

Regional Pest Alert



Cycad Aulacaspis Scale

Aulacaspis yasumatsui Takagi

Origin and Distribution of Cycad Aulacaspis Scale

The cycad aulacaspis scale (CAS), native to Thailand, was first reported in Miami, Florida in 1996. Despite extensive regulatory efforts, CAS has subsequently spread to 43 of 67 counties and is considered established within Florida. CAS also was reported from Hawaii in 1998. Interceptions of CAS also occurred in Texas in 2002 and 2004 and in Georgia in 2004. Unconfirmed reports also indicate that CAS has subsequently established in Texas (Rio Grande Valley). Other known distributions of CAS include China, Singapore, Hong Kong, Cayman Islands, Puerto Rico, and the Vieques Islands, and the U.S. Virgin Islands. In 2004, CAS was detected in the Guam landscape, and the identity of CAS was confirmed in 2005. The introduction of this scale into Guam is not only impacting their ornamental landscape cycad species but also is threatening native cycad species.

Host Plants

CAS has been observed on cycads from three families (Cycadaceae, Zamiaceae, and Stangeriaceae) in Florida, but it is the *Cycas* species that seems most preferred. Two commonly grown cycads, queen and king sagos (*Cycas circinalis* and *Cycas revoluta*), are very susceptible to attack. In Guam, infestation of the endemic *Cycas micronesica* also is a concern.

Description of CAS

Scales feed by inserting their stylet-like mouthparts into the plant tissue. Like other armored scales, CAS produces domicile-like waxy covering (armor) that is not attached to the female body. The female armor is white, 1.2–1.6 mm in length, and may be pear-shaped (usually) or irregularly

shaped (occasionally). The female body, occasionally visible through the armor, is orange. The male armor is white, 0.5–0.6 mm in length and tricarinate (elongate with three parallel ridges). On the surface, the CAS resembles the magnolia white scale, *Pseudaulacaspis cockerelli*. However, the female body of the magnolia white scale is yellow and more elongate than the body of CAS. Male scales, although smaller than female scales, typically outnumber the females on infested plants.

Male (narrow) and female (broad) CAS

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Dense population of CAS

Life Cycle

Female scales normally produce 100 eggs or more during their lifetime. Eggs are deposited underneath the scale armor and hatch in approximately 8–12 days. Male and female scales develop from eggs into first instars (crawlers). Newly emerged first instars disperse by “crawling” and locate an appropriate feeding site. Dispersal typically occurs by crawling; however, first instars also may be dispersed by wind. Once crawlers have “settled,” they start feeding, molt to the second instar, and continue to feed at the same site for the remainder of their life. The scale sometimes settles on subterranean areas of the host, subsequently resulting in problems in using natural enemies for biological control. Female scales molt into the third and final instar (adult stage). The second, third, and adult stage of females are legless. Male scales molt into the prepupal, pupal, and adult





Cycad infested with CAS

stage within a few days. Adult males have legs, a single pair of obvious wings, and do not feed. Depending on the temperature, females will mature, mate, and produce another generation in 21–35 days.

Plant Symptoms and Monitoring

Although CAS crawlers initially settle on the trunk and base of the leaves, they also may infest the leaf blades, cones, seeds, and even the roots. Early symptoms include chlorotic spots on the upper side of leaves. CAS also can deform and kill new plant growth. Infested leaves become brown and desiccated as populations grow. Very dense populations result in layers of live and dead scales that form a “white crust” on infested plant surfaces. Heavy infestations eventually lead to plant death.

Pest management of CAS is difficult because 1) initial infestations typically go undetected or may be confused with those of the commonly occurring magnolia white scale, 2) rapid outbreaks are caused by high population growth rates, and 3) scales feed

in protected plant structures such as roots and at the bases of leaves, where they are not apparent.

Infested cycad plants in unmanaged landscapes act as pest reservoirs and are sources for infestation of “healthy” plants in managed landscapes. Check new plants before purchase to make sure they are not already infested with this scale. Monitor plants frequently for the presence of the scale or the initial symptoms, particularly in areas where this pest has been seen attacking sago and other *Cycas* palm species. Look for “white specs” (scale armor) in the crown and at the base of leaves.

Control Recommendations

Two natural enemies of CAS were introduced into Florida in 1997–1998 by University of Florida researchers: a predaceous beetle, *Cybocephalus binotatus*, and a parasitic wasp, *Coccobius fulvus*. Both have become established in southern Florida and contribute to the control of the scale. However, because of the explosive nature of this pest species, the natural enemies cannot provide acceptable control levels so far. Generally, management of CAS will require the use of oils, other conventional insecticides, or a combination.

Wash infested plants with high-pressure water sprays (before any insecticide spray) to dislodge dead and live scales. The second and third instars (adult female) cannot move back onto the plant. Apply horticultural oils and insecticides at recommended rates. Good coverage is extremely important to the effectiveness of contact sprays. Repeated applications may be necessary for heavy infestations, under certain weather conditions, and for some products. No single product will kill all the insects on your plants or prevent recolonization for extended periods. Typically, oils and contact

insecticides require more frequent applications (10 days to 3 weeks apart). Oils are generally safer to use and less detrimental to native and introduced natural enemies. Check for the presence of natural enemies and scales bearing parasitoid emergence holes before deciding which product to use. Applications may not be necessary during the winter and should be stopped when active scales are not present. An apparently clean plant may still harbor scales on its roots. Removal of heavily infested leaves may reduce population density but should not be done frequently because it may reduce plant vigor. Careful disposal of removed leaves is necessary to avoid spreading scales to other plants. Maintenance of clean, healthy plants probably will require a continuous investment of time and effort if CAS is problematic in the area.

For more information on cycad scale, visit our Web site at

<http://www.ncipm.org/alerts/cyadscale>

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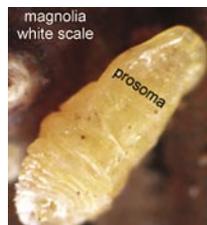
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Cycad scale with cover flipped off



False oleander scale without cover

