LEAF BLIGHT OF OIL PALM IN FOREST NURSERY AND ITS CONTROL

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A leaf disease of oil-palm raised in a nursery of Cox's Bazar Forest Division in 1980, is reported. Symptoms of the disease have been described. Three fungi were isolated of which *Curvularia eragrostidis* (P. Henn.) Mayer was the most frequent and consistent and was considered to be responsible for the disease. The leaf blight was successfully controlled by five weekly foliar sprays with either Benlate or Captan-5 with a solution of 56 gms in 12.5 litres of water for every 400 seedlings raised in polyethylene bags.

INTRODUCTION

Oil palm (*Elaeis guineensis* Jacq.) is indigenous to West Africa (Zeven 1965, Hartley 1967) where it grows wild in a 320–480 km coastal belt from Gambia to Angola (Moe and Mohtadi 1971) *E. guineensis* var. *tennera,* with thinner shelled fruits, is a hybrid of 'dura'– a wild variety with thicker shell and 'piscifera' with no shell (Rahman *et al* 1979). It is an exotic high oil yielding fruit crop from Malaysia and introduced in Bangladesh in 1978–79 with a view to developing the domestic non-conventional source of vegetable oil to meet the demand of both edible and industrial oils of the country. As such, Bangladesh Forest Department initiated raising 4047 ha of oil palm plantation in the high rainfall regions like Chittagong, Chittagong Hill Tracts, Cox's Bazar and Sylhet Forest Divisions in 1979, under a development scheme (Choudhury 1974, Rahman *et al* 1979).

Pest and disease free planting stock is one of the pre-requisites for successful plantation programme. Diseases of oil palm, specially in Africa, constitute one of the most serious constraints to successful oil palm cultivation and the output of palm because there are no effective and practical control measures yet known for many diseases, particularly those affecting the roots and stems (Aderungboye 1977, Rajagopalan and Aderungboye 1974).

About 40,000 oil palm seedlings were raised in 1979 in Cox's Bazar Forest Division for 1980–81 plantation programme

under the scheme. An outbreak of a serious leaf blight disease of the seedlings was noticed at 5–6 leaf stage in the first week of December, 1979. The disease took a serious turn by the first week of April, 1980. Most of the seedlings were affected with the blight. A study to find out the cause of the disease and work out measures for its immediate control was, therefore, undertaken. The present paper mainly deals with description of the disease symptoms, isolation of pathogenic fungi and the measures taken to control the disease.

MATERIALS AND METHODS

A suffieicnt number of dying and healthy seedlings in polyethylene bags were collected. The roots and leaves of the infected seedlings were examined with special importance to the distinct blight patches of the leaves. Isolations of fungi from both surface-sterilized (in 1 : 1000 mercuric chloride solution in water for 30–60 seconds) and unsterilized infected leaves were made on 2% Malt Agar (MA) and Potato Dextrose Agar (PDA).

Percentage of infection was determined by counting five randomly selected samples, each comprising ten seedlings. Four to five month old, moderately infected seedlings were used for field trials separately with two fungicides, Captan–5 Wettable powder (WP) (50 g a i/kg) and Benlate W. P (500 g a i/kg) in two blocks, each containing 400 seedlings. Spraying was done on 400 seedlings once a week with 56 g of either of the fungicides in 12.5 litres of water. The seedlings were thoroughly sprayed with a hand sprayer on both the surfaces of the leaves. After three sprays, each of the blocks was sub-divided into two halves, one receiving further two sprays and the other left unsprayed. During the trial, the seedlings in polyethylene bags (23 cm and 15 cm) were kept in an open place with wide spacing. The surrounding ground was kept clean and free from weeds.

OBSERVATIONS AND DISCUSSION

The roots of the dying seedlings were found to be healthy. There were distinct blight patches on the leaves which appeared first with the browning of the younger leaves and then extending to the older ones. Small irregular light brown spots or patches appeared to spread downwards from leaf-tips. Patches, in some cases, appeared near the tip or edge of the leaf or at the locations where the leaf had injury. The colour gradually changed into dark brown at the later stages of infection with a light brown transition zone of advancing infection court. Distinct demarcation between healthy and diseased tissue was noticeable. The lesions gradually enlarged and their centres dried out and turned grey. The leaves of heavily infected seedlings eventually rotted and ultimately the seedlings died.

