

Managing Scale Insects and Mealybugs on Turfgrass¹

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Introduction

Scale insects and mealybugs can be found to some degree in most managed landscapes. Although they are most commonly associated with ornamental plants, this group of insects can also be damaging pests of warm season turfgrasses, like zoysiagrass, bermudagrass, St. Augustinegrass, and centipedegrass. To date, relatively little research has investigated management strategies for these pests in turfgrasses, and few products are specifically labeled or tested for their control. This document is intended to provide turfgrass professionals and the public with an overview of the identification, biology, ecology, and management of the most common scale insect and mealybug pests found in warm-season turfgrasses in Florida and the southern United States.

At least five species of leaf-feeding scale insects and mealybugs are pests of turfgrasses in the southeastern United States and Florida: pasture mealybug (*Helicoccus summervillei* Brookes: Pseudococcidae), rhodesgrass mealybug (*Antonina graminis* (Maskell): Pseudococcidae), tuttle mealybug (*Brevinnia rehi* (Lindinger): Pseudococcidae), bermudagrass scale (*Odonaspis ruthae* (Kotinsky): Diaspididae), and *Duplachionaspis divergens* (Green) (Diaspididae). A sixth group of turfgrass scale insect pests, ground pearls (*Eumargarodes laingi* (Morrison): Margarodidae), live in the soil and feed on turfgrass roots. Most of these insects are occasional pests, although some have become prevalent, and all can be difficult to control and may cause extensive damage if left unmanaged.

Scale Insect and Mealybug Biology

Scale insects and mealybugs are piercing-sucking insects (Hemiptera, superfamily Coccoidea) that feed on plant sap from the vascular tissue or plant cells within plant leaves, stems, and roots. These insects go through incomplete metamorphosis, which means immatures and adults feed on the same plant material, physically resemble each other, and cause similar damage. Mealybugs (Pseudococcidae) excrete honeydew as waste,

whereas armored scale insects (Diaspididae) do not. Therefore, mealybugs are often associated with black sooty mold and ant activity, while armored scales are not. Scale insects and mealybugs are difficult to find and control because they are small, typically infest well-hidden locations or hard-to-reach areas of plants, and live a sedentary lifestyle. In addition, most species secrete a waxy material that covers their body at some point during their life and protects them from environmental conditions and control measures.

Scale Insect and Mealybug Damage

Landscape managers are generally more familiar with mealybug and scale insect damage to ornamental plants than turfgrass. However, damage caused by these pests in turfgrass is similar. Mealybugs ingest large amounts of plant sap, but do not metabolize much of its content. Thus, plant material turns yellow, red, or brown and dies back while the insects excrete large amounts of sugary waste, called honeydew. This honeydew makes the turf sticky and provides a resource for 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, and damage can be difficult to recover from.

Pasture Mealybug

The pasture mealybug (*Helicoccus summervillei* Brookes) is an invasive mealybug species that specializes on grasses and can become a pest of turfgrasses. The most current information on this insect can be found on the UF/IFAS Department of Entomology and Nematology's [Pasture Mealybugs website](#).

Identification

Adult female pasture mealybugs are the most easily and commonly detected life stage (Figure 1). They are 2-5 mm long, oval-shaped, and covered in white, fluffy wax protruding from their body. Immatures (nymphs) are much smaller (~0.5 mm long), creamy white, and have less waxy material covering their bodies. These insects are most commonly found infesting the undersides of

grass leaves (Figure 2), although they can also be found at the base of plants, in the soil, and under the thatch layer.



Figure 1. Adult female pasture mealybug on surface of limpograss leaf.
Credit: Lyle Buss, UF/IFAS



Figure 2. Infestations of pasture mealybug nymphs and adults on underside of limpograss leaf.

Credit: Erin C. Powell, FDACS-DPI

Biology

It takes approximately 37 to 47 days for a pasture mealybug nymph to develop to a reproductive adult. A single female can produce over 250 offspring during her lifetime, facilitating rapid population growth.

