Miscellaneous Insect Pests of Florida Sugarcane

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The sugarcane insect pests discussed in this report are of occasional economic importance in Florida. Because they have not been as important as other sugarcane pests such as corn wireworm (*Melanotus communis*), or historically important as the sugarcane borer (*Diatrea saccharalis*), they have received less research interest and less is known about them. However, growers should be aware of these pests because they have the potential to become a problem if conditions favor their reproduction and growth.

**Sugarcane Spider Mites**

Spider mites, primarily *Oligonychus stickneyi*, have been occasional pests of importance in Florida sugarcane since the 1970s (Figure 1). These mites live and feed on the undersides of leaves. They form fine webs in which eggs are laid and young nymphs develop. Leaves infested by mites display an orange to reddish brown discoloration (red-russetting) similar to that associated with sugarcane lacebugs. Severe damage by spider mites can result in leaf death.

Spider mite infestations generally occur during March - June. The lower leaves of sugarcane are usually colonized first. Damage by spider mites may often be of little consequence. However, prolonged heavy infestations accompanied by extensive damage to the middle and upper leaves (Figure 2) of young plants may reduce growth. Predaceous mites, a predaceous thrips, and rainfall help control spider mites. Products with elemental sulfur are currently the only agrochemicals (pesticides and fertilizers) labeled for use in sugarcane that can control spider mites. Multiple applications would be required to try to bring the mite under control, particularly because the mites are found predominantly under the leaves, rather than on the top of the leaves where most of the applied sulfur would be deposited.

Sugarcane spider mite damage to the lower leaves results in stripes of green healthy leaves alternated with stripes of yellow to bronzed leaves between the planted rows as viewed from the field edge (Figure 3). Damage to upper canopy leaves results in a bronzed appearance across the entire infested portion of the field. Growers should look carefully...
for mites if they suspect an infestation; a substantial amount of mite damage does not necessarily mean mites are still present.

**Sugarcane Rust Mite**

The sugarcane rust mite, *Abacarus sacchari* (Actinedida: Eriophyidae), was discovered feeding on sugarcane in Canal Point, Florida in September 2007. This was the first time this mite had been officially observed feeding on sugarcane in the United States. However, upon further examination of historical records and samples by acarologist Cal Welbourn of the Florida Department of Agricultural and Consumer Services in Gainesville, this mite was first observed on sugarcane in Belle Glade, Florida in 1983, but incorrectly identified as *Abacarus officinari*. This group of mites is very difficult to identify to species and modern techniques available today (e.g., low temperature scanning electron microscopy) made it possible to correctly identify the most recent outbreak of this mite in Florida. Described from Asian specimens, *A. sacchari* has now been recorded in Africa, Australia, India, Costa Rica, Venezuela, Brazil and Florida. In 2014, sugarcane rust mite infested sugarcane throughout the Florida commercial sugarcane industry.

All stages of the mite are oval-elongate tapering toward the end of the abdomen and have two pairs of legs. Waxy growths from the body vary by environment and plant host of the Florida Department of Agricultural and Consumer Services in Gainesville, this mite was first observed on sugarcane in Belle Glade, Florida in 1983, but incorrectly identified as *Abacarus officinari*. This group of mites is very difficult to identify to species and modern techniques available today (e.g., low temperature scanning electron microscopy) made it possible to correctly identify the most recent outbreak of this mite in Florida. Described from Asian specimens, *A. sacchari* has now been recorded in Africa, Australia, India, Costa Rica, Venezuela, Brazil and Florida. In 2014, sugarcane rust mite infested sugarcane throughout the Florida commercial sugarcane industry.

Feeding symptoms are cultivar-specific and range from an orange to rusty reddish-brown to purple discoloration on the underside of leaves (Figure 5). Symptoms may be masked by the pathogen orange rust, *Puccinia kuehni* (Basidiomycota: Pucciniales). The orange symptom color is similar to that of orange rust, but the *A. sacchari* feeding symptoms are more uniformly distributed over the leaves and do not result in the raised pustules characteristic of rust infestation. Discoloration patterns can vary by sugarcane cultivar. Furthermore, mite feeding symptoms can also vary by cultivar, whereby damage might be restricted to the...
mid vein, leaf blade, or spread across the leaf surface. Late in the summer heavily infested plants also show damage symptoms on the upper side of leaves, including reddish asymmetric blotches on the normally white center of the leaves above the mid rib. Leaves damaged by mite feeding display reduced photosynthesis associated with reduced chlorophyll content, transpiration, and stomatal conductance, but elevated intercellular CO$_2$ concentrations. Studies are currently in progress to determine whether mite feeding can lead to biomass or sugar yield reductions.

