



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

PROCEEDINGS
OF THE
CARIBBEAN FOOD CROPS SOCIETY



FIFTH ANNUAL MEETING
PARAMARIBO, SURINAM
JULY 24 – 31, 1967

VOLUME V

Cacao black pod disease control in Jamaica — A. G. Naylor

SUMMARY

Black pod disease caused by the fungus *Phytophthora palmivora* is by far the most important disease of cacao in Jamaica. In spite of increased plantings throughout the island over the past twenty years, production has not increased correspondingly and spot checks made indicated that black pod was damaging up to 70% of the pods in some areas.

Six fungicidal field trials were established during the fall of 1966 and early 1967 and the most striking disease control has been obtained by the use of Kocide fungicide (an 86% Cupric hydroxide) applied at 2 lb. per 25 gallons water with low volume mist sprayers at 3 weekly intervals. Between January and March 1967 black pod infection was reduced from 79% in the unsprayed plot to 10% in the plots sprayed with Kocide.

At one site (Caenwood Agricultural Station) seven fungicides were screened each on 24 plants and here Duter (a tin triphenyl hydroxide) gave best control with 3% black pod infection. The Kocide plot produced 5%, the Cupravit plot 9% and the Control plot 21% of pods infested with black pod.

As most of the infected pods were unmarketable, percentage disease infection gives a good estimate of percentage of crop lost from black pod. Spraying was estimated to cost £1 2.80 U.S. dollars per acre per cycle and would only be economical where yields and/or disease infection were high.

Cacao production in Jamaica

During the period 1957 to 1966, cacao production in Jamaica has not increased in spite of the fact that over 9 million seedling and rooted cuttings were distributed to farmers. The estimated production for 1966/67 is 1,500 tons whilst the 1957/58 crop produced 2,063 tons.

Yield in tons per year (1957—66)

1957/58	58/59	59/60	60/61	61/62	62/63	63/64	64/65	65/66
2,163	2,247	3,383	2,423	2,404	2,473	1,686	2,210	2,100

Several factors have been responsible for this decrease. Some of these are neglect of the old plantations, failure to take care of young plants, failure to plant a large number of the rooted cuttings or seedlings propagated, poor shade for young plants and little or no fertilizer application. The high incidence of black pod disease on the established plants, especially in the wetter areas, however, has largely contributed to the reduction in overall production. Heavy shade also aggravates the situation.

Trials established 1966—67

To try and reduce the loss of cacao due to black pod infection four field trials were established at Tom's River, Glengoffe, Egypt Pen and Mount Rose. Dithane M45 (Maneb plus Zineb), Cupravit (Copper oxychloride), Kocide (86% Cupric hydroxide) and New Blitane (Copper oxychloride plus Maneb) were applied respectively.

Between 400 and 800 trees were taken at each site and treated at three

weekly intervals,—the first two during the fall of 1966 and the second two during the 1967 spring crop. All the plants in the trials were fertilized with 1½ lbs 10—10—20 NPK fertilizer before spraying commenced and they were fertilized again in June and July 1967.

Two fungicidal screening trails were also established in the field at the Orange River and Caenwood Agricultural Stations during the fall of 1966 and spring of 1967.

Results:

During the heavy rainfall period of October and November 1966 disease control at Tom's River with Dithane M45 was poor. Spraying, however, reduced black pod incidence from 58—32% whilst in the untreated plots the disease increased from 39—49%.

At Glengoffe, disease control was fair but the crop was reaped on a few occasions by the owner and so the balance of the reaping records were not compiled.

During the spring crop at Egypt Pen very good control of black pod was obtained with Kocide. Commencing in late November 1966 and continuing at 3 weekly intervals until April 1967, 8 spray cycles were applied using 2 lbs Kocide in 25 gallons water per acre.

Applications were with shoulder mounted mist sprayers with approximately half a pint of spray mixture applied per plant.

Between January and March, black pod infection was reduced from average of 79% in the control plot to an average of 10% in the sprayed ones. From January—March there was heavy rainfall in the area, but during April and May however, when the weather was dry and the bulk of the crop was being reaped, there was very little disease in either the sprayed or unsprayed plots. For the period January—May 1967 the overall incidence of black pod in the unsprayed area was 29% and that in the sprayed plot was only 2%.

Table I

Cacao Black Pod Control with Kocide — Egypt Pen.
Number and percentage of pods healthy and damaged.