Distribution

This insect was first reported in the continental U.S. in Texas in October 2025. It was detected in Florida in May 2026 and has since been found in over 20 counties.

Host Plants

The pasture mealybug is a specialist on grasses. It has been found infesting bermudagrass, bahiagrass, St. Augustinegrass, and several grasses used in forage/pasture systems, as well as sugarcane.

Damage

Symptoms of infestation include initial yellowing of plant tissues, which progresses to reddish/purple and eventually turns brown and dies (Figure 3). Heavily infested plantings look drought-stressed, but do not recover from irrigation or precipitation. Infested grasses have reduced growth, poor root development, and are

more susceptible to disease caused by *Fusarium* fungus (Hauxwell et al. 2022).



Figure 3. Reddening of grass leaf tissue alongside dense infestation of pasture mealybug on limpograss.

Credit: Erin C. Powell, FDACS-DPI

Management

Conditions associated with high-density infestations include high temperatures, dense thatch accumulation, and frequent rainfall following periods of extended drought. Proper turfgrass maintenance will likely reduce susceptibility to damaging pasture mealybug infestations. Most pasture mealybug infestations have been found in association with grasses maintained at a tall height of cut or not mown at all.

The role of biological control organisms like predators, parasitoids, and insect-parasitic fungi is currently unknown in Florida. Several organisms have been observed in association with infestations, so using integrated pest management (IPM) tactics that help promote biological control are encouraged.

Rhodesgrass Mealybug, *Antonina graminis*

Identification

Rhodesgrass mealybugs have a distinct appearance that sets them apart from most other turf-infesting insect pests. They have round, dark brown bodies that are typically covered with a white, waxy secretion. This waxy covering resembles a tuft of cotton on the grass stem (Figure 4). This mealybug feeds under the leaf sheath, on leaf nodes, or within the crown of the plant. Mature females are most noticeable because they produce a spindly waxy fiber that extends from their round cottony body (Figure 5).



Figure 4. Rhodesgrass mealybug adult females.

Credit: Lyle Buss, UF/IFAS



Figure 5. Rhodesgrass mealybug adult female with white waxy filaments in bermudagrass.

Credit: Lyle Buss, UF/IFAS

Biology

Females reproduce parthenogenetically (without mating) and deposit 300–600 eggs in a cottony ovisac. There are no males. The nymphs (called crawlers) disperse and

begin feeding under a leaf sheath at a node. A white, spherical, waxy sac is secreted around them. After finding a feeding site, the insects will settle in and not move again. The life cycle of Rhodesgrass mealybug ranges from 60–70 days. In northern Florida, there are five generations per year, while generations are continuous and overlapping in southern Florida.

There are at least 14 natural enemies of rhodesgrass mealybug, including predatory beetles and parasitoid flies and wasps from nine genera within five families. Some ants, including the red imported fire ant (RIFA), may be found associated with these insects. The ants feed on honeydew excretions and protect the mealybugs from natural enemies.

Distribution

Rhodesgrass mealybug is distributed worldwide in tropical and subtropical climates. In the United States, it is primarily found the Gulf Coast region. This insect is widely distributed throughout Florida.

Host Plants

The Rhodesgrass mealybug has a wide range of host plants including 63 genera in four families. Most hosts are grasses (Poaceae) and it prefers rhodesgrass (*Chloris gayana* Kunth), johnsongrass (*Sorghum halepense*), bermudagrass (*Cynodon dactylon*), and St. Augustinegrass (*Stenotaphrum secundatum*) in Florida.

Damage

As with other mealybugs and soft scale insects, the Rhodesgrass mealybug feeds on plant sap and secretes honeydew as waste, which makes plant surfaces sticky and facilitates the growth of black sooty mold. Infested grass gradually yellows and shows symptoms resembling drought stress. Damage is most severe during extended hot, dry periods.

Tuttle Mealybug, *Brevinnia rehi*

The Tuttle mealybug is globally distributed. 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 found damaging turfgrass.