Elemental sulfur is currently the only agrochemical registered for use against mites in sugarcane. Additional miticides are currently being tested for control of this mite in sugarcane.

**American Grasshopper**

The American grasshopper (Figure 6), a birdwing grasshopper named *Schistocerca americana*, occasionally causes serious damage to sugarcane. They eat the blades down to the midrib of the leaves in jagged, irregular patterns, removing valuable photosynthetic tissue from the plant (Figure 7). This grasshopper has been common in southern Florida since 2009 and has been more commonly found feeding on sugarcane grown on the sandier soils west and southwest of Lake Okeechobee. The eggs are deposited in groups in the soil. Nymphs emerge to feed on many different plants throughout the landscape. Current status as a pest of sugarcane has not been determined to date.

**Sugarcane Lacebug**

The sugarcane lacebug, *Leptodictya tabida*, was first discovered in the United States on sugarcane in Palm Beach County, Florida in 1990. The adult lacebug is about 1/8” (3.5 mm) long, flat and light-brown or straw colored (Figure 8). The forewings are semi-transparent and finely laced or netlike. Five long, erect spines are present on the head. Nymphs are flat and whitish in color with many long, branched, erect spines. Eggs are laid singly into leaf tissue usually on the underside of the leaves. The tip of the egg is left outside the leaf tissue but is covered with a protective cap secreted by the adult female. A generation of lacebugs, from egg to adult, may take 20 to 30 days, with 5 nymphal molts.

In 1991 surveys conducted soon after it was detected in southern Florida, some sugarcane plants were infested by more than 100 adult and nymphal lacebugs per leaf. More than 75 eggs were observed on some leaves. Lacebug feeding results in light green or yellow speckles on leaves. Many cultivars develop a red discoloration (russetting) on the leaves that expands beyond the area of feeding. Another characteristic diagnostic character of sugarcane lace bug are the small, black, oily fecal deposits (i.e., frass spots) they deposit on the leaves. (Figure 9).
Damage is frequently restricted to a few leaves on each plant, and plants around the perimeter of fields usually exhibit more damage symptoms than those away from the field edges. The red discoloration from sugarcane lacebug feeding damage is visible from the top of the leaves (Figure 10). Yield damage to sugarcane by this insect has not been documented in Florida. Varietal differences in lacebug resistance have been noted in Hawaii and Florida.

Egg parasitoids of sugarcane lace bug have been found in Costa Rica and Venezuela, but natural parasite populations have not been observed in Florida. Predators of these plant-sucking insects include earwigs and spiders.

**Sugarcane Delphacid**

The sugarcane delphacid, *Perkinsiella saccharicida*, is a sugarcane pest of Australian origin (Figure 11). It was first discovered in Florida in 1982. Surveys quickly revealed that the delphacid ranged throughout the Florida sugarcane production area. To date, little economic damage has been reported by the pest. However, if a rapid population expansion were to occur, there could be serious economic damage due to its feeding and reproductive activities.

Females deposit eggs into the leaf tissue. Two to twelve eggs are laid in a cluster on either side of the leaf, mainly along the midrib, leaf sheaths, and stalk internodes. The egg is 1.0 mm by 0.35 mm, elongate-cylindrical and slightly curved. The narrow end of the egg protrudes just above the surface of the leaf and is covered with a white waxy material secreted by the female.

A female can lay up to 300 eggs during her normal 30-day life span. The incubation period varies from 2–3 weeks. The newly hatched nymph is pale, wingless, and starts feeding shortly after hatching. The nymphal period has 5 instars and lasts approximately 32 days.
Damage is caused primarily by actions of the adults and nymphs feeding on the sap of the sugarcane plant. The feeding causes yellowing and/or reddening and desiccation of the leaves. Additional damage results from impaired photosynthesis caused by growth of a sooty mold on honeydew excreted by the insects. Finally, laceration of leaf tissue by the insect’s saber-like ovipositor can cause reddening and desiccation of the leaves.

There are several natural enemies of sugarcane delphacids, including predators, parasitoids and pathogens.

Historically, the sugarcane delphacid has been more important as a vector of Fiji disease than as a problem by itself.

### West Indian Cane Weevil

The adult of the plant-sucking West Indian sugarcane fulgorid (also called the West Indian canefly, even though it is not a dipteran fly), *Saccharosydne saccharivora*, has light to medium green colored head, body and legs. The wings are nearly transparent making it possible to see the abdomen, and a white, waxy plug produced by the females to cover egg masses (Figure 12). The head is narrower than the body, and narrows to an obvious point in front of the golden yellow to orange eyes. Eggs are inserted into the leaf tissue, frequently along the underside of leaves into or along the midrib of sugarcane and sorghum. The nymphs are yellow to light green in color and produce copious amounts of wax that collects at the end of their abdomens and resembles cotton string that can exceed twice their body lengths. The nymphs develop through 5 instars in 6.5 to 7 weeks at 80°F. This species was recorded in Florida in 1909.

