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CARIBBEAN FOOD CORPS SOCIETY

Annual Meeting
Georgetown, Guyana
1971

PUBLISHED WITH THE COOPERATION

OF THE

UNIVERSITY OF PUERTO RICO

MAYAGUEZ CAMPUS

1980

VOLUME IX

OBSERVATIONS ON THE CAUSES OF THE POOR COCONUT YIELD IN THE POMEROON, GUYANA

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Coconuts are very important in Guyana for the production of vegetable oil, margarine, soap and waternuts. Unfortunately, coconut production not only in Guyana (1) but also in tropical America is severely restricted by diseases and pests (2). There is a high mortality of coconut palms before they attain the age of ten years in the Pomeroon riverian area. Economic losses and disruption in the past have been observed but in all instances the precise nature and extent of damage remained unknown.

This investigation was, therefore, undertaken to find out the causes for the low yield of coconut palms in this region. The information hitherto unabailable would, hopefully, provide the basis for research and control programmes.

MATERIALS AND METHODS

The coconut cultivation in the Pomeroon River extends to about 25 miles on both river banks. Twenty coconut trees were randomly selected for every one to one half mile on either river bank. Individual trees were then examined in the crown, stem and roots for disease symptoms, insect damage or presence of the palm weevil, Rhynochophorus palmarum L., which is a vector of the red ring nematode, Rhadinaphelenchus cocophilus Cobb. A core sample was taken at different heights of the coconut stem with a 3/4" auger and a power motor saw and examined for red ring symptoms.

Soils samples taken from around the roots of each red ring infected tree were processed and examined for R. cocophilus by Cobb's technique (4).

Free soil water level was taken at two positions per site at two different times, one at low tide and the other at high tide. The general condition of the site was also recorded including tree density, average age of trees and average production per tree per year.

RESULTS

Of the 320 trees examined, about 7.3 per cent were infected with red ring disease, 30 per cent with bud rot, caused by the fungus Phytophthora palmivora Butler and 6 per cent infected with other insects (Table 1).

The palm weevil was associated with red ring, seventeen out of the twenty-two cases. Only in one case was R. cocophilus found in the soil sample taken from a tree infected only in the root. Infected trees were

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often found in groups in low-lying areas. Red ring disease incidence was almost absent in high sand reef and better drained areas (Table 1). Both root and top infection were observed together in only three trees out ot the twenty-two red ring infected trees.

About 30 per cent of the coconut trees between 3-15 years old were infected with bud rot. Bud rot infected coconut trees were found most frequently in poorly drained areas.

Several species of insects, (Strategus coleus F.) the large moth borer, (Castnia daedalus Cram.) and the rhinoceros beetle (Oryctes rhinoceros Linn.) were found in about 6 per cent of the coconut palms (Table 1). The Rhinoceros beetles were found to attack young palms 3-6 years old, whereas the other two insects also attacked older and larger trees.

Free soil water level varied between 4-18" and this level fluctuated by 0-16" with the rise and fall of the river.

DISCUSSION

The observations were made on growing plants randomly selected. Since dead plants were not examined, the cause of death cannot be stated with certainty. The observations primarily showed the proportion of coconut trees associated with the various diseases and pests.

Bud rot was observed in 30 per cent of the coconut palms examined. It seems the long hours of morning mist together with poor estate management created an ideal situation for disease spread.

Toxic soil conditions may be another factor contributing to the high death in coconut palms. This area is known to have poorly drained organic soils with substrata of 'caty' material (5). The coconut palm requires well-drained soils for best growth (3). Poor drainage, as evidenced by the relatively high level of the free soil water, is undoubtedly a factor responsible for low nut production (45-55 nuts per tree per year) of the entire region on the left bank of the river. This is to be compared with the nearby well-drained, sandy reef areas where production is over 100 nuts per tree per year and disease and pest incidence is lower.

Management practices were found to be generally poor. Dead and severely diseased trees are not removed and certainly serve as sources of inoculum for the spread of red ring, bud rot and as attractants for pests.

There was evidence also of the lack of proper weed control and fertilizer programmes.

It can be concluded that red ring, bud rot, insect pests, poor drainage and poor management together contributed to the low coconut yield in the Pomeroon area.

Table 1.--Number of coconut trees attacked by various pests and diseases in the Pomeroon River area

Sites[a]	Red Ring: Infected Trees	Red Ring: Kind of Infection	Bud Rot	Insects	Red Ring and Bud Rot	Red Ring and Insects	Bud Rot and Insects	Red Ring, Bud Rot and Insects	Location
1	-	-	4	-	-	-	-	-	
2	-	-	4	-	-	-	-	-	
3	2	crown[b]	7	3	-	-	1	-	
4	-	-	6	-	-	-	-	-	
5	3	crown[b]	9	3	1	1	1	1	Low lying
6	1	root[c]	9	-	-	-	-	-	
7	-	-	6	1	-	-	-	-	
8	3	2 crown[b]	7	1	1	-	1	-	
9	4	3 crown[b] 1 root	9	3	1	1	2	1	Low lying
0	3	crown[b]	9	1	1	1	-	-	Poorly drained
1	2	crown[b]	7	2	-	1	-	-	Poorly drained
2	-	-	2	1	-	-	-	-	Sandy reef
3	-	-	6	-	-	-	-	-	
4	4	3 crown[b]	7	4	1	2	2	1	Low lying
5	-	-	4	-	-	-	-	-	Sand reef
6	-	-	3	-	-	-	-	-	
	22		97	19	5	6	8	3	

a - 20 coconut trees were examined per site.
b - weevil present in crown of coconut tree.
c - Rhadinaphelenchus cocophilus present in soil sample.

SUMMARY

The general low yield and crop failures of coconuts in the Pomeroon River region were found to be due to the combined damage from high water table accompanied with poor drainage, insect pests (Strategus coleus F., Oryctes rhinoceros Linn., Castnia daedalus (Cram.); bud rot (Phytophthora palmivora Butler) and red ring (Rhadinaphelenchus cocophilus Cobb.) diseases. Insect pests, bud rot and red ring diseases were present in 6, 30 and 7 per cent of the coconut palms respectively.

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