Identification

Tuttle mealybug is small (<1/10 inch or <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 that covers their body and parts of leaves (Figure 6). Adult females are larger and often covered with more wax than nymphs. The white wax is often the best indicator of infestation. Although not common, the Winnemucca 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 Florida Department of Agriculture and Consumer Services—Division of Plant Industry (FDACS-DPI) for proper identification. However, management is likely the same.



Figure 6. Tuttle mealybug and white waxy secretions at the base of zoysiagrass leaf.

Credit: Lyle Buss, UF/IFAS

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. 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

Little is known about the biology of this insect. Like other mealybugs, Tuttle mealybug goes through incomplete metamorphosis and feeds on plant sap with piercing-sucking mouthparts. Nymphs (Figure 7) and adults are often found cohabiting the same space on plant material. There are two parasitoid wasps (Encyrtidae) that attack Tuttle mealybug but 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.



Figure 7. Tuttle mealybug nymphs distributed across zoysiagrass leaf.

Credit: Lyle Buss, UF/IFAS

Distribution

These insects were first documented in the United States in Arizona in 1950. In Florida, Tuttle mealybug has been found primarily in southern counties (Miami-Dade, Lee, Collier, and Palm Beach Counties), with a report as far north as Orange County in 2012. Recent collections from northeastern (Duval County) and northwestern (Walton County) Florida in 2016 confirm that these pests are more widely distributed and damaging in Florida.

Host Plants

Tuttle mealybug primarily feeds on plants in the grass family (Poaceae). It is most often found feeding on and damaging zoysiagrass lawns, although it is also a pest of bermudagrass. It has been found on signal grass, crowfoot grass, goose grass, and several ornamental grasses.

Damage

Heavily infested areas of turfgrass appear generally unhealthy, resembling drought stress or disease (Figure 8). Damage can be widespread in lawns and become severe rather quickly due to the insect's nondescript nature and the insect's obscure behavior.



Figure 8. Extensive Tuttle mealybug damage in a zoysiagrass lawn in south Florida.

Credit: Adam Dale, UF/IFAS

For more information on Tuttle mealybug, see [EENY551: Tuttle Mealybug *Brevinnia rehi* \(Lindinger\) \(Insecta: Hemiptera: Pseudococcidae\)](#).

Bermudagrass Scale, *Odonaspis ruthae*

Bermudagrass scale is an armored scale insect that is found primarily on bermudagrass. This scale insect is more commonly found in taller growing areas and has been associated with heavy shade. Bermudagrass scale is more commonly found in golf course roughs, around sand traps, or along fencerows.

Identification

Individuals will be found tight against grass stems, often concealed within the leaf sheath, and are more commonly located near the base of the plant. The Bermudagrass scale adult female is oval, white, and approximately 1/20 inch (1–1.75 mm) in diameter, resembling a fried egg (Figure 9). Nymphs, called crawlers, are cream or brown in color and the only mobile life stage that can establish populations. Nymphs have been observed crawling across the surface of bermudagrass in areas showing damage.



Figure 9. Bermudagrass scale insects along a stem of bermudagrass.

Credit: Lyle Buss, UF/IFAS

Biology

The life cycle of a Bermudagrass scale ranges from 60–70 days, with five generations per year in northern Florida and continuous generations in southern Florida. There are two natural enemies of this insect, a parasitic wasp (*Adelencyrtus odonaspidis* Fullaway; Encyrtidae) and a predatory thrips (*Podothrips semiflavus* Hood; Phlaeothripidae). The parasitoid wasp is documented in Florida and Hawaii.

Distribution

This insect is distributed worldwide and throughout Florida. It was first reported as a damaging pest of forage and turfgrasses in the southern United States in 1964.

Host Plants

Bermudagrass scale is reported to feed on multiple hosts from 29 genera in six families. By far the most common hosts are grasses (Poaceae). It is reported as a major pest of bermudagrass grown in high-maintenance landscapes such as golf courses.

