

treatments would have adversely affected differentiation, as reported earlier by Churchill *et al.*, (1973).

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INCIDENCE OF LEAF BLIGHT DISEASE IN RELATION TO AGE, VIGOUR OF COCONUT SEEDLINGS AND YIELD OF PALMS

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ABSTRACT

Leaf blight disease caused by *Pestalotiopsis palmarum* was found both in seedlings and adult coconut palms. Adult palms of 20 to 40 years of age were highly susceptible to the disease. It reduced the height, leaf production and girth at collar of coconut seedlings to the extent of 10.4, 20.1 and 12.5 per cent respectively. The nut yield of coconut palms was decreased by 10 to 24 per cent due to leaf blight incidence.

KEY WORDS: Coconut, Leaf blight, Susceptible age, Vigour, Nut yield

Foliar disease like leaf blight and leaf spots cause reduction in vigour and yield of coconut. Though various organisms were reported to be associated with the leaf blight disease, the predominant organism is *Pestalotiopsis palmarum*. Leaf blight disease is also known as grey leaf spot of coconut.

Despite the widespread occurrence of the leaf blight disease in coconut, it is considered important disease perhaps due to its non lethal nature and because its presence in relation to growth and yield has not been clearly demonstrated. Assessment of susceptible age of coconut to the disease incidence will be useful to take appropriate control measures.

MATERIALS AND METHODS

Disease intensity was assessed in 4 months to 2 years old seedlings, 3 to 4 year old young palms and 5 to 60 year old East Coast Tall (ECT) adult coconut palms under natural infection to find out the relationship between leaf blight incidence and age of seedlings / adult coconut palms. Field experiments were conducted during 1991-95 at Coconut Research Station, Veppankulam to study the influence of leaf blight incidence on the vigour of East Coast Tall coconut seedlings in the nursery and to estimate the yield loss in adult palms due to the disease incidence. Disease intensity, growth parameters viz., height of seedling, number of leaves and girth at collar in healthy and diseased seedlings were assessed from fourth to twelfth month after sowing at monthly intervals. Twenty

Table 1. Intensity of leaf blight disease in relation to age of seedlings and adult East Coast Tall Coconut Palms

Age of seedlings/ adults palms	Mean disease grade *	Per cent disease index (PDI)*
Seedlings		
4 - 12 months	1.8	19.6 (26.3)
1 - 2 years	2.2	26.2 (30.8)
3 - 4 years	2.6	28.3 (32.1)
Adult palms (Years)		
5 - 9	3.1	35.4 (36.5)
10 - 20	3.6	40.2 (39.4)
21 - 30	4.1	44.3 (41.7)
31 - 40	4.2	45.4 (42.4)
41 - 50	3.7	41.2 (39.9)
51 - 60	3.4	37.4 (37.7)
C.D. (P = 0.05)	0.31	2.29

* Mean of 10 seedlings/palms

Figures in parentheses are arcsine transformed values

years old coconut palms with the disease grade of 1 to 9 were selected to assess the yield loss. The disease intensity and nut yield in the palms were estimated during July 1991 to June 1995. No fungicide application was done during the treatment period.

In the field experiments, disease intensity was assessed by the method described by Jayaraj *et al.*, (1986). Twenty five leaflets were selected from the middle of the five leaves from the lowest whorl from each palm and were graded in 1 to 9 score chart as described below. In seedlings of less than one year old, disease intensity was assessed in all the leaves.

Disease grade	Description
1	: No spot
3	: Less than 25% leaf area affected
5	: 26 to 50% leaf area affected
7	: 51 to 75% leaf area affected
9	: More than 75% leaf area affected

The per cent disease index was worked out as described by Horsfall and Heuberger (1942).

