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SPEAR ROT OF OIL PALM (*ELAEIS GUINEENSIS* Jacq.) IN INDIA

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ABSTRACT

Spear rot is characterised by yellowing of inner whorl of leaves and spear rot, and causes drastic reduction in vigour and productivity. The extent of the disease is up to 1 per cent in oil palm plantations of Kerala. The disease has not been reported from Andaman Islands. Preliminary observations on the pattern of spread indicate that while fresh occurrences are sporadic, palms adjacent to the disease affected ones are more vulnerable to the disease. Occurrence is severe in low lying marshy places and slopes. *Fusarium moniliforme* and *F. semitectum* were isolated from spear rot affected leaves. As a precautionary measure, eradication of diseased palms in mildely affected plantations is recommended.

INTRODUCTION

Oil palm grown in different parts of the world are reported to have been affected by many diseases, of which, a few such as Ganoderma basal stem rot, stem rot, Fusarium vascular wilt and spear rot are the serious ones. Since the introduction of oil palm for commercial cultivation in India in 1971, only bunch failure has been reported to cause any significant loss (Anonymous, 1984). In recent years a new disease called spear rot disease has been noticed in the oil palm plantations of Kerala to the extent of one per cent.

Symptoms

The initial symptom of the disease is yellowing of the youngest whorl of leaves. Yellowing starts from tip of the leaves progressing towards the base. Marginal yellowing of leaflets with a green portion along the mid-rib is also characteristic. On close examination of the spear, water soaked lesions are seen at the distal portion extending downwards resulting in rotting and foul smell (Fig. 1). Examination of sixty disease affected palms of varying ages (3-15 years) revealed that rotting was confined to portions 50 cm above the meristem. The outer leaves remained green as in the case of healthy palms and the bunches produced were normal in the initial stages. The leaves emerging later on showed rotting and were reduced in size. With disease advancement (Fig. 2), the leaves became rudimentary with severe rotting. Though inflorescence initiation was noticed in axils of affected leaves, they became aborted before emergence, resulting in total loss of bunches. In older palms, tapering of trunk was noticed. The disease was nonlethal and debilitating in nature. Fish-bone leaf production was noticed on 5% the palms affected by this malady. Injuries due to Rhinoceros beetle infestation was noticed on 20% of the affected palms.

Occurrence of spear rot without

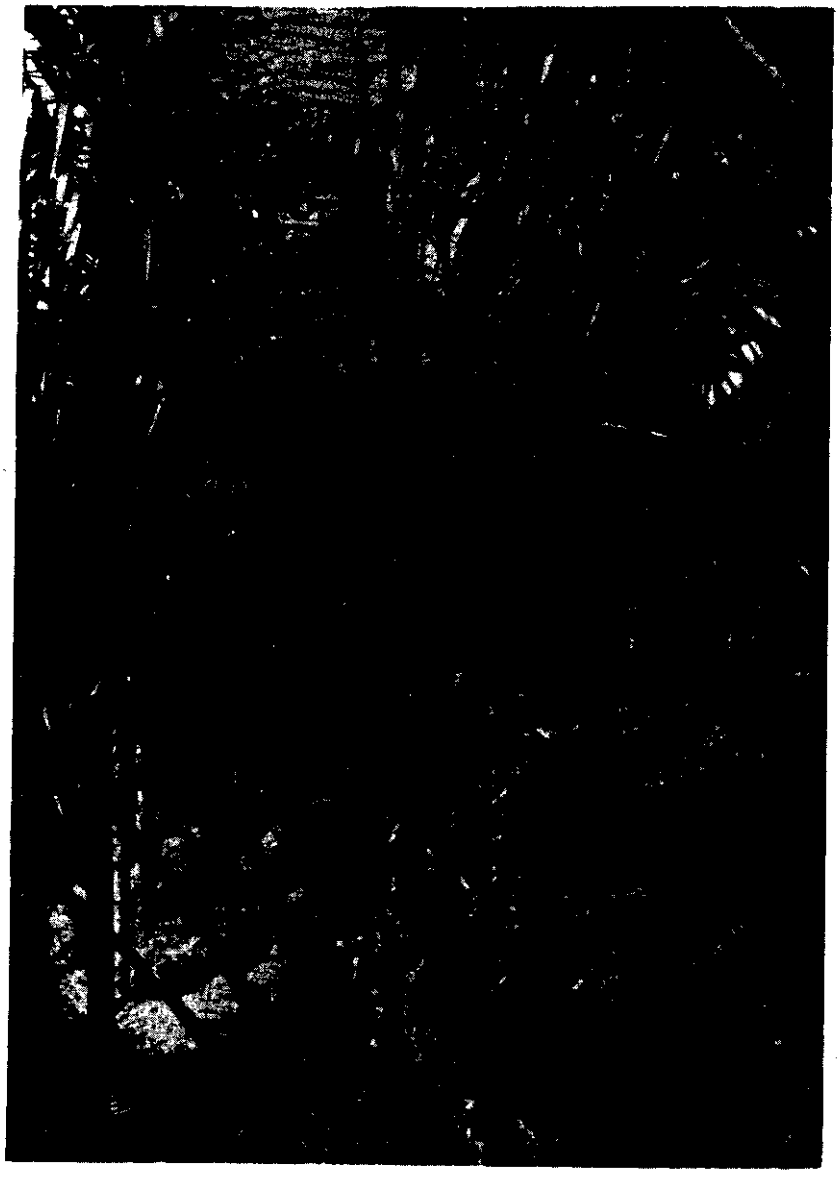

Fig. 1. Spear rot affected palm – early stage

Fig. 2. Spear rot affect palm – advanced stage

yellowing of the youngest whorl of leaves and *vice versa* was also noticed on a few palms. Such palms were not easily noticed since there is no yellowing of leaves.