	Sprayed area (Record from 150 plants)			Unsprayed area (Record from 70 plants)		
	Jan. - March	April - May	Overall total and/or average	Jan. - March	April - May	Overall total and/or average
Total pods reaped	578	4 069	4.647	339	1.001	1.340
% Healthy	81	97	96	18	88	70
% Black Pod	10	0.3	2	79	11	29
% Rats	6	1	1	3	0.5	1
% Woodpecker	3	0.7	1	-	0.5	-
Average number pods reaped per sprayed plant —				Average number pods reaped per unsprayed plant —		
January — May 1967	=	31		January — May 1967	=	19

At Mount Rose where New Blitane was used, the disease incidence averaged 37% in the Control plots and 12% in the sprayed ones between January and March 1967, following 4 three-weekly spray applications. As at Egypt Pen, the bulk of the crop was reaped in May when the weather was dry and there was little black pod infection. The overall average infection at this site for period January—May 1967 was 5% in the sprayed and 19% in the unsprayed area. Rats damaged 7% of the crop at this site, and in January and February damage was much greater (See Table II).

Table II

Cacao Black Pod Control with New Blitane — Mount Rose
Number and percentage of pods healthy and damaged

	Sprayed area (Record from 130 plants)			Unsprayed area (Record from 50 plants)		
	Jan. - March	April - May	Overall total and/or average	Jan. - March	April - May	Overall total and/or average
Total pods reaped	1.090	1.530	2 620	546	617	1.163
% Healthy	72	98	87.2	51	95	73
% Black Pod	12	0.2	5.2	37	1.5	19
% Rats	13.4	1.4	6.4	10	3.5	7
% Woodpecker	2.5	0.4	1.2	2	0.0	1
Average number pods reaped January — May 1967	= 20			Average number pods reaped Jan.—May 1967=23		

Two fungicidal screening trials were established, one at Orange River Agricultural Station in October 1966 using 420 plants and another at Caenwood in February 1967 using 192 plants.

At Orange River, the fungicides tested were (1) Manzate D, (2) Dithane M45, (3) Cupravit, (4) New Blitane, (5) Perenox, (6) Cupravit + Dimethyl Sulfoxide (a penetrant).

Fungicidal applications at this site were put on between October 1966 and April 1967 at 3 weekly intervals using 60 plants per treatment. The incidence of black pod at this site was not very high (30% in the Control from October—March) but there was some beneficial effect from the use of Cupravit, Perenox and New Blitane.

Table III

Percentage of Cacao Black Pod obtained with different
fungicidal treatments at Orange River Station
October 1966 — May 1967

	Manzate D	Dithane M45	Cupravit	New Blitane	Control	Perenox	Cupravit DMSO
A	40	25	27	42	29	29	22
B	52	27	16	20	30	11	14
C	14	3	1	6	1	1	0.4

A = Period October — December 1966 — Rainfall 32.27 inches
 B = Period January — March 1967 — Rainfall 16.29 inches
 C = Period April — May 1967 — Rainfall 3.72 inches

Shading in the Manzate D plot was heavier than in the rest of the trial.

At Caenwood Agricultural Station during the spring crop of 1967, seven fungicides, as listed in Table IV, were screened for their effects on the control of black pod. Duter (tin triphenyl hydroxide) gave best result with only 3% of pods infected, followed by Kocide (Cupric hydroxide) with 5% and Cupravit with 9%.

Table IV

**Percentage Cacao Black Pod obtained with different fungicidal treatments — Caenwood Agricultural Station
 March — June 1967**

Kocide	Duter	New Blitane	Difolatan	Control	RH90	Polyram Combi	Cupravit
5	3	20	29	21	19	15	9

Rainfall March — June 1967: 23.34 inches.

Discussions:

The results of the preliminary field trials in Jamaica seem to indicate that cacao black pod can be controlled adequately with copper fungicides such as Kocide and Cupravit, and also with other fungicides such as Duter and New Blitane. Proposals have been made for the repeat of these trials during the fall crop of 1967 and spring crop of 1968. The testing of other fungicides is also to be included.

Preliminary assessment of the cost of spraying indicates that it costs approximately 20/— per acre per cycle for fungicides and labour to apply the chemicals. If heavy yields are obtained and black pod infection is high there is every indication that the expenses involved in controlling black pod of cacao will be more than justifiable.