

Palm Insects and Their Control*

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Well-kept palm trees enhance the beauty, and lend interest to the Florida landscape and make real estate more valuable. Many insects inhabit palm trees, however. It requires vigilance to detect and control them before extensive damage occurs. A brief discussion is presented of some of the most important insect pests, with consideration of some factors affecting their abundance and management.

A few general comments are given concerning insect pest infestations. All parts of the trees are susceptible to attack by one to many species. Many insects present on palms are harmless to the plants and to man; some are beneficial. Most of the species which are damaging to the plants are held in check by their enemies. Occasionally conditions become favorable for the rapid multiplication of a species. Then many trees may be injured and some killed. Scale insects, *Aspidiotus destructor* Sign and *Chrysomphalus aonidium* (L.) on coconut leaves in 1956 and the royal palm bug, *Xylastodoris luteolus* (Barb.), in 1957 are examples of insects that recently reached and passed epidemic abundance. Epidemic populations of insects develop and occur periodically. Apparently there is great irregularity in the appearance of these epidemics which appear to be non-cyclic, dependent on conditions favoring reproduction of a species. Epidemic populations of harmful insects are not now predictable, nor

can the degree of harmfulness be foretold.

Palms are comparatively slow in reacting to severe insect infestations. As a result great damage or even death may occur before there is any manifestation of injury by the plant. The scale insect infestation of the coconut palms in 1956 is an example. In this instance the scale populations infesting the fronds reached their peak before most people realized that the palms were heavily infested. Hordes of ladybeetles feeding on the scale insects were observed by many and occasionally were blamed for the premature yellowing and death of the fronds. The author observed the onset of this epidemic about May, 1956, its peak about August, and the decline through September and October. Time for chemical control measures would have been early June.

Many species of insects infest palms. A total of 59 coconut palm pests was listed by Capco (1950) in the Philippines. Two endemic and 30 non-endemic species were listed by Simmerman (1948) as inhabitants of the genus *Pritchardia* in the Hawaiian Islands. Bruner, *et al.* (1945) listed 23 insect species as those which attack the coconut palm in Cuba, while 13 insects were named as pests of the royal palm. No compilation of palm infesting insect pests, other than that of scale insects by Riddick (1955), has been made for Florida.

Scale Insects

Most palms in Florida are infested by the coconut scale, *Aspidiotus destructor* Sign.; Florida red scale, *Chrysomphalus*