Occurrence and Distribution

Initial occurrence of the disease was sporadic. The low lying marshy places and hill slopes were potential spots where disease incidence was more and the spread faster. However, there were low lying spots with no disease incidence either. Secondary spread was mostly on palms adjoining the diseased ones. Preliminary observations conducted at Palode, Chithara and Kulathupuzha plantations in Kerala for one year from June, 1985 to May, 1986 indicated a higher disease incidence during the rainy season.

Disease incidence was more on palms in the age group of 3-5 years (Table I). All the introductions (from Nigeria, Malaysia, Republic of Zaire and Ivory Coast) were found affected by this malady. Disease incidence was very high (18%) in the Tenera × Tenera population in the Palode plantation. The locations within a plantation played an important role in disease incidence and spread indicating the role of predisposing factors in disease occurrence or individual host-

Table I. *Incidence of spear rot complex in oil palm plantations of Kerala*

Plantation	Area (ha)	Total no. of palms	No. of Disease affected palms	Year of Planting	Source
CPCRI Palode					
Tenera x Tenera plot	1.42	200	36	1983	Palode
Germplasm Collections	2.21	310	16	1981	Nigeria, Ivory Coast, Palode, Zaire
Genetic Experiment	13.45	1882	24	1976	–
CPCRI, Kayangulam	0.12	16	1	1969	–
Oil Palm India Ltd.					
Chithara	1018.25	145511	743	1981 to 1984	Nigeria, Zaire and Ivory Coast
Kulathupuzha	493.82	69135	22	1982	Zaire
	233.3	32662	101	1983	Ivory Coast
	271.65	38031	31	1984	–do–

pathogen relationship or involvement of pathogens of other crop diseases.

Another interesting observation was the total absence of the disease in 1600 ha of oil palm plantations in Little Andamans, where introductions from Malaysia, Nigeria, Zaire and Papua New Guinea were planted since 1976.

Etiology

Isolations carried out from spear rot affected tissues yielded *Fusarium moniliforme* and *F. semitectum*. Pathogenicity experiments with the fungal cultures are in progress. Involvement of other etiological agents such as mycoplasma like organisms, virus, bacteria, nutritional deficiency and heavy metal toxicity is being investigated.

DISCUSSION

Spear rot is a consistent symptom of about six prominent diseases of oil palm in various parts of the world. This disease is quite different from the other diseases like nursery spear rot, crown disease or juvenile disease or spear rot-bud rot-little leaf disease complex, wither tip, fatal yellow and patch yellow (Turner, 1981; Turner and Bull, 1967). Although yellowing of younger leaves in spear rot complex is similar to that of fatal yellowing, the other symptoms (especially the non-fatal nature of this malady) do not tally. Reddy *et al.* (1984) reported that the spear rot affected palms in Yeroor plantations showed foliar yellowing. Often spear rot and yellowing occur independently. This requires

detailed investigation to prove whether it is a manifestation of different symptoms due to the same etiological agent of spear rot complex or independent etiology.

A careful scrutiny of the characteristic symptom, nature and pattern of spear rot diseases abroad in comparison with spear rot complex is suggestive of its independent identity. Turner (1981) opined that the oil palm in new environment may be prone to new disease problems. Dollet (1978) reported that Cadang-cadang viroid of coconut could infect oil palm in Philippines. Infectious spread to adjacent palms is suggestive of the involvement of biotic agents in this malady. Absence of spear rot complex in plantations of Andaman Islands is indicative of the possible role of environmental factors or pathogens of other crop diseases in Kerala.

The symptomatology and etiology of spear rot of oil palm seem to be different from those of cocnut root (wilt) and arecanut yellow leaf diseases. The characteristic symptoms viz., yellowing of outer whorl of leaves and flaccidity in arecanut yellow leaf disease and cocnut root (wilt) disease respectively are not noticed in spear rot affected oil palms. In yellow leaf disease of arecanut symptoms are prominent only after rains (October-November), whereas there is no seasonal change of symptom expression in the case of oil palm. Mycoplasma like organisms which are observed in tissues affected by coconut root (wilt) and arecanut yellow leaf diseases are not observed in the oil palm samples examined (J.J. Solomon, Per. Comm.)

Association of *Fusarium moniliforme* (Colombia and Cameroum) and *F. semitectum* (Colombia) with spear rot has been recorded (Anonymous, 1970). Preliminary observations indicate that eradication of diseased palms in mildly affected areas helps to contain the disease. Study on disease recurrence in replanted and adjacent palms is in progress.

There is considerable circumstantial evidence that attacks by *Oryctes rhinoceros* are the most important in promoting spear rot-bud rot-little leaf disease syndrome in the Far East, its incidence being greatest in young plantings when palms are most prone to beetle damage (Turner and Bull, 1967; Sharples, 1925). The possibility of injuries caused by Rhinoceros beetles serving as entry points for the pathogens spear rot complex will have to be studied.

The following precautionary measures are suggested: The severely affected palms are to be rogued and replanted. For palms in the early stage of disease, the affected portions should be removed and treated with a protective fungicide against *Fusarium* spp. A prophylactic spray to the spear leaves of palms during pre-monsoon period may help in tiding over fresh disease occurrence/spread. Strict plant quarantine measures to prevent the movement of oil palm planting materials from disease affected area in mainland to Andamans should be adopted.

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