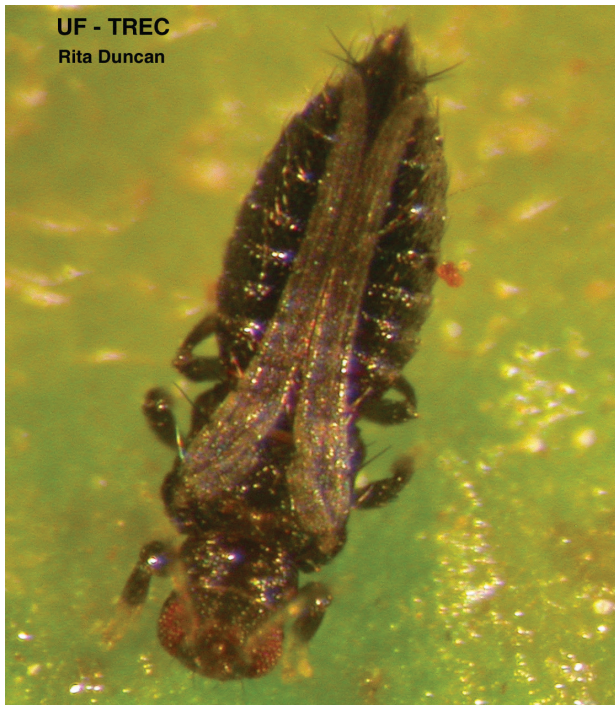


Figure 15. *Selenothrips rubrocinctus*, red-banded thrips adult. Identification by H. Glenn, 3 Aug. 2006.

Scales

Several scales infest guava trees throughout the year. *Philephedra tuberculosa* (Figure 16), *Ceroplastes* spp. (Figure 17 A and B), and the invasive species *Phalacroccus howertoni* (Figure 18). These scales are most commonly found on the leaves and stems of the tree; they will occasionally become abundant enough to be considered a pest and require control.



Figure 16. *Philephedra tuberculosa* scale on guava leaves and fruit.



Figure 17. A) A wax scale, *Ceroplastes* sp. immature on guava leaves. Identification by I. Stocks, 13 Jan. 2015. B) A wax scale, *Ceroplastes* sp. adult on guava leaves. Identification by I. Stocks, 13 Jan. 2015.

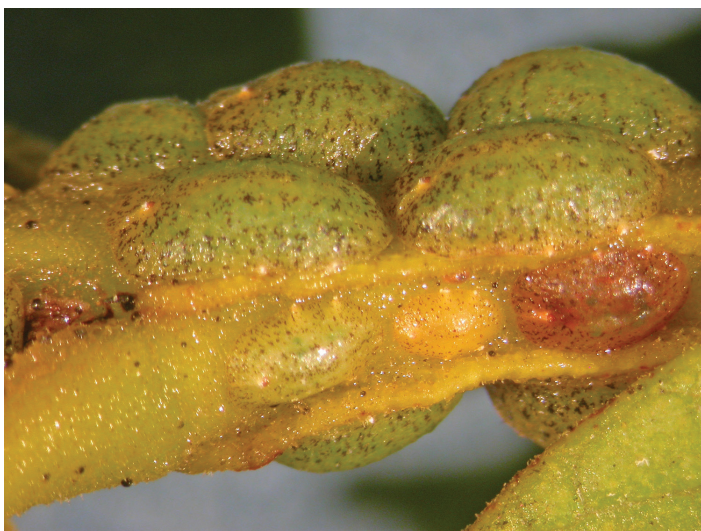


Figure 18. The croton scale, *Phalacroccus howertoni* on a leaf petiole. Identification by I. Stocks, 16 Nov. 2011.

Mites

The mites, *Tegolophus guavae*, cause damage to fruits and tender leaves. These mites are observed in early autumn, through winter, and during spring months. They are most often observed on small fruit, causing pimples or deformations, followed by fruit bronzing. Mite populations develop resistance to pesticides very rapidly because they have such a short generation time. Soap or oil sprays may be an alternative control measure.

Insects on Stem and Trunk

Scales

The invasive lobate lac scale, *Paratachardina pseudolobata* (Figure 19 A and B), was first found on hibiscus in Florida. It is a polyphagous species, and it has been found damaging stems of guava trees. The female is 1.5–2 mm long.

