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### Tuttle Mealybug (*Brevinnia rehi*)



Photo: Lyle Buss, UF

Tuttle mealybug, *Brevinnia rehi*, is a piercing-sucking insect pest found worldwide. It is also known as the rice mealybug because it is a damaging pest of rice and sugarcane in Asia where those are its primary hosts. This pest was first documented in Florida in 1975 in Pompano Beach, but was rarely found or associated with turfgrass damage until the early 2000s. In recent years, perhaps coupled with the increasing popularity of zoysiagrass lawns, these insect pests have become more commonly reported damaging turfgrass.

#### **Identification**

As with mealybug pests commonly found on ornamental plants, tuttle mealybug is small (<2 mm) and difficult to find in low numbers. In addition, it feeds in concealed locations, commonly beneath the leaf sheath or between grass blades and the stem. These insects have pink, oval-shaped bodies and secrete a white, waxy substance, which covers their body and parts of leaves. Adult females are larger and often covered with more wax than nymphs. Other mealybug species, Winnemuca grass mealybug and pink sugarcane mealybug, have been found on turfgrass and resemble tuttle mealybug in appearance. Therefore, mealybugs must be collected and sent to DPI for identification. Despite this, management is likely the same.

When surveying for these insects, one must closely inspect the plant material in and adjacent to several areas exhibiting damage. A 10-40X hand lens or field microscope will be helpful in identifying these small insects. Insects will be found concealed in the leaf sheath and near the base of the plants, so close examination is critical. Look for the white, waxy substance as well as the presence of black sooty mold.

#### **Biology**

Tuttle mealybug goes through incomplete metamorphosis, which means the adult and immature stages are damaging and resemble each other. Despite this similarity, nymphs will be more easily controlled since they are smaller and likely covered in less wax. These are piercing-sucking pests, which means they insert their hair-like mouthparts into plant material and feed on plant nutrients.

#### **Florida Distribution**

These insects have primarily been found in southern Florida (Miami-Dade, Lee, Collier, and Palm Beach Counties), with a report as far north as Orange County in 2012. Recent reports suggest that these pests and/or other turfgrass-infesting mealybugs are more widely distributed and damaging in Florida, although further investigation is needed.

### ***Host Plants***

Tuttlet mealybug is most often found feeding on and damaging zoysiagrass, although it is also a pest of bermudagrass. It has also been found on signal grass, crowfoot grass, goose grass, and several ornamental grasses.

### ***Damage***

Landscape managers are generally more familiar with managing mealybugs on ornamental plants than turfgrass. However, damage caused by mealybugs in turfgrass is similar. Mealybugs feed on plant sap, which contains high amounts of sugars that the grass needs for photosynthesis. The insects do not metabolize much of these sugars they ingest. As a result, plant material turns yellow, brown, and dies back while the insects excrete large amounts of waste, called honeydew. This honeydew makes the turf sticky and also causes black sooty mold fungus to grow, which can further exacerbate plant damage. Heavily infested areas of turfgrass appear generally unhealthy, resembling drought stress or disease. One identifying characteristic is the presence of honeydew and sooty mold on the lower portion of the turf and on the surface of the thatch layer.



Photo: Tuttle mealybug infestation illustrating white waxy appearance and dark sooty-mold growth in the background

Photo: Lyle Buss, UF

### ***Management***

Very little research has been conducted to determine the best strategies for managing tuttle mealybug in turfgrass. In general, mealybug control is challenging because the insects are difficult to reach with insecticides, their waxy excretions may protect them from control efforts, and they are difficult to detect before they reach damaging populations. When populations reach high levels, they can be extremely difficult to reduce and often take several weeks or months to get back below damaging levels.

Maintaining a dense, healthy stand of turfgrass while minimizing inputs and disturbances is the best defense against mealybug outbreaks. Follow recommended irrigation, fertilization, and mowing practices. Over-fertilization and/or drought stress may cause mealybug populations to increase.

There are two known parasitoid wasps that attack tuttle mealybug, although, they have not been documented in Florida. Little is known about what else attacks them, but generalist predators like beetles, spiders, and predatory bugs are likely providing some level of control.

Several insect pests can be effectively managed by physically removing them from the landscape. Although turtlet mealybug is primarily found near the base of the plant, collecting and discarding of grass clippings when mowing may help reduce the population.

Mealybugs are most effectively controlled with systemic insecticides and achieving thorough coverage. This is because they are difficult to reach with contact-toxic products and they feed on plant sap, where systemic products are present. In residential lawns, there are few insecticide options available. Neonicotinoid products (e.g. thiamethoxam, dinotefuran, clothianidin, imidacloprid) are likely to be most effective because they are systemic and have longer residual activity. A newer systemic compound, cyantraniliprole, may be an effective option, although it has not been tested against turtlet mealybug. Pyrethroids (e.g. bifenthrin, deltamethrin) and carbamates (e.g. carbaryl) are not systemic and may initially reduce the population, but will not provide lasting control and will require multiple applications. There are multiple combination products that contain pyrethroids and neonicotinoids (e.g. bifenthrin + imidacloprid), which may provide initial contact toxicity as well as longer systemic control. Targeting these insects with a rotation of the listed products will reduce the chance of resistance and may provide greater control. Always follow label directions and restrictions when applying these products and rotate modes of action to reduce the risk of insecticide resistance.

### ***Secondary pest outbreaks***

Cover spray applications of broad-spectrum insecticides causes secondary pest outbreaks. Secondary pests are those that exist in the landscape below damaging levels, but outbreak following the application of broad-spectrum, non-selective, insecticides targeting another pest. Broad-spectrum insecticides are toxic to all arthropods in a treated area, both pests and beneficials. Examples of commonly used broad-spectrum insecticides include pyrethroids, carbamates, and organophosphates.

Scale insects and mealybugs are classic examples of secondary pests that may outbreak following such disturbances in a landscape's ecosystem. For this reason, we often see greater frequencies of scale insect and mealybug outbreaks in landscapes that have been under intensive insecticide applications. Therefore, be mindful of the spectrum of products being used and the area they are being applied. Rotate chemistries between selective and non-selective products, and spot-treat infestations to reduce toxicity to biological control organisms inhabiting the landscape.



Photo: Lyle Buss, UF

*\*For more information, contact your local county extension office. If you suspect a turtlet mealybug infestation, photos and insect specimens are the best way to obtain an accurate diagnosis. Management recommendations described in this document are based on research and results observed with other mealybug pests of turfgrass and ornamental plants. Currently, little information is available specific to the management of turtlet mealybug.*