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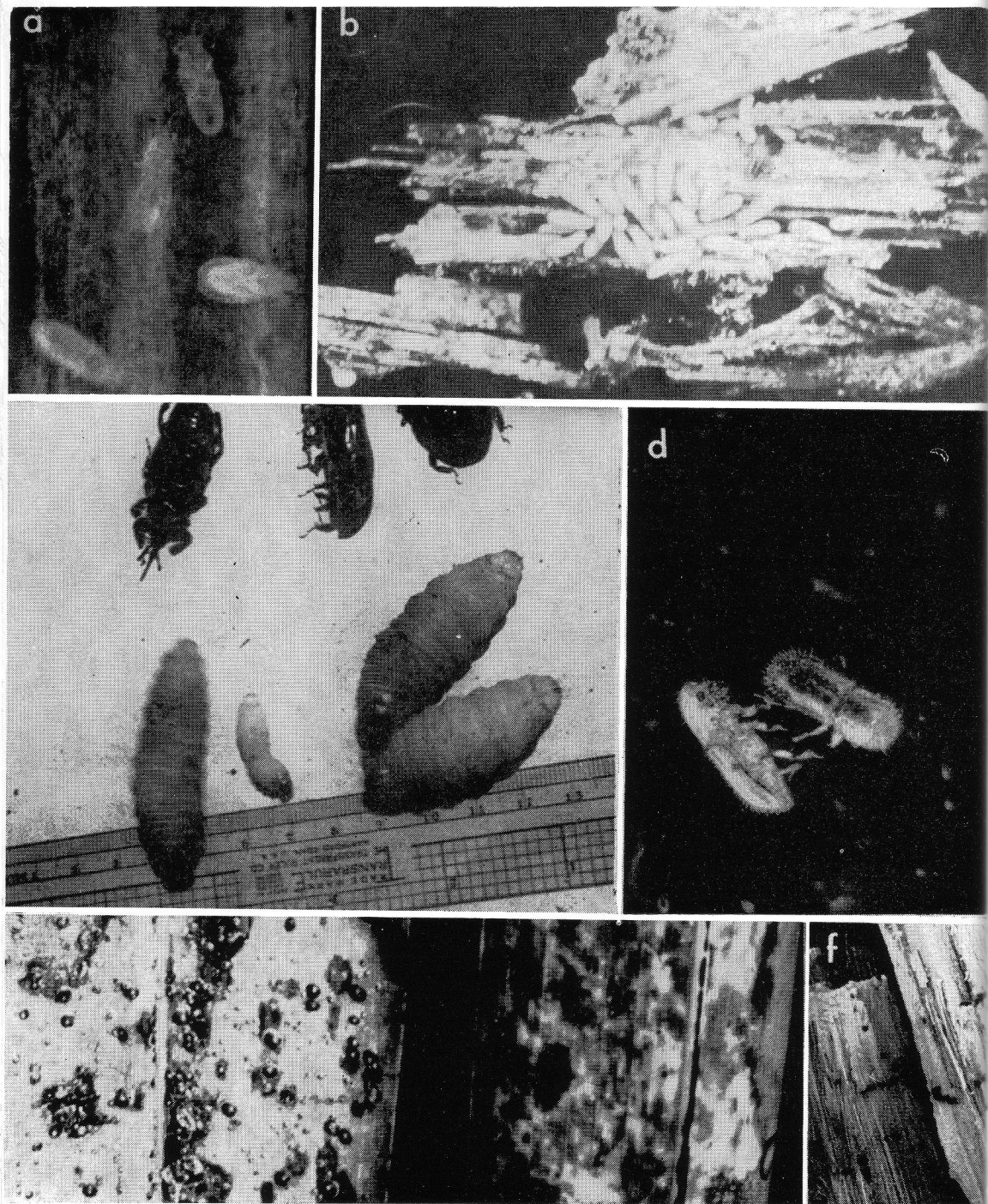


Fig. 58. Insects that attack palms: a, royal palm bug, much enlarged; b, termites in royal palm trunk, enlarged; c, palmetto weevil from *Phoenix* with adults at top and larvae at bottom, all slightly reduced; d, ambrosia beetles, much enlarged; e, Florida red scale on coconut palm, top of leaflet at left, bottom at right, all much enlarged; f, ambrosia beetle burrows, about natural size.

aonidium (Linn.), (Fig. 58e); *latania* scale, *Aspidiotus lataniae* Sign. Scale insects are probably more injurious to Florida palms year after year than any other group of insects. A total of 22 scale insect species is listed, Riddick (1955), as infesting the coconut palm and the same number the royal palm. A total of 20 scale insects is listed, Capco (1956), as pests of the coconut palm in the Philippines. A list of eight scale insect pests was given by Bruner *et al.* (1945) as those which attack the coconut palm in Cuba, while six scale insects were named as those which attack the royal palm.

Many coconut, Florida red, and *latania* scale insects infested the fronds of trees in Florida in 1956. This epidemic was concurrent with the application of malathion-bait sprays for eradication measures against the Mediterranean fruit fly, *Ceratitis capitata* (Wied.). As a result the sprays were frequently blamed for the scale infestations. Observations of palm trees on New Providence Island, Bahamas, however, where no malathion-bait spray was applied, showed that deterioration of the fronds from insect infestations was about equal to that in Florida. Conditions were favorable in 1956 for the scale increase and are believed to account for the epidemic.