Out of fifty seedlings examined, 14 percent were found to be healthy, 58 percent moderately infected and 28 percent severely infected and/or dead.

Three fungi identified as *Curvularia eragrostidis* (P. Henn) Mayer, syn. *C. maculans* (Ban.) Boed, *Colletotrichum* sp. and *Penicillium* sp. were isolated from the infected leaves. *C. eragrostidis* was consistently isolated from the infected leaves (Table 1) and is suspected as the causal organism. The dentification of *Curvularia* sp.

was later confirmed by Khan of Dhaka University in 1980 and in BRRI in 1980. *Colletorichum* sp. and *Penicillium* sp. were less frequently isolated. Various leaf diseases of oil palm like *Cercospora* leaf spots in Zaire (Kovachich 1954), in Nigeria (Robertson 1956), seedlings blight or *Curvularia* leaf spot from Malaysia (Johnston 1959) were reported previously. Turner and Bull (1967) reported that *C. eragrostidis* was the causal organism for oil palm seedlings blight in Malaysia and recommended timely application of Thiram or Captan for effective control.

no report of any fresh infection in this case. None of the fungicides at this concentration produced symptoms of phyto-toxicity like stunted growth or any other physical deformity on the seedlings. It is reported that systemic fungicides like Benlate can lead to the development of resistant strains of *Cercospora claeidis*. Hence, Dithane M–45 was suggested for fortnightly treatments at the pre-nursery stage when the seedlings are pricked out (Quillec and Renard 1977). Renard and Quillec (1977) from Ivory Coast recommended fortnightly foliar sprays of Benlate (100 g/1) against

Table 1. Isolation of fungi from infected leaves

Media used	Sample used	Inocula plated	No. yielding fungi	Type of fungi* (%) a	b	c
2% MA	Unsterilized	50	50	65	25	10
	Sterilized	50	40	88	5	7
PDA	Unsterilized	50	50	55	30	15
	Sterilized	50	45	80	3	17

*a=*Curvularia* sp. b=*Penicillium* sp. c=*Colletrotrichum* sp.

The two fungicides, 'Captan' and 'Benlate', were found to be excellently effective to control the leaf blight of oil palm at the Oil palm nursery of Cox's Bazar Forest Division.

Seedlings receiving only three weekly sprays showed a slow progress of blight symptoms on 35% and 15% leaves in cases of Captan and Benlate respectively. Five sprays with either of the fungicides at 56 gm/12.5 litre water per 400 seedlings were found sufficient to control the disease. There was

Cercospora leaf spot starting as soon as the plants are pricked out in the nursery. Rajagopalan (1973) in Nigeria studied the effectiveness of certain fungicides in controlling *Cercospora* leaf spot of oil palm. He found that of the nine fungicides screened against *C. elacidis* in the nursery and field, Dithane M–45 (1–2 lb/100 gal. water) followed by Difolatan 80 W was the best.

Neither Benlate nor Captan is locally available but Dithane M–45 can be procured from local dealers. Since the latter is

known to be very effective against *Cercospora* leaf spot of oil palm, it is suggested that the effectiveness of the fungicide should be studied in Bangladesh context. For most effective use, the time of application of any fungicide in relation to infection cycle is of vital importance. Therefore, further studies should be conducted to establish the pathogenicity of *C. eragrostidis* and to acquire precise knowledge of the etiology of infection.

ACKNOWLEDGEMENT

The authors are thankful to Mr. M. A. Bari, Divisional Forest Officer, Cox's Bazar Forest Division and his staff for their assistance in carrying out the field experiment. Thanks are also due to Dr. M. A. Rahman, Mr. A. C. Basak and Mr. Sohrab Ali of the Forest Research Institute, Chittagong for various help offered.

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