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Fern Scale Insects

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Fern scale insects, *Pinnaspis aspidistrae* (Signoret), are a significant pest of true ferns (not asparagus ferns) in the foliage plant trade. Infested fern plants are disfigured by the presence of male second stage armor which is conspicuously white against the dark green foliage. Ferns in commercial production sometimes tolerate a tremendous scale population with little noticeable reduction in vigor or overall color. Feeding by female scales causes yellow spots on some fern varieties. Female fern scales are oystershell or pear shaped, flat, light brown with the crawler cast skin a paler brown. Sometimes the second stage armor is also paler than the adult armor. They are 1.5 to 2.5 mm long. Males are tiny, two winged, gnat-like insects which are easily overlooked. The male armor has a light brown crawler cast skin and the rest is snowy white (Figures 1–3).

Fern scales are found on ferns in greenhouses, malls and homes. They are also found outdoors on liriope in the Coastal Plain and Piedmont. This pest has been recorded from numerous foliage plants, citrus and other woody ornamental trees and shrubs in Florida (Dekle 1976). Little is known about the biology of fern scales specifically. Female scales lay their eggs inside the armor. Eggs of armored scale insects are usually oval and about 0.2 mm long. The female dies after the last egg is laid. Tiny crawlers hatch from the eggs and eventually emerge from under the mother's armor. Fern scale crawlers are about 0.2 mm long, flat and yellow with red eyes. The legs and antennae are well developed. The crawlers move about until they begin to feed by inserting their long, thread-like mouthparts into the leaf and sucking out nutrients. The insect molts into a second stage which begins to secrete a waxy material from under the rear of the first stage (crawler) cast skin. Female second stage nymphs secrete an oval, pale brown armor about 0.8 mm long. Male second stage nymphs secrete a white armor which has three long ridges. Eventually these insects molt into the adult stage. Female scales begin to secrete the adult armor at the rear of the second stage armor. Males emerge from their second stage armor as tiny, gnat-like insects which crawl or fly to female scales to mate. The armor remains fastened to the plant long after the scale insect leaves or dies inside. When populations become dense, females tend to lay male eggs so

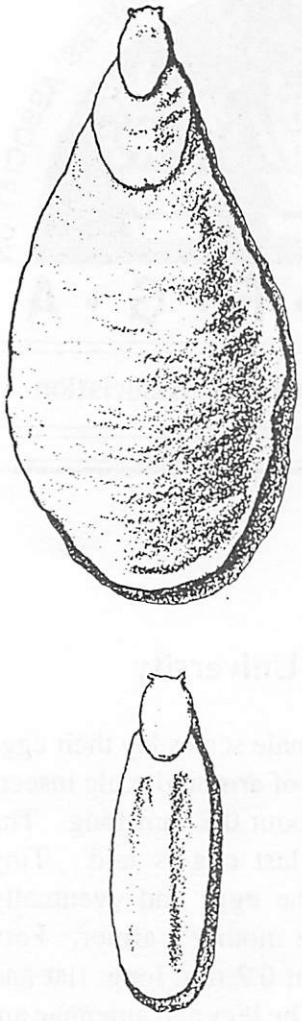

Figure 1. Drawing of a female (top) and male (bottom) fern scale.

Figure 2. Close-up of a colony of male fern scale.

Figure 3. Close-up of a female fern scale.

that heavily infested plants become conspicuously spotted by second stage male armor. Fern scales are sometimes parasitized by tiny wasps which may help to keep populations low on outdoor plants.

Control: Try to purchase plants from a supplier who does not have a fern scale infestation. When fern scales are encountered, some commercial fern growers use a combination of horticultural oil (such as Sun Spray™ or UltraFine™) and malathion 50 to 57% emulsifiable concentrate at half the normal rate (that is 2 Tablespoons of summer oil and 1 teaspoon of malathion per gallon of water) in order to avoid phytotoxicity to ferns. Two thorough treatments two weeks apart should give good control. Ferns are notoriously sensitive to pesticides. Whenever treating ferns and other sensitive plants, treat at a time that the pesticide will be dry on the foliage before the plants are exposed to full sunlight. However Oxamyl 10G can be used at the labeled rate (about 1/8 teaspoon per 6-inch pot) without damage to these plants.

A Demonstration of Fern Scale Insect Control: Ultra-Fine™ Spray Oil (UFO), Tame™, and a mixture of Ultra-Fine™ Spray Oil

and malathion were compared for control of scale on fern at the Entomology Ornamental IPM experimental greenhouse in Raleigh. The infested plants were donated by an unnamed grower from a commercial greenhouse. This donation is highly appreciated. Plants were maintained on benches in a polyethylene greenhouse and were hand irrigated. Treatments were applied with a hand-operated compressed air sprayer. There were 4 replicates with 2 plants per treatment in each replicate. Treatments were arranged on a bench using a random numbers table.

Table 1. Scale control on ferns in North Carolina, Aug.–Sept. 1991 at 14 and 28 days after treatment (DAT).

	Percent dead females (%)*		
Treatment (amt./gallon)	Precount	14 DAT**	28 DAT**
UFO (2 Tbs) + malathion 50EC (1 tsp)	5	100 a	100 a
UFO (5 Tbs)	4	98 a	100 a
Tame 2.4EC*** (1 tsp)	7	35 b	59 b
Check	6	14 c	10 c

*The Duncan Multiple Range Test (DMRT) was performed on arcsine square root transformations of data.

**Means followed by the same letter are not significantly different at P = 0.05.

***Lot no. CC14690.

Pesticides were applied on 20 and 27 August and 3 and 10 September. Scale-infested foliage was sampled on 20 August (precount) and 3 and 17 September and counts made of the number of live and dead female scales (Table 1). Some burn of pinnule tips was noted on plants treated with the oil plus malathion. Although the Tame did offer some control, it was not as effective as the Ultra-Fine™ Spray Oil alone or combined with malathion.

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by the North Carolina Cooperative Extension Service nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage and examine a current product label before applying any chemical. For assistance, contact an agent of the North Carolina Cooperative Extension Service in your county.

References Cited

Dekle, G. W. 1976. Florida armored scale insects. Florida Dept. Agric. Consumer Services Div. Plant Industry. Arthropods of Florida 3. 345 pp.

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