Control, Precautions, and Restrictions

Guavas are subject to attack by several insects; however, only a few have populations at levels high enough to be considered pests. Below is a website that contains control measures to use on an as-needed basis. However, the user must read the pesticide label carefully and adhere to regulations. Your local UF/IFAS Extension office may be able to provide more information on pest control materials.

<http://edis.ifas.ufl.edu/hs177>

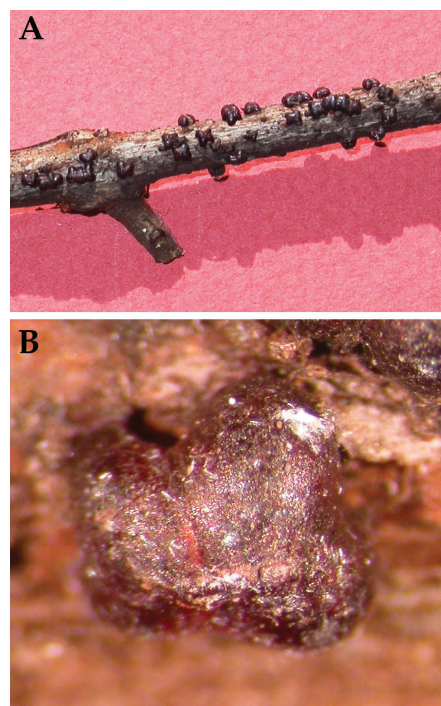


Figure 19. A) The lobate lac scale, *Paratachardina pseudolobata*, on a guava stem. B) A close up of the lobate lac scale, *Paratachardina pseudolobata*.

References

- Castineiras A, Peña JE, Duncan R, Osborne L. 1996. Potential of *Beauveria bassiana* and *Paecilomyces fumosoroseus* (Deuteromycotina: Hyphomycetes) as biological control agents of *Thrips palmi* (Thysanoptera: Thripidae). *Florida Entomologist* 79(3):458–461.
- Duarte IS, Nuñez LB, Peña JE, Pinto L. 2008. Biology, Parasitoids and Damage of *Leptoglossus zonatus* and *Leptoglossus gonagra* (Heteroptera: Coreidae) on Citrus. *Proc Fla State Hort. Soc.* 121.
- Jacas J, Gomez A, Peña JE, Duncan R. 2002 *Anastrepha suspensa* (Loew), Diptera: Tephritidae. Levante Agrícola.
- Peña JE. 2013. *Potential Invasive Pests of Agricultural Crops*. Wallingford, Oxfordshire: CABI. 440 p.
- Peña JE, Duncan R, Vasquez T, Hennessey M. 1999. Guava arthropod seasonality and control of fruit flies in South Florida. *Proc Fla State Hort. Soc.* 112:4.
- Simmonds TJ, Carrillo D, Burke GR. 2016. Characterization of a venom gland-associated rhabdovirus in the parasitoid wasp *Diachasmimorpha longicaudata*. *Journal of Insect Physiology* 91-92:48–55.

Table 1. Insecticides registered for guava in Florida.

Chemical Name	Brand Name(s)	Pest(s) Controlled
Azadirachtin	Align, Azatin	general insecticide
<i>Bacillus thuringiensis</i>	Dipel, others	lepidoptera larvae
<i>Beauveria bassiana</i>	Mycotrol	aphids, mealybugs, others
Bifenazate	Floramite ¹	mites
Bifenthrin	Talstar ¹	various insects, mites
Fenoxycarb	Logic ¹	ants
Fenpropathrin	Tame ²	various insects, mites
Hexythiazox	Savey ²	various insects, mites
Hydramethylnon	Amdro ¹	ants
Kaolin (clay)	Surround	barrier and irritant to various insects
Imidacloprid	Provado	thrips
Malathion	Malathion	Caribbean fruit fly, lepidoptera, scales, thrips
Potassium salts of fatty acids	Safer Soap	aphids, lace bugs, mealybugs, spidermites, others
Pymetrozine	Endeavor ²	aphids, whiteflies
Pyrethrin + rotenone	Pyrellin	aphids, lepidoptera, thrips
Pyriproxyfen	Esteem ant bait	ants
Pyriproxyfen	Knack, Esteem	scales
S-methoprene	Extinguish	ants
Spinosad	SpinTor 2SC	lepidoptera larvae, mirids, thrips
Various refined horticultural oils	Sunspray, citrus spray oil, crop oil, FC 435-66, FC 455-88, others	aphids, mites, scales
¹ For use with non-bearing trees only.		
² For nursery/non-bearing trees only.		