Damage

As with other armored scale species, this pest extracts sap by piercing individual plant cells. Feeding from dense populations results in gradual plant yellowing (chlorosis) and browning (tissue necrosis), and may lead to leaf, leaf-blade, or entire plant death. Stands of turfgrass decline slowly and resemble drought-stressed turf. Because this is an armored scale insect, bermudagrass scale will not produce sticky honeydew or be associated with sooty mold.

Duplachionaspis divergens

A more recently introduced armored scale insect pest, *Duplachionaspis divergens*, has become established in Florida. The potential economic impact of this pest is unknown, but it has been detected on several species of grasses. Infested grass clippings should be collected and destroyed to prevent further spread.

Identification

Duplachionaspis divergens is similar in appearance to the common ornamental plant pest false oleander scale (*Pseudaulacaspis cockerelli* Cooley). Female *D. divergens* are oyster shell-shaped, white in color, and approximately 1/10 inch (3 mm) long. Males are much smaller (1/25 inch long or 1 mm) and uniform along the length of their body. Individuals are typically found along the leaves of grasses (Figure 10).

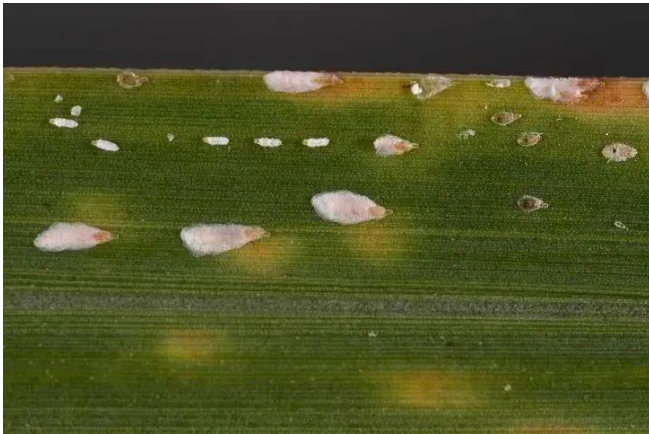


Figure 10. *Duplachionaspis divergens* males and females on ornamental grass.

Credit: Lyle Buss, UF/IFAS

Biology

This pest is reported to have nine generations per year in warmer climates, taking approximately 39 days to complete a generation. An average adult female produces 130 eggs in her lifetime. These insects are attacked by parasitoid wasps from five genera in the families Aphelinidae and Encyrtidae.

Distribution

This scale insect is documented throughout much of the eastern hemisphere. It was first documented in the United States in 2000 in Manatee County, Florida. This insect is now distributed throughout much of south Florida and parts of north Florida. Since its first documentation in Florida, *D. divergens* has been found in

the Caribbean region and other Gulf Coast states, including Alabama and Texas.

Host Plants

Duplachionaspis divergens has been detected on multiple host plants from 14 genera of grasses (Poaceae). These include *Miscanthus* spp., St. Augustinegrass, bahiagrass (*Paspalum notatum*), zoysiagrass (*Zoysia* spp.) (Figure 11), and other *Paspalum* spp.



Figure 11. Heavy infestation of *D. divergens* on zoysiagrass.

Credit: Adam Dale, UF/IFAS

Damage

Although this pest is occasionally found in high numbers, *D. divergens* is considered an infrequent pest of turfgrasses. In high-density infestations, grass blades turn yellow and brown, resembling drought stress (Figure 12).



Figure 12. Damage associated with a high-density infestation of *D. divergens* in a zoysiagrass lawn.

Credit: Adam Dale, UF/IFAS

Ground Pearls, *Eumargarodes laingi*

Identification

Ground pearls are found in the soil up to 10 inches (25 cm) below the surface. Eggs are pink to white and covered in a white waxy case. Nymphs form yellow to brown spherical shells or cysts, which is the basis of the name "pearl." These cysts (Figure 13) range in size from about 1/50–1/20 inch (0.5–1.5 mm). The adult female is wingless, 1/20 inch (1.5 mm) long, pink in color, and has well-developed forelegs and claws (Figure 14). Adult males are not commonly seen, but have wings and are gnat-like.



Figure 13. Cysts of *Eumargarodes laingi* collected from a centipedegrass lawn.

