Sago, King Sago Palm  *Cycas revoluta*

**Propagation**

*Cycas revoluta* is usually propagated by seed or offset. Seeds are collected as they fall from the cone and should be stored open in a cool place for 4-12 months for after-ripening. Then remove the outer fleshy layer and soak the seeds for two days for best results. A fungicide dip before planting in sand or perlite will help to control rots. Offsets can be dug as they form to the side of the mother plant.

**Pests and Diseases**

The current Insect Management Guide for Commercial Foliage and Woody Ornamentals can be found at [http://edis.ifas.ufl.edu/IG012](http://edis.ifas.ufl.edu/IG012). The current Professional Disease Management Guide for Ornamental Plants can be found at [http://edis.ifas.ufl.edu/PP123](http://edis.ifas.ufl.edu/PP123).

**Aulacaspis scale** (*Aulacaspis yasumatsui* Takagi)

**Recognition:** Damage starts as chlorotic spots on the leaves. The scale insect, covered in a white waxy armor, will eventually cover the plant including the roots. The leaves under the insects become desiccated and turn brown, and eventually the cycad dies. New plant growth on infested plants becomes deformed. The mature female scale is white, pear-shaped to irregular shaped, and approximately 1/16<sup>th</sup> inch long. The male scale is white, elongate or rod-shaped and smaller than the female scale. The scale completes its life cycle in approximately one month; however, dead scale can remain on the plant for weeks, particularly if there is a heavy infestation.

The scale crawlers initially settle on the trunk and base of the leaves but will infest the leaves, cones, seeds and roots. Management can be difficult because an apparently clean plant may harbor these insects on it roots, which provide a constant re-infestation.

**Contributing factors:** This scale infests cycads in
three different families but has a strong preference for the *Cycas* species. The commonly planted king and queen sagoos (*Cycas revoluta* and *Cycas rumphii*) are highly susceptible and can be killed by this insect.

**Management recommendations:** Monitor your cycads often (particularly if you are in an infested area). When you see the scale, wash the plant with a vigorous water spray to clean off dead and live scale. Mature scales cannot move back onto the plant. If plants are heavily infested with the scale, remove the leaves to reduce the pest population. Take care when disposing of infested leaves so that the scale insect is not further spread. Apply a horticultural oil and/or insecticide. Spray coverage is extremely important. The number of applications depends on the severity of infestation, environmental conditions, and the product being used. Typically oils and contact insecticides will require more frequent applications (10 days to 3 weeks apart). Keep an eye out for natural enemies or scales that have holes (parasitized). Oils are generally safer to use and less detrimental to natural enemies. Oils include Ultrafine Horticulture Oil and Organocide (fish oil). Foliar insecticides available for homeowners include acephate (Ortho-Systemic Insect Killer) and Malathion (Malathion Plus). Malathion may cause phytotoxicity to new growth. Foliar insecticides for landscapers and growers include pyriproxyfen (Distance), acephate (i.e. Orthene), dimethoate (Dimethoate 400), dinotefuran (Safari). Soil insecticides for landscapers and growers include dimethoate (Dimethoate 400) and dinotefuran (Safari). Although some cycad growers claim that using spent coffee grounds and a weak “tea” made from old coffee grounds as a soil and crown application will control the scale with periodic repeat applications, research has not been conducted on this technique to prove its efficacy.

**Scale (magnolia white scale and others).**

**Recognition:** Feeding damage from scales results in yellow spots on leaves. Magnolia white scale is most common, but other armored or soft scales may feed on sago palms. Mature magnolia white scale are pear-shaped, shiny white scales 2-3 mm in length.

**Management recommendations:** Mature scales are difficult to control. Round holes in the scale bodies indicate parasitic wasps have emerged and are helping control the pest population. Contact insecticides should be timed to control crawlers, since matures are well-protected by a waxy covering. Systemic insecticides may be needed for severe infestations. Dead scales will still remain on the plant, however.
Mealybugs

Recognition: Mealybugs are conspicuous insects with waxy secretions covering their bodies. Some species have long filaments projecting from the rear of the body. They are mobile and congregate together, giving a cotton-like appearance to the foliage. They infest all plant parts and may cause discoloration and/or deformed foliage, and support the growth of sooty mold. Contributing factors: unknown

Management recommendations: Allow natural parasites and predators to work. If necessary, spray with approved insecticides.

Manganese deficiency

Recognition: The beginning stages of manganese deficiency are yellow-brown spots or streaks resembling a pathogenic disease. New fronds come out small and distorted rapidly turning from yellow to brown. Severe cases may have the foliage on the entire top half of the plant distorted and discolored gray/brown or dead.

Contributing factors: High pH and insufficient manganese are possible direct causes; however, any problem which restricts root growth and function can prevent the plant from obtaining adequate manganese for new growth. Root rot, under or over watering, poor drainage, or recent transplanting are all factors which may result in manganese deficiency symptoms.

Management recommendations: Check site conditions for underlying cause of the problem. Fertilize sagos regularly with a palm fertilizer containing manganese. If deficiencies occur, foliar applications of a chelated form of manganese may provide a short-term solution. Soil applications of manganese sulfate (.5-1 lb/plant) will help in the long run. Valuable plants may be potted up to try to improve root growth to correct the problem. Spotted leaves will not recover and may be removed after growth of new, healthy fronds occurs.
Sources


Federal and Florida laws require that all pesticides must be handled and applied in strict accordance with the label and worker protection standards (re-entry times, protective clothing, etc.). For complete information pertaining to use of any insecticide, follow the label. Mention of trade names or commercial products in this article is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the University of Florida.

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May 2010