PRELIMINARY OBSERVATIONS ON TENDER NUT DROP IN ARECANUT

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ABSTRACT

Tender nut drop in arecanut reckoned as a serious problem in some parts of Kerala and Karnataka states, generally occurs during April-July. Symptomatology studies revealed the presence of one or more puncture marks on the surface of the affected nuts. Such lesions were found leading to the kernel causing dark brown discolouration. These symptoms were observed on 62 per cent of the freshly fallen nuts collected from 19 gardens during 1984-85. No fungus could be found associated with this malady. When healthy tender nuts were injured by piercing with a fine needle, 80-93 per cent nut drop was observed. Preliminary field control trial using fungicides, insecticides and a bactericide given as spray to the bunches revealed the efficacy of insecticides in reducing tender nut drop. The tender nut drop was the least in the Endosulfan (1.6 ml/1) treated palms.

The symptomatology, absence of any fungus in the affected nuts and the reduction in nut drop in the insecticide-treated plots suggest the possible association of an insect with tender nut drop in arecanut.

INTRODUCTION

Tender nut drop in arecanut (*Areca catechu* L.) has been observed as a serious problem during the last few years in Cannanore and Kasaragod districts of Kerala state and Dakshina Kannada, Kodagu, Chikmagalur and Shimoga districts of Karnataka State. In general, it was observed that the intensity gradually increased from April-May, reached a peak during June-July, decreased thereafter and reached the lowest level during September-October. This may be correlated with the susceptible stages.

Fungi like *Gloeosporium* sp., *Diplodia* sp. and *Colletotrichum gloeosporioides* Penz. have been reported to be frequently isolated from the buttons and a fungus and a bacterium from the fallen tender nuts (Anonymous, 1963; Saraswathy *et. al.* 1977). But the role of these organisms in causing tender nut drop was not established. Attempts have also been made to study the effect of growth regulators, insecticides, fungicides and fertilizers on the malady (Anonymous, 1960 and 1964). Earlier work carried out is inconclusive as to the cause of this malady and control measures. The present investigations were taken up mainly to study the symptomatology of the malady, associated fungi and field control.

Materials and methods

During 1984-85 freshly fallen nuts and intact nuts were collected in June-July from the affected area gardens in Kasaragod and Dakshina Kannada districts. The details on the general maintenance and management practices adopted by the growers were recorded from 10 areca gardens in 1984 and nine gardens in 1985.

Freshly fallen nuts as well as intact nuts from the affected palms were collected randomly and examined. Two hundred nuts (150 fallen + 50 intact) were collected from each of the 10 gardens in 1984. During 1985, 100 freshly fallen nuts were collected and examined from each of the nine gardens visited. Symptoms observed on the sample collected were recorded and grouped based on the symptomatology.

To find out the association of fungi if any, microscopic examination was done on 50 per cent of the samples and the remaining 50 per cent was used for the isolation of fungi. For this, different portions of the husk and kernel were surface sterilized and plated on potato dextrose agar medium. To study the effect of injury on nut drop tender nuts of 3-4 months old were surface sterilized and injured by piercing the fine needle of a syringe up to the kernel and slightly drawing out the contents. Five palms were selected and nuts in one half of the bunch (50 per cent nuts) in each palm were thus injured. The nuts on the other half of each bunch were surface sterilized but not injured. The whole bunch was then covered with a polythene bag.

A preliminary control trial was laid out in three private gardens forming three replications. The treatments were: (1) Dithane Z-78: 0.4% (4g/1), (2) Streptocycline: 0.04% (400 ppm), (3) Rogor : 0.16% (1.6 ml/1), (4) Endosulfan: 0.16% (1.6 ml/1), (5) Dithane Z-78 + Endosulfan, (6) Streptocycline + Endosulfan, and (7) Control (Bordeaux mixture 1%).

Each treatment was given to 10 palms per garden twice at an interval of 25 days as spray to areca bunches. All palms irrespective of the treatments received Bordeaux mixture (1%) spray 15 days prior to the treatments to prevent the incidence of Koleroga caused by *Phytophthora arecae* Peth. The pre-treatment nut drop and nut drop at 12-day-interval after the 1st day 2nd spray and nuts set/palm at the tender nut stage were recorded in each garden.

Results and discussion

Tender nut drop in arecanut was observed irrespective of the management and cultural practices adopted by the growers. Thus the incidence was observed in neglected as well as in well maintained gardens. On close examination of the tender nuts collected from 19 gardens during 1984-85, 62 per cent of the freshly fallen nuts revealed the presence of one or more puncture marks of pin prick size on the surface of the nuts, more usually towards the basal portion or calyx region. This puncture was found leading to the kernel causing dark brown discolouration. There was no other symptoms of infection or decay than the puncture marks on the surface of these nuts. Similar symptoms were observed on two per cent of the intact nuts collected from the affected palms. In some of the nuts the puncture marks did not reach the kernel, but this type of symptom was rare.

The intensity of nut drop varied from garden to garden. Among the dropped nuts collected from 19 gardens the tender nuts with puncture marks varied between gardens, from 8 to 98 per cent with a mean of 62 per cent. Among the rest of nuts 0-52% (mean 20%) and 0-40% (mean 13%) showed the symptoms of mahali and nut splitting respectively, whereas five per cent of the tender nuts were free of any such symptoms.

When tender nuts were punctured with a fine needle of a syringe 80 to 93 per cent nuts dropped within 10 days, whereas the uninjured nuts remained intact.

The results of the field trial laid out in three private gardens are summarised below:

Treatments	Net set (%)	Percentage of nut drop*		
		Pre-treatment	Post-treatment	
			After 1st spray	After 2nd spray
Dithane Z-78 (0.4%)	73.62	8.08	9.39	8.80
Streptocycline (0.04%)	71.60	8.93	10.96	8.51
Rogor (0.16%)	86.72	7.92	2.70	2.24
Endosulfan (0.16%)	88.38	9.89	0.98	0.29
Dithane Z-78 + Endosulfan	86.74	9.69	2.00	1.09
Streptocycline + Endosulfan	87.71	9.58	1.34	1.37
Control (Bordeaux mixture 1% alone)	74.02	6.16	11.37	8.44

*Mean of three gardens.

Of the seven treatments Endosulfan (1.6 ml/1) followed by Streptocycline + Endosulfan, Dithane Z-78 + Endosulfan and Rogor treatments showed a trend towards reduction of tender nut drop in arecanut. Nut drop was the least in Endosulfan-treated palms. The reduction in nut drop in the other two treatments viz. Streptocycline + Endosulfan and Dithane Z-78 + Endosulfan may be presumably due to the presence of Endosulfan in the mixture.

The symptomatology of this malady, failure in the attempts to isolate fungi, if any, and the results of the preliminary field trial suggest the possible association of an insect in causing tender nut drop in arecanut. These preliminary observations call for detailed investigations on the insects associated with this malady and large scale control trails using insecticides after the identification of the causal agent.

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REFERENCES

Anonymous (1960). Ann. Prog. Rept. CARS, Vittal for 1959-60. 92 pp. CPCRI, Regional Station, Vittal.

Anonymous (1963). Ann. Rept. CARS, Vittal, for 1962-63. 117 pp. CPCRI Regional Station, Vittal.

Anonymous (1964). Ann. Prog. Rept. CARS, Vittal for 1963-64. 110 pp. CPCRI Regional Station, Vittal.

SARASWATHY, N., REDDY, M.K. and NAIR, R.R. (1977). *Collectotrichum groeosporioides* causing inflorescence die back, button shedding and nut rot of betelnut palm. *Plant. Dis. Rep.* **61:** 172-174.