Homeowners who wish to treat palms for scale insect control will get most effective results from spray applications. An oil emulsion spray containing $1\frac{1}{4}$ to $1\frac{1}{3}$ per cent actual oil in water is effective. Parathion at 0.15 to 0.30 pounds active ingredient per 100 gallons of water is probably more effective than oil emulsion. Trees may be injured by applications of oil. Parathion is very toxic to man and other animals. It should be used with caution and extreme care and only on trees some distance

from a residence or arterial highway. Malathion, which is safer than parathion, may be used for scale control but is less effective. A combination of one gallon of oil emulsion concentrate and four pounds of 25 per cent wettable powder of malathion may be used.

Above recommendations are for treating a few trees. Chemical control applications for trees on streets or other public property are considered impractical at this time for the following reasons:

(1) size of trees which makes coverage difficult because toxicant must contact each insect, (2) drift of spray mixtures to nearby objects and adjoining properties, (3) cost of treatment would be rather high for preservation of some green fronds, since trees are not killed by infestations.

Palm Leaf Skeletonizer

Palm fronds of several species are attacked by the palm leaf skeletonizer, *Homaledra sabalella* (Chamb.), according to Creighton (1937). It was a major pest in the decade 1930-1940, and is very common today but the populations are sparse. Larvae feed on the leaflets and usually go unnoticed until there is much injury. Most of the larvae are parasitized and perish without having been observed or of importance.

Conditions may become favorable again for increase of the skeletonizer and make application of chemical control measures desirable. Three pounds of lead arsenate per 100 gallons of water may be used, but a visible residue may remain. Nicotine sulfate (one pint of 40 per cent nicotine sulphate per 100 gallons of water) was reported by Wolcott (1933) to control the insect in Puerto Rico. Emulsion formulation of some of the newer insecticides—chlor-dane, dieldrin, lindane and malathion—may be used, applied according to suggestions on the container.

Ambrosia Beetles

Very small beetles about 1/10 inch long frequently burrow into trunks of coconut palms. (One species was tentatively determined by Howard V. Weems as *Xyleborus affinis* Eich.). These burrows are usually constructed in logs of recently cut or killed trees and in trees of low vitality. (Fig. 58d, f). Trees having low vitality lack pressure of "sap flow" to repulse attacks. Ambrosia beetles are contaminated with fungi which grow in the burrows. Larvae which hatch from eggs deposited by the beetles grow and develop by feeding on mycelia of the fungus. The fungi also extend beyond the insect burrows into the tree trunk tissues and frequently cause the tree to perish. It is frequently impractical or impossible, however, to determine whether the beetle infestations, fungal invasions or the low tree vitality was the most important factor in the death of individual trees. Trees that appear vigorous are sometimes infested. Sometimes a nearby pile or dump of removed trees may be the source of an unusually dense population of beetles. Injured trees or those of low vitality which often cannot be detected are attacked by ambrosia beetles.

Control of the beetles generally is achieved by keeping trees in vigorous condition and destroying or removing infested logs or trees. Those who wish to spray for control of the beetles may use benzene hexachloride or lindane. Two pounds of 10 per cent gamma-isomer of benzene hexachloride or one pound of 25 per cent gamma-isomer of lindane per five gallons of water for each tree trunk is suggested.

Coconut Flower Moth

A small grayish colored moth larva, *Batrachedra mathesoni* Busck, feeds on coconut bloom and destroys much fruit

production (correspondence Francisco Sein, Jr.). The larvae feed among the flowers, spinning some webbing which produces unsightly masses. This insect, although present, has not been a problem in Florida. The moth may benefit man by preventing fruit production on trees in parks and on streets. Liability for injuries from falling fruits necessitates removal of fruits before they fall.

Royal Palm Bug

Infestations of the royal palm, *Roystonea*, had not been observed for years. In 1957, however, the royal palm bug, *Xylastodoris luteolus* Barb. (Fig. 58a), infested royal palm trees throughout Florida. Leaves of larger trees were affected more noticeably than those on smaller trees. Fronds became yellow, then brown colored, and died earlier than is usual, making the trees unsightly. No tree is known to have been killed by the insect. Some interesting life history studies on this bug are reported, Baranowski (1958).