Credit: Lyle Buss, UF/IFAS



Figure 14. Adult female *Eumargarodes laingi*.

Credit: Lyle Buss, UF/IFAS

Biology

Clusters of pinkish-white eggs, covered in a white waxy sac, are deposited in the soil from March to June. The first-stage nymphs (called crawlers) emerge from eggs approximately 9–15 days later, attach to the roots, and enclose themselves in a hard, yellow-brown, globular

shell. Ground pearls overwinter in the cyst stage and females reach maturity in late spring. Females can reproduce without mating. One generation may last from one to two years. There are no known natural enemies of ground pearls in turfgrass.

Distribution

Ground pearl pests of grasses are distributed throughout the southern United States, parts of the tropical Americas, and regions of South America. In the United States, *D. meridionalis* has been found in Florida, Georgia, Alabama, South Carolina, North Carolina, Arizona, and California. In Florida, they are most common and damaging in the panhandle where there is a higher concentration of centipedegrass used for lawns.

Host Plants

Ground pearls feed on the roots of bermudagrass, St. Augustinegrass, and zoysiagrass, but prefer centipedegrass (*Eremochloa ophiuroides* Munro), hence the species common name.

Damage

Ground pearl feeding causes irregular patches of yellow, brown, or dying grass. Damage is most commonly noticed during spring green-up, especially during hot, dry weather. Grass rarely recovers and weeds often invade the damaged areas.

Management

There are currently no management strategies, including insecticides, available for ground pearls. Use best management practices (BMP) to minimize plant stress, and maintain proper fertility and soil moisture to help grass tolerate the damage.

For more information on ground pearls, see <https://edis.ifas.ufl.edu/in554>.

Scale Insect and Mealybug Management

Preventing spread

A key component of scale insect and mealybug management is reducing the accidental movement of insects on plants, people, and maintenance equipment. These tiny insects are very good at hitching rides on other things to disperse them in the environment. Therefore, they may move from one turfgrass stand to another by 1) the movement of contaminated mowing equipment, 2) the movement of infested sprigs, 3) individual people

going from an infested location to a pest-free location. Therefore, it is critical that professionals and the public exercise caution when working in turfgrass that is infested with, or in a location known to harbor, scale insects or mealybugs in turfgrass.

It is best to clean equipment when moving from an infested site to another. When possible, pressure wash equipment that has moved through grass areas (e.g., mowers, spreaders, application equipment). Isopropyl alcohol or dish soap solutions can also be used to spray off surfaces as well as boots, clothing, and smaller equipment.

Mechanical Control

Scale insect and mealybug populations can sometimes be reduced by physically removing them from a planting. Although most scale insects and mealybugs are found near the base of turfgrass plants, collecting and discarding of grass clippings when mowing infested turfgrass areas may help reduce populations. Further, populations can be reduced via vertical mowing (verticutting) to reduce and remove thatch accumulation from a turfgrass stand, particularly for species like bermudagrass and zoysiagrass.

Cultural Control

Maintaining a dense, healthy stand of turfgrass while minimizing chemical inputs and disturbances is the best defense against scale insect and mealybug outbreaks. Follow UF/IFAS-recommended species-specific irrigation, fertilization, and mowing practices. High inputs of nitrogen fertilizer, drought stress, improper mowing height, and thatch over-accumulation can all contribute to increased scale insect and mealybug abundance.

Biological Control

Most scale insects and mealybugs are attacked by a suite of parasitoid wasps (Figure 15), predatory insects, and insect-parasitic fungi. In fact, these organisms typically keep scale insects and mealybugs below damaging levels in their native, natural habitats. However, when insects are outside their native habitat or are in intensively managed plantings, this ecosystem balance is often disrupted. Therefore, using IPM practices, like spot treating infestations with chemical tools, using insecticides that target primarily scale insects and mealybugs, and promoting ecosystem health, can help promote biological control activity.



Figure 15. Parasitoid wasp (Aphelinidae) attacking an armored scale insect.