West Indian sugarcane fulgorids are commonly found on several additional cultivated and weedy grass species in Florida. Numbers can occasionally grow to damaging levels resulting in yield losses as was encountered in Louisiana in 2013. Sugarcane can be affected through direct loss of sap and through growth of sooty mold fungus on honeydew produced by the nymphs and adults. Accumulation of this fungus blocks photosynthesis and transpiration (as with the white sugarcane aphid). A reddish discoloration appears in sugarcane leaves where their eggs are deposited.

Parasitoids of nymphal West Indian sugarcane fulgorids were observed in Florida at least as early as 1937. The black-colored larvae of the parasitic wasps feed externally on the nymphal forgorids. Insecticides were identified by researchers in Louisiana that controlled the insect and resulted in increased yields compared to untreated plants in outbreak years.

### Yellow Sugarcane Aphid

The yellow sugarcane aphid, *Sipha flava*, usually appear bright yellow on sugarcane leaves in Florida. Their cornicles are reduced to raised pores on the top surface near the end of the aphid’s abdomen. Several rows of dark-colored, short, stiff hairs are also visible across their abdomen (Figure 13). Yellow sugarcane aphid secretes only tiny amounts of honeydew, so sooty mold fungal growth is not a problem on plants infested by this aphid. Damage symptoms are dependent on the sugarcane cultivar ranging from yellow to red to purple areas on the leaf that may ultimately die to become necrotic lesions. Prolonged feeding on susceptible cultivars results in reduced growth and tillering, and subsequent yield loss of sugarcane. Outbreaks of this aphid are frequently limited to localized areas of the field that may go unnoticed when they are away from the field margins. However, field-wide outbreaks of the aphid can develop, particularly during the drier spring and
fall months in southern Florida. This aphid is frequently held under control by predacious insects (e.g., predacious ants, earwigs nymphs and adults, ladybird beetles larvae and adults, green and brown lacewing larvae). No known species of parasitic wasps exist that attack this aphid species. Pyrethroid insecticides labeled for use in sugarcane can reduce aphid numbers, but may also upset the natural control process resulting in larger outbreaks of the aphid, particularly in the drier late spring and late fall months of the year. Colonies of yellow sugarcane aphid are frequently greatly reduced by heavy rainfall associated with summer thunderstorms.

There are several mechanisms of sugarcane resistance to damage by the yellow sugarcane aphid. These mechanisms are variety dependent, and include tolerance and antibiotic effects on aphid development. Winged yellow sugarcane aphids usually restrict their primary colonization to susceptible cultivars. Florida susceptible cultivars include CP61-620, CP72-1210, CP72-2086, CP80-1827 and CP89-2143.

**White Sugarcane Aphid**

The white sugarcane aphid, *Melanaphis sacchari*, is dirty white or light grey to very light tan in color with very short cornicles (Figure 14). It feeds mostly on the undersurface of sugarcane leaves. Feeding by this aphid does not result in yellow to purple areas on the leaf as with yellow sugarcane aphid. However, white sugarcane aphid produces large amounts of honeydew that collects mostly on the upper leave surfaces and provides a substrate for sooty mold fungi. The fungal growth accumulates to block sunlight and reduces photosynthesis thereby negatively affecting yield. White sugarcane aphid also transmits viruses (e.g., Sugarcane yellow leaf virus) to sugarcane that reduce yield. Large white sugarcane aphid colonies on sugarcane in Florida are not common as the aphid is held under control by the same predators as for *S. flava*, as well as by a parasitic wasp (Braconidae: *Lysiphlebus testaceipes*) and fungal pathogens.

**West Indian Cane Weevil**

The West Indian cane weevil, *Metamasius hemipterous*, was first found infesting cane in Florida in 1994. Sometimes referred to as the “rotten cane stalk weevil,” adult weevils (Figure 15) are usually attracted to sugarcane stalks that already have some sort of injury (e.g., damage by other insects or rats). However, the weevil may be attracted to some cultivars such as CP85-1382 that have growth cracks, but no other obvious abnormalities.