Control was achieved by sprays of chlordane and dieldrin. Emulsion and wettable powder formulations were equally effective at one pound technical chlordane or one-quarter pound technical dieldrin. Successful sprays were those applied by power sprayers. Airplane applications were not satisfactory in reducing bug populations.

Termites

Infestations of the smooth-headed, powder-post termite, *Cryptotermes cavirostris* Banks (determination by F. Gray Butcher), (Fig. 58b) occur in tree trunks. These infestations occur apparently in trees of low vitality where the tissues have become lifeless. Unsightly trunk scars occur from termite infestations and decomposition of the fibers.

The best control is achieved by main-

taining healthy trees. Applications of aldrin, chlordane, dieldrin or heptachlor to the initially infested areas might reduce the cavities in the trees.

Palmetto Weevil

The palmetto weevil, *Rhynchophorus cruentatus* Fab. (Fig. 58c), occasionally kills trees of *Phoenix canariensis*. Early infestation indications are reclining and falling fronds (Fig. 59). Such fronds are often loose enough to be pulled from the tree trunk. At the bases of these loose fronds very large white grubs may be found. (The same or a closely related species is called "gru-gru" in Puerto Rico and is an item of food.) These larvae hatch from eggs, develop in the tree, pupate and give rise to adults in the tree. The coconut palm, *Cocos nucifera*, is also infested with the beetle.

The beetle has been controlled by applying DDT and lindane to the center of the palm where new fronds are emerging. Lindane or benzene hexachloride is preferred to DDT, since scale insects do not increase following their application. Liberal amounts of the aqueous suspension, mixed according to the maximum recommendations listed, are suggested.

Greenhouse Thrips

Greenhouse thrips, *Heliethrips haemorrhoidalis* (Bouche), were found feeding on royal palm fronds. Other thrips species may be found. These insects remove or destroy the green color in leaves by rasping leaf tissue and sucking the plant juices. Infestations begin in the newly opened frond and soon the frond is yellow, then brown colored. Death of the leaf occurs earlier than usual. Thrips have not been numerous on palms in Florida.

Dieldrin, four ounces technical per 100 gallons of water from wettable powder or emulsion formulations, has

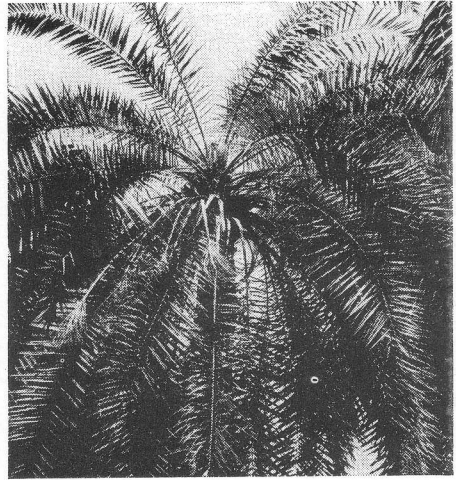


Fig. 59. *Phoenix* with reclining fronds loosened by larvae of palmetto weevil feeding in area producing fronds.

given excellent thrips control on mangos and avocados and is suggested for use on palms.

Mites

The tumid mite, *Septanychus tumidus* (Banks), has been taken from royal palm fronds. They have been observed in low populations without having been serious. *Brevipalpus* sp. also has been found on the coconut palm and not been serious. Other species are probably present but have not been recognized. On mite infested fronds the leaves appear dry and powdery in early stages of infestations. In later stages of mite injury dead brown leaf tissues are evident.

Sulfur is suggested if control is needed. If sulfur is ineffective, one of the newer miticides, such as Kelthane or Chlorobenzilate, may be tried.

A number of destructive insects affecting palms are not known to be present in Florida. The coconut rhinoceros beetle, *Strategus quadrioveatus* (Palisot de Beauvois), is very destructive in Puerto Rico, according to Plank (1948),

where larvae and adults feed principally in the trunk. It is significant to note that most infestations in Puerto Rico are observed about two years after hurricanes. Two other beetles, *Oryctes rhinocerus* Lind. and *Rhina oblita* Duval, harmful to coconut trees in other parts of the world, are not known to exist in Florida.

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