RESULTS AND DISCUSSION

The pathogen *Pestalotiopsis palmarum* (Cooke) Stey. was isolated from the infected leaves of the leaf blight affected seedlings and adult palms

Table 2. Effect of leaf blight incidence on the seedling vigour of coconut

Age of seedlings (months)	Disease intensity (PDI)	Plant height (cm)*		Number of leaves*		Girth at collar* (cm)	
		Healthy	Diseased	Healthy	Diseased	Healthy	Diseased
4	20.0(26.6)	38.0	32.5	2.50	2.00	5.00	4.00
5	24.6(29.7)	49.1	46.1	2.80	2.40	5.75	4.80
6	22.3(28.2)	64.6	58.6	3.80	2.90	7.50	6.00
7	21.7(27.8)	76.8	71.6	4.30	3.50	8.30	7.15
8	17.5(24.7)	83.0	75.8	4.60	3.90	9.25	8.00
9	20.2(26.7)	96.4	84.3	4.90	4.10	10.34	9.60
10	22.3(28.2)	102.5	88.7	5.20	4.20	11.50	10.00
11	25.5(30.3)	106.3	94.5	5.70	4.30	12.20	11.15
12	26.0(30.7)	118.5	106.5	6.10	4.60	13.35	12.00
Mean	22.2(28.1)	81.7	73.2	4.43	3.54	9.24	8.08

* Mean of 10 seedlings

PDI : Per cent Disease Index

Figures in parentheses are arcsine transformed values.

	C.D. (P=0.05)		C.D. (P=0.05)		C.D. (P=0.05)
Disease intensity	1.72				
Seedlings Height		Number of leaves		Girth at collar	
Age	1.49	Age	0.15	Age	0.56
Disease	0.70	Disease	0.07	Disease	0.31
Interaction	2.10	Interaction	0.21	Interaction	0.82

Table 3. Yield loss in East Coast Tall coconut palms due to leaf blight incidence

Disease intensity/ Category	Disease grade	Per cent Disease Index*					Nut Yield/Palm*				
		91-92	92-93	93-94	94-95	Pooled	91-92	92-93	93-94	94-95	Pooled
Healthy	1	12.3 (20.5)	12.4 (20.6)	13.8 (21.8)	12.4 (20.6)	12.7 (20.9)	90	91	88	89	90
Diseased-Mild	3	28.0 (32.0)	28.9 (32.5)	29.8 (33.1)	32.4 (34.7)	29.8 (33.1)	86	84	81	80	83
Diseased - Moderate Grade II	5	43.1 (49.2)	45.8 (55.0)	47.6 (56.1)	48.4 (56.1)	46.2 (54.1)	86	79	78	76	80
Diseased - Severe	9	71.5 (57.7)	76.0 (60.7)	79.6 (63.2)	84.0 (66.4)	77.8 (62.0)	83	74	71	68	74
C.D. (P=0.05)		2.64	3.22	2.92	3.40	2.48	2	3	3	3	2

* Mean of 10 palms

Figures in parentheses are arc sine transformed values.

in three per cent malt extract agar medium. Leaf blight incidence was found both in nursery palms and adult palms. It was observed from four months old seedlings to adult palms of 60 years age. The disease intensity increased with increase in age from seedling stage upto 40 years and then declined. Adult palms of 20 to 40 years were highly susceptible with a mean disease index of 44 to 45 per cent (Table 1). Leaf blight incidence both in seedlings and adult palms have already been reported. (Alonzo and Palomar, 1980; Abad, 1981). Papa Rao and Govinda rao (1966) reported severe incidence of leaf blight in young palms of 5 to 15 years. Seedling height, leaf production and girth at collar decreased by 10.4, 20.1 and 12.5 per cent respectively in diseased seedlings as compared to healthy seedlings (Table 2). Nut yield in leaf blight affected palms was found to be reduced to the extent of 10.0 to 23.6 per cent when compared to healthy palms over a period of four years. The nut yield decreased with increase in disease severity. There was a gradual decrease in nut yield in diseased palms year by year (Table 3).

Earlier workers (Abad and Magar, 1977); Warwick *Et al.*, 1991) also reported that leaf spot and blight diseases caused by various pathogens considerably decreased the coconut yield.

In the present study, it is concluded that the leaf blight disease incited by *P. palmarum* caused considerable damage to nursery and adult palms.

The disease incidence significantly reduced the vigour of coconut seedlings by means of decrease in seedlings height, leaf production and girth at collar by 10.4, 20.1 and 12.5 per cent respectively. The disease also decreased the nut yield to the extent of 10.0 to 23.6 per cent in adult coconut palms.

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