Eggs of the West Indian cane weevil are laid into sugarcane stalks through cracks or into plant tissues damaged by rats, insects, wind, or mechanical implements. The white, legless larvae from these eggs feed within the stalk and grow to more than an inch in length. A pupal case made of shredded inner stalk fibers is usually constructed within the infested plant, although pupal cases may sometimes be found on the ground around infested stalks. The entire life cycle from egg to adult may be completed in around 8 to 10 weeks, depending on temperature. The tunnels and damage by the weevil can be so extensive that stalks may break. General observations indicate the weevil can cause large yield reductions in susceptible cultivars like CP85-1382. Damaged stalks may be unfit for use as seed.
A trapping method exists for the adult weevils that may be useful for identifying when infestations of the pest begin to develop. With respect to biological control, no parasites, predators or pathogens of the rotten cane stalk weevil have yet to be observed in Florida. Growing sugarcane varieties resistant to the weevil and limiting rat and insect damage are the key management tactics. Population levels of adult weevils in an area may be reduced using traps during the summer and fall, which might help limit infestations in sugarcane.

**Diaprepes Root Weevil**

The Diaprepes root weevil, *Diaprepes abbreviatus*, is invasive to Florida and is an important pest of sugarcane in Barbados and Puerto Rico. This insect is a root weevil native to the Caribbean, and the damage it causes to sugarcane plants marks this insect as one of the most economically important pests in that region. It was first reported in Florida during the 1960s. Since then it has spread over a large area of central and southern Florida where it is damaging to citrus, ornamental plants, and some other crops. Although this root weevil was typically observed in or near Florida sugarcane areas, actual damage to Florida sugarcane was not observed until 2010. Eggs are yellowish white and are deposited between leaves cemented together by the female (Figure 16). Larvae are white and look like grubs, but have no legs. Larvae feed on roots and tunnel into the stool and below-ground stalks (Figure 17). Damage is similar to grub damage whereby sugarcane plants suffer yellow discoloration, become highly stunted, and are prone to lodging. Adult coloration is quite varied ranging from all black with a few orange markings to nearly all orange with black markings (Figure 18). Damage has been significant locally with stalk lodging, exposed root balls and stand loss (Figure 19).

Recent studies show that several weed species found in Florida sugarcane are suitable as food sources and egg-laying sites for Diaprepes root weevil. These include the highly invasive Brazilian pepper tree, a highly invasive woody plant found throughout central and southern Florida, including around sugarcane fields. Weed control is very important in preventing Diaprepes root weevil infestations in sugarcane.

**Lesser Cornstalk Borer**

The larva of the lesser cornstalk borer, *Elasmopalpus lignosellus*, is a slender worm with creamy white, brown and bluish-green bands growing ¾ to 1 inch long when fully grown (Figure 20). Adults are short narrow moths about ½ to ¾ inch long with grey or brown patterns on the wings and a narrow row of fine spots along the rear margin of their front wings (Figure 21).

The larvae bore into young plants at or below the soil surface and usually cause a “dead-heart” similar to the sugarcane borer or wireworms (Figure 22). Feeding damage within the stalk above the growing point appears as rows of holes in emerging leaves. The larvae construct a tubular burrow in the soil extending outward from the cane plant. The burrow consists of soil particles which the borer webs together with silk. The larva pupates in this burrow and transforms into a small moth. The presence of these silk

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Figure 15. West Indian cane weevil adult.

Figure 16. West Indian cane weevil eggs between sugarcane leaves. Credits: Alvin Wilson, University of Florida
tubes and/or a small circular entrance hole at the base of the young stalk (often just below the soil surface) distinguishes deadhearts caused by lesser cornstalk borers from those caused by wireworms.

The life cycle of the lesser cornstalk borer ranges from 38 to 65 days. There is considerable overlapping of generations with no sharp seasonal breaks in populations, although infestations during late summer may be uncommon.

Most damage from this pest occurs to young plants during warm, dry periods. Ratoon cane usually recovers better from lesser cornstalk borer attack than young plant cane. Damage associated with stand loss from larval feeding on young emerged shoots and tillers is dependent on cultivars.

Although there are parasites of the lesser cornstalk borer, the protection given by the silk tube may render these parasites inefficient as biological control agents. Adult lesser cornstalk borers can be monitored using pheromone traps. Insecticides containing clorantraniliprole have proven effective at controlling larvae and reducing sugarcane damage.

**Grass Leaf Tier**

The larvae of this grass leaf tier, *Myasmia trapezalis*, feed within the youngest leaves emerging from the top of sugarcane stalks (as well as on sorghum, maize, and rice). The larvae tie the edges of the leaves together with silk to form a protected environment to feed and molt (Figure 23). It is not uncommon during the spring months to find the youngest leaf tied together with the terminal end of the leaf dead from feeding (Figure 24), but this damage is not known to affect long term growth of the plants or overall crop yield.
Selected References


