

INCIDENCE OF COCOA BLACK POD DISEASE IN DAKSHINA KANNADA DISTRICT (KARNATAKA) —A MAJOR COCOA GROWING AREA IN INDIA

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Black pod disease of cocoa caused by *Phytophthora blattari* (Butl.) Butl. occurs in most of the cocoa growing countries (Gregory, 1974). Its occurrence in India was reported by Ramakrishnan and Thankappan in 1965. Among the diseases of cocoa occurring in India, *Phytophthora* diseases are found to be major on the basis of the extent of damage and nature of the disease. Based on the survey of diseases of cocoa occurring in S. India Chandra Mohanan and Kaveriappa (1981) reported that black pod disease has been observed in 93.4 per cent of the gardens surveyed in Kerala, Karnataka and Tamil Nadu States. Thus from the district wise distribution of the diseases and the percentage of gardens showing the disease incidence black pod has been found to be the most important cocoa disease in India.

Black pod disease occurs in India during the south-west monsoon period (June-September) with the maximum disease incidence in July-August, when there is high humidity with little sunshine. Reports on the losses of cocoa due to black pod reveal that the losses vary widely from year to year. Padwick (1956) estimated the annual loss from black pod as 10 per cent of the world crop. But in India no attempt has been so far made to find out the actual loss of cocoa due to black pod.

Materials and methods

A preliminary study has been undertaken during the year 1980 to study the incidence of black pod disease in Dakshina Kannada district, one of the major cocoa growing areas in India. In this area, cocoa is mostly grown as a mixed crop in the existing areca gardens. Five cocoa-areca mixed gardens from different localities in Dakshina Kannada district were selected for the studies on the incidence of black pod disease. These cocoa gardens of 10-12 years old were not sprayed with bordeaux mixture or any other fungicide during the year. The observations on the disease incidence were made during July-August, since the disease incidence appeared to be maximum during this period. In each garden observations were taken from five plots—one at the centre and four from different parts of the garden at random. A total of 125 plants with 25 plants per plot was subjected to the observations on the disease incidence in each garden. The data on the disease incidence on cherelles, young pods and nearly mature pods of each tree were recorded separately. The percentage disease incidence of each tree was calculated from the number of

Pods infected out of the total number of pods observed and the mean of 25 trees of each plot was considered as one replication.

Results and discussions

The percentage incidence of black pod in 5 gardens selected from different localities in Dakshina Kannada district is given in Table 1. The lowest disease incidence recorded is 12.93% and the highest 29.78%. The disease incidence varied significantly ($P=0.05$) from locality to locality or from garden to garden. During this season nearly mature pods were more when compared to cherelles or young pods and disease incidence was also more on nearly mature pods. In all the 5 gardens studied the disease incidence was significantly higher (22.83—40.84%) on nearly mature pods.

TABLE 1

Incidence of black pod disease in Dakshina Kannada district—a major cocoa growing area in India.

No. of gardens surveyed	*Mean percentage incidence of black pod disease (Mean values are after arc sine transformation)			
	Cherelles	Young pods	Nearly mature pods.	Mean of 3 age group of pods.
I	11.03 (19.40)	6.94 (15.28)	22.83 (28.55)	12.93 (21.08)
II	17.22 (24.52)	18.62 (25.67)	34.52 (35.99)	23.05 (28.69)
III	20.34 (26.81)	18.32 (25.34)	37.93 (38.02)	25.09 (30.06)
IV	11.89 (20.18)	20.12 (26.66)	38.78 (38.52)	22.70 (28.45)
V	33.64 (35.45)	16.58 (24.03)	40.84 (30.13)	29.78 (33.07)
Mean of 5 gardens	18.23 (25.27)	15.74 (23.38)	34.81 (36.16)	22.71

CD ($P=0.05$) for comparing gardens=5.62.

CD ($P=0.05$) for comparing different age group of pods=4.35.

*Mean of 5 replications (25 plants/replication) values in parenthesis are transformed values.

The incidence of black pod disease during 1980 in Dakshina Kannada district was 22.71% based on the studies in 5 unsprayed cocoa gardens. Thus it has been found that losses from black pod in India is very high and needs more attention. A more detailed investigation is necessary to find out the losses from black pod in India.

Losses of cocoa due to black pod have been estimated by various workers as : 50 per cent in Republic of the Cameroon (1969); 30-35 per cent in Nigeria (1971); 30 per cent in Ivory Coast (1964); 37 per cent in Trinidad (1969); 75% in Sri Lanka (1957) and 15-25 per cent in Brazil (1953) (gregory, 1974). In Ghana losses of cocoa due to black pod have been estimated to be 19% of the crop (Blencowe and Wharton, 1961). The black pod incidence varies from locality to locality and from year to year, mainly in relation to rainfall. It has been reported that some of the trees or clones may escape infection through bearing most of its crop in the dry season (Thorold, 1967). In India studies on these aspects are also very important since the cocoa gardens are mostly located in the high rainfall areas.

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