



## Weevil Problems in the Landscape with Emphasis on *Myloccerus undatus* (Sri Lanka Weevil)

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Weevils can be common problems in the landscape and in production of ornamental plants. Some of the most common weevils include palm weevil, various root weevils, silky cane weevil, leaf-rolling weevil, Mexican bromeliad weevil, *Eurhinus magnificus*, and the Sri Lanka weevil. Damage is commonly caused by feeding from adults that is often exhibited as leaf notching. The larvae are also sometimes considered pests as root feeders. The level of damage is dependent on the type of weevil and host plant. Two of the most devastating weevils in the landscape are the palm weevil and the Sri Lanka weevil. Palm weevil (*Rhynchophorus cruentatus*) is the largest weevil in North America and is native to Florida. The most common palms this weevil attacks include the cabbage palmetto, canary island date palm, washingtonia species, royal palms, and others. Symptoms vary but generally include decline of younger leaves and destruction of the crown. A similar weevil, the red palm weevil (*Rhynchophorus ferrugineus*), which is considered a global dilemma, had never been reported in North America, until late 2010 when it was detected in southern California. The Sri Lanka weevil (*Myloccerus undatus*) was first found in Florida in 2000 but has been a growing landscape problem. The adults are small, white, and black and feed on the foliage of numerous ornamental and fruit plants. High populations of the adults can cause severe damage to leaves. The larvae are root feeders but the level of damage is unknown.

Weevils are small beetles that possess conspicuous snouts, often with a pear-shaped body. They compose a large, diverse, and important group of insects. Most feed on plant material and many are considered to be economic pests. When immature, the legless, grub-like larvae feed on plants. They belong to the Curculionidae family (snout weevil), which includes 60,000 beetles. The general characteristic is the elongation of the stomal region into a snout, which has tiny mandibles at the end used for preparing oviposition and feeding. In addition, the legless larvae (or grubs), are entophytic, feeding inside the plant host where they are protected from predators, the environment, and insecticides.

Weevil damage to plants ranges from insignificant to severe. Pathogenic weevils include diaprepes root weevil (*Diaprepes abbreviatus*), twobanded Japanese weevil (*Pseudoneorhinus bifasciatus*), leaf-rolling weevil (*Homoeolabus analis*), thief weevil (*Pterocolus ovatus*), cypress weevil (*Eucociminius mannerheimii*), Florida bromeliad weevil (*Metamasius mosieri*), Mexican bromeliad weevil (*Matamasius callizona*), silky cane weevil (*Metamasius hemipterus*), ligustrum weevil (*Ochyromera ligustri*), palmetto weevil (*Rhynchophorus cruentatus*), red palm weevil (*Rhynchophorus ferrugineus*) (not in Florida), fuller rose weevil (*Asynonychuss godmanni*), whitefringed beetles (*Naupactus leucoloma*), hunting billbug (*Sphenophorus venustus*), agavae snout weevil (*Scyphophorus acupunctatus*), little leaf notcher (*Artipus floridanus*), Sri Lanka weevil (*Myloccerus undatus*), and *Eurhinus magnificus*. The three most significant important in Florida are palmetto weevil (*Rhynchophorus cruentatus*), silky cane weevil (*Metamasius hemipterus*), and Sri Lanka weevil (*Myloccerus undatus*).

The palmetto weevil (*Rhynchophorus cruentatus*), native to Florida, is the largest weevil in North America and the only species of palm weevil in the continental United States. It is not a primary invader, rather an opportunistic insect that is attracted to infested, stressed, dying, or aged palms. The Palmetto weevil has a complete life cycle: eggs, several larval instars, pupal, and adult. It takes up to 84 d to complete the cycle, and there can be multiple annual generations. The eggs are laid in the petiolar base or wounds of the host plant. Under lab conditions the female can lay an average of 207 eggs in her lifetime. Eggs hatch in 3 d and larvae begin to feed on palm tissue. The larvae (or grubs) are legless and creamy to yellowish in color. Their prominent head is dark brown, very hard, with large mandibles that are used to consume plant tissues. Mature larvae can be quite large, some close to 6 g. In some countries they are considered a delicacy. The final instar migrates to the stem periphery or petiole base where the pupae and adults emerge. On average 23–32 adults will be produced from a lethal infestation. The adult varies in color from solid black to red with variable black patterns and their size from the tip of the rostrum to end of the pygidium ranges from 1.9 to 3.0 cm. They feed within the palm and are capable of destroying the palm from within. It is possible to find cocoons within and without the palm. Palmetto weevil adults are active fliers and can be found throughout the year in Florida; however, the activity is more noticeable during late spring and early summer. Early detection of weevil infestation is very difficult, and treatment even in the early stages of infestation may be too late. One symptom of weevil infestation is the decline of the younger leaves, with the end of the palm top falling over under its own weight. Removal of infested palms is recommended. Significant losses in transplanted mature Cabbage and Canary Island palm have been documented.

