



Ground Pearls

O & T Guide [T-#04]

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When warm season turf has irregular patches of thin, yellow, dead or drought-stressed grass and other common insect pests or pathogens are not evident, sift the soil to look for firm, spherical off-white to purplish-yellow ground pearls attached to grass roots or in surrounding soil.

Metamorphosis: Simple

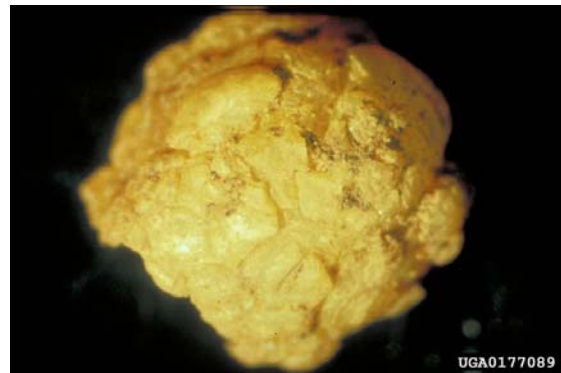
Mouth Parts: piercing-sucking in nymphs and adults.

Pest Stages: Nymphs

Scientifically: Ground pearls are members of the insect order Hemiptera, Family Margarodidae.

Typical Life Cycle: Generally, the life cycles and biological details for ground pearls are poorly known. Eggs are typically laid inside the female's waxy cyst amid shallow roots of host grasses. Eggs laid in spring hatch by late summer. → Series of Nymphs. After hatching, nymphs disperse, find new feeding sites, and begin to secrete their protective, spherical, off-white to yellowish-purple cysts. While many ground pearls establish themselves along the shallower roots of their hosts, some crawlers attach to grass roots 10-12 inches or more below the surface. Adverse conditions (severe temperature changes, drought, starvation, etc.) can trigger physiological changes in the nymphs, producing quiescent, long-lasting (sometimes a decade or more), environmentally-insensitive survival

stages. Ground pearls overwinter in their cysts. Male nymphs of some species become quiescent in early spring and external wing pads appear in the last nymph stage preceding adulthood. Female nymphs continue to mature without obvious changes and lack wing pads. → Adults emerge from their cysts probably in the spring when they move toward the soil surface where mating occurs. Females retreat to their waxy cysts to lay their eggs. At least one year, and probably two or more years, are needed for a complete cycle from egg to egg. At least one species in the southeastern U.S. is known from female-only populations; eggs hatch without fertilization, a situation known as parthenogenesis.



Closeup of a ground pearl cyst, *Margarodes* sp., actual size about 1/10 inch. Photo: C.A. de Klerk, Nietvoorbij Institute for Viticulture and Oenology, Stellenbosch, South Africa, www.forestryimages.org

Description of Life Stages:

Egg---minute, round and rarely seen.

Nymphs---Nymphs are the primary life stages that damage turf. Hatchlings or “crawlers” have six functional legs, dispersing along the roots of their hosts. The soft-bodied, segmented, oval but flattened nymphs attach to grass roots with their mouth parts. Cysts can range in diameter from 1/12 to nearly ¼ inch at maturity. The pearl-like appearance of the cysts gives these insects their common name.

Adults---Depending upon species, males may be winged (only one pair of wings) or wingless, while females are wingless.

Habitat and Hosts: All stages of ground pearls are found in the soil around roots or attached to roots of host grasses including Bermudagrass, Zoysiagrass, Centipedegrass, St. Augustinegrass and several genera of native range grasses. Ground pearls are widely distributed in the warmer parts of the southern U.S.

Damage: Severely infested grasses appear weak, thin, yellow and drought stressed; some plants can be killed. Damage is due to sap removal by the insects and toxins injected with their saliva.

IPM Notes: Turf managers may keep infested turf green, actively growing and competitive with these pests by adjusting fertilization, watering and mowing schedules to promote vigorous plant growth. Raising cutting heights to at least 1.5 inches in late summer may be helpful; avoid scalping turf at other times of the year. No pest resistant turf cultivars have been developed and no effective natural enemies that are known for ground pearls.

Because ground pearls can occur as deep as a foot in the soil and because they can become physiologically inactive when stressed, insecticidal control will be difficult at best. Currently no insecticides are labeled specifically for ground pearl control in turf although several soil treatments applied for other insect pests may have some activity. Wet soil to a depth of at least one foot before applying a soil treatment.

Ground pearl infestations are probably under-reported because they can be so difficult to find unless adequate root and soil samples are carefully taken and analyzed.

Do not confuse ground pearls with perlite, vermiculite, slow-release fertilizer particles, granular pesticides, seeds or similar spherical soil additives.