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Asian Cycad Scale: New Threat to Cycads

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What are cycads?

A very ancient group of plants, cycads existed in the Permian era, more than 200 million years ago, even before the dinosaurs roamed the earth. Although once abundant across the globe, cycads are now greatly reduced in both number and distribution; there are now only about 250 species of cycads in 11 genera. All cycads are tropical or subtropical, and each genus has a restricted geographical range.

Cycads belong to the botanical group known as the gymnosperms, which are all ancient seed plants, and many are now extinct. Of the other gymnosperms still living today, the most well known are all the conifers, which include all the pines, spruces, firs and hemlocks, and the Ginkgo or Maiden Hair tree. Cycads resemble palms or tree-ferns in overall appearance, and some species are given the common name of sago palms. Cycads are immensely popular landscape plants, and are used heavily in tropical and subtropical landscapes from Florida to California. Cycas is the sole genus of the family Cycadaceae. The name cycas is from kykas, Greek for palm, referring to the palmlike growth habit. Cycads, however, differ greatly from palms in almost all aspects of anatomical structure and reproductive behavior.

Imported Asian Cycad Scale Although cycads may have outlived the dinosaurs, they face a major threat from yet another introduced insect from Asia. The Asian cycad scale, Aulacaspsis yasumatsui, also known as the cycad aulacaspsis scale, was recently found in Florida, where it has devastated

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cycads in tropical landscapes and nurseries. The Asian cycad scale, which has no known natural predators in the United States, produces extremely high populations on infested plants, often causing them to stop growing, decline and die. Attempts to control this insect by spray applications have met with only limited success. In addition to its prolific habit on cycad foliage, the Asian cycad scale can also feed on cycad roots up to two feet below ground! It is no small wonder that topical spray applications were not effective in controlling such an unusual scale insect. The Asian cycad scale has since spread rapidly throughout central and south Florida, and was even detected in Southern California in 2003. It can be assumed that cycads planted in exterior landscapes are likely at risk for attack, but cycads in interior landscapes may also be at risk. ***Microinjection of systemic insecticides*** It is not surprising that an exotic insect, with a high reproductive rate that can attack both foliage and roots, would be hard to control.

Last summer, Arnold Farran, director of research at the Mauget Company in Aradia, California, received a desperate call from Lauren Whitelock of the Cycad Gardens in Los Angeles, California. It seems that his prized and world-renowned collection of cycads were being attacked by the Asian cycad scale. He feared the worst, knowing that many cycad collections in Florida had already been lost. It was believed that trunk injection with a long-lasting systemic insecticide, such as imidacloprid, would be the best hope of controlling the infestation. Recent successes using trunk injections of Imicide to control the redgum lerp psyllid, Asian longhorned beetle and emerald ash borer indicated that they might have a chance to save the cycads at Cycad Gardens. Farran discussed the problem with me, and we set up a research trial at Cycad Gardens to test the use of Imicide capsules on Asian cycad scale. ***Results of injections*** We selected nine large cycads, Cycas reveluta and C. taitungensis, with visibly moderate populations of Asian cycad scale on their leaves. Asian cycad scale infestation is easy to detect, since the infested leaves appear white, as if a white powder had been dusted on them. Before injection, foliage samples were taken from each of the test cycad plants. Scale populations per leaf section were later made under the microscope. Five of the

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test cycads were injected with 3ml Imicide capsules, which contain a 10% formulation of imidacloprid. Some of the infested cycads were growing over a Koi fish pond. Therefore, the only treatment option in these cases was trunk injection. After 30 days, foliage samples from all nine cycads were collected, and Asian cycad scales counted. The Imicide-treated cycads had a 68% reduction in number of scales on the foliage, but the controls cycads also had a 47% reduction. However, it was in the next 30 days that the explosive potential for population increases of the Asian cycad scale became apparent. When 60-day foliage samples were collected, the control population of Asian cycad scale had surged to 2? times its original population. The Imicide-treated cycad foliage remained at 32% less than at the start of the experiment. It is not surprising that this scale insect is such a threat to the survival of cycads when it can increase at such a fast rate. Due to the known stability of Imicide in tree tissues, it is likely that control of this insect may continue in the treated cycads for up to a year and possibly longer. Lauren Whitelock has been observing his cycad collection very closely and has not noticed any re-appearance of Asian cycad scale on any of the Imicide-injected cycads. We intend to continue to monitor the test site for long term control of the Asain cycad scale with Imicide.

Editor?s Note: *Terry A. Tattar, Ph.D., is Professor Emeritus, University of Massachusetts, Amherst.*

February 2004