Credit: Lyle Buss, UF/IFAS

The invasive red imported fire ant (*Solenopsis invicta*) is a key pest of turfgrass systems that can be dangerous for humans and animals, while also facilitating outbreaks of sap-feeding insects like mealybugs. Ants commonly tend to mealybug infestations, feeding on their honeydew excretions and defending them from predators and parasitoids. Therefore, it is important to manage fire ant populations with ant baits as part of a turfgrass mealybug IPM program.

Chemical Control

Scale insects and mealybugs are most effectively controlled with thorough coverage of systemic insecticides. Contact-toxic products often perform poorly because they must come into physical contact with the insect to work, and sufficient and uniform coverage can be difficult to achieve. In contrast, systemically active products are ingested during feeding. In addition, many systemic products are more compatible with natural enemies, which allows biological control to occur in between product applications. Since armored scale insects like bermudagrass scale feed from individual plant cells instead of the vascular system, control is more difficult and works more slowly. Scale insects and mealybugs are most easily killed when they are nymphs (crawlers) due to their small size and lack of wax. Therefore, monitor infestations and time applications accordingly when possible.

Always apply insecticides with a non-ionic surfactant to ensure good coverage and uptake. Systemic products like neonicotinoids are preferred because they have longer residual activity inside plant tissue. Broad-spectrum products such as pyrethroids and carbamates (Sevin) may initially reduce pests but are not active systemically, will

not provide lasting control, and will also kill natural enemies. Several combination products that contain pyrethroids and neonicotinoids (e.g., bifenthrin + imidacloprid) may provide initial high knock-down rates followed by longer systemic control. However, more work is needed to determine the long-term effects. The primary use case for broad-spectrum chemistries like pyrethroids is when making initial treatment applications to high-density infestations of mealybugs. Always follow label directions and restrictions, like the application site and annual application quantity restrictions, when applying these products and rotate modes of action to reduce the risk of insecticide resistance.

Secondary Pest Outbreaks

Secondary pests are those that exist below damaging levels in a planting until a disturbance (e.g., broad-spectrum insecticide application, plant stress event) gives them an opportunity to reproduce rapidly and reach damaging densities. Scale insects and mealybugs are among the most common secondary pest groups. Therefore, it is important to minimize disturbance like plant stress and killing off predatory and parasitic organisms.

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Tables

Table 1. Insecticides labeled for control of scale insects and/or mealybugs in turfgrass in Florida.

Active Ingredient	Trade Names	Chemical Class	IRAC Class	Application Site
Acephate	Orthene	Organophosphate	1B	GC, S
Azadirachtin	Azatin, Azaguard	Azadirachtin	UNE	GC, S, L
Beauveria bassiana strain GHA	BotaniGard, Mycotrol	Fungal agent	UNF	GC, S, L
Bifenthrin	Talstar, Menace	Pyrethroid	3	GC, S, L
Carbaryl	Sevin, Carbaryl 4L	Carbamate	1A	GC, S, L
Clothianidin	Arena	Neonicotinoid	4A	GC, S, L
Cyantraniliprole	Ference	Anthranilic diamide	28	GC, S, L
Deltamethrin	Deltagard	Pyrethroid	3	GC, L
Dinotefuran	Zylam	Neonicotinoid	4A	—
Essential oils	Captiva, EpiShield, TetraCURB Max	—	UNM	GC, S, L
Imidacloprid	Merit, Mallet	Neonicotinoid	4A	GC, S, L
Insecticidal soap	Many	—	—	GC, S, L
Neem oil	Debug, Rango	—	UNE	GC, S, L
Thiamethoxam	Meridian	Neonicotinoid	4A	GC, S, L
Zeta-cypermethrin + Bifenthrin + Imidacloprid	Triple Crown T&O, Golf	Pyrethroid + Neonicotinoid	3, 4A	GC, L
Trade names are not comprehensive and do not imply endorsement of products.				
Application sites: Golf course (GC), sod farm (S), landscape (L)				
All products should be mixed with a non-ionic surfactant prior to application unless the label says not to.				

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