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Management often includes protecting exotic palms during their window of vulnerability with a prophylactic leaf axial insecticide treatment, or with physical barrier or baited traps, which are recommended.

The silky cane weevil (*Metamasius hemipterus sericeus*) is distributed through the West Indies, and Central and South America, and was first reported in Miami County, Florida, in 1984. In Florida, *M. h. sericeus* is an economically important pest of sugarcane. Palms like Canary Island date, Royal, Majesty, and Spindle palms are favored, but many other species are at risk. Larvae of *M. h. sericeus* are borers that tunnel through plant stems and petioles, causing extensive damage resulting in the production of gummy, amber-colored exudates. Overall the symptoms include lethal wilt, general chlorosis, and premature leaf death. Eventually the crown is completely destroyed.

Adults of *M. h. sericeus* vary in color from red to orange and black. The size of adults, from the tip of the rostrum to the end of the pygidium, varies from 9 to 14 mm. Larvae are legless grubs, are creamy to yellowish in color, and their prominent head is reddish-brown and very hard.

*Metamasius hemipterus sericeus* has a complete life cycle, with an egg, several larval instars, pupal, and adult stages. Adults can live for 60 d and females deposit an average of 500 eggs. Females are attracted to and oviposit in damaged or stressed sugarcane stalks, banana pseudostems, ripe fruit (pineapple, mango, papaya), or palm sheaths or stems. Eggs hatch in about 4 d and begin to feed. In sugarcane, larvae feed in the pith, sometimes boring into healthy tissue. Larval tunneling in palm starts in wounded petioles, crowns, or stems and then extends into healthy leaf or stem tissue. After about 7 weeks, larvae construct a fibrous cocoon. After about 10 d, pupae transform to adults and may immediately break free of the cocoon, or remain within until conditions are favorable for emergence.

*Metamasius hemipterus sericeus* is generally considered to be a secondary pest of damaged sugarcane. However, larvae feeding on dead tissue often bore into and feed on healthy material resulting in significant damage or even cane death. Typically, *M. h. sericeus* infestations in palms are not lethal. However, aesthetic problems are observed such as exudates running down the palm stem or crown shaft. In addition, palm stress created by *M. h. sericeus* infestation can increase the chances of infestation by the palmetto weevil, *Rhynchophorus cruentatus*. Because *M. h. sericeus* is a borer, it can be easily transported within infested plants and is considered to be a regulatory problem. Trapping of adults is the method most often used to monitor weevil populations. The populations build up during the spring, summer, and early fall in Florida. Chemically-based management tactics are currently recommended for control of *M. h. sericeus*. The adults of *M. h. sericeus* are killed by labeled rates of acephate, carbofuran, chlorpyrifos, cyfluthrin, disulfoton, imidachloprid, isofenphos, lindane, and vydate. The use of biological control agents (entomopathogens) provides a promising means of managing *M.*

*h. sericeus*. The entomogenous fungi *Beauveria bassiana* and *Metarhizium anisopliae* have gained considerable attention as potential control agents for weevils. The nematode *Steinernema carpocapsae* is efficacious against larvae but not the adults of *M. h. sericeus*. Chemical insecticides and biological control agents would need to be applied frequently and over a long period of time for effective management of established populations.

The Sri Lanka Weevil (*Myloccerus undatus*) is native to Sri Lanka and was first detected in Florida (Broward County) in 2000. It has a large host range that includes almost 103 plants like lychee, mango, citrus, cotton, veitchia and areca palm, black-olive, mahogany, pigeon plum, seagrape, wild tamarind, and others. The life cycle under lab conditions is less than 2 months. Adults lay approximately 360 eggs over a 3-d period in the soil. The larvae are small creamy/white, and legless. The larvae are root feeders, pupate in the soil and leaf litter, and are difficult to detect. The adults are about ¼ inch (6 mm), whitish/gray, and commonly found on the foliage of their host plant. They have a characteristic pronounced spur on their legs (femur) and a slightly yellow head. Damage on infested plants can range from notching on leaf margins in a irregular pattern to a much more extensive feeding along the leaf vein. Many times this damage is cosmetic and the plant recovers but damage has been found on plants shipped to other states. Insect damage is most noticeable during spring when plants are producing new foliage. When new leaves are flushing out, inspections should start for this insect and its characteristic leaf notching. If necessary, severe infestations can be controlled by using insecticide that includes carbaryl, acephate, and pyrethroids, systemic insecticide, and biorational products. Mechanical control is possible by holding an open inverted umbrella under a branch and shaking it vigorously to knock the weevils into the umbrella; they can be dumped into a bucket of soapy water. For good management it is very important to recognize the insect stages and locations, proper timing for insecticide applications, and evidence of the presence of natural enemies.

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