

NOTE ON 'CROWN-ROT' DISEASE OF COCONUT

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An unidentified disease of coconut recently took a heavy toll of young palms at this station. It was first observed in 1964 on 2 palms. In the following years 134 plants out of 1,000 palms in the orchard were affected. Reports of this disease are also available from other parts of Assam.

EXPERIMENTAL

The disease is mainly prevalent in palms in the age group of 3 to 6 years and rarely attacks the bearing palms. The first symptom is the emergence of shorter leaves with deformed, crinkled and rudimentary leaflets. These leaflets are associated with severe tip necrosis and their number in acute attack decreases progressively (Fig. 1) when the attack is acute. The attacked leaflets fail to unfurl and in many cases give a choked appearance of the frond (Fig. 2). As the disease progresses, severely necrotic, black, stick-like leaf-stalk devoid of any leaflet emerges. The outer whorls of leaves look healthy and remain green. In very early attack peripheral leaves crowd around the bud and prevent normal unfurling of the flag-leaf. In acute cases, necrosis of the primordial tissue takes place and the crown dies. The stem does not taper below the crown. Death of the affected palm is not sudden but it slowly loses vitality and finally succumbs within 3 to 4 years. Roots of the affected palms remain healthy and normal. Natural recovery of the affected palms is very rare. Mealy-bugs (*Pseudococcus* sp.) are often associated with the diseased plants. No fungal or bacterial pathogen could be isolated, although a culture of saprophytic bacterium was obtained. The possible viral origin of this disease was checked. Transmission through sap and mealy-bugs failed. N, P and K trials at different dose combinations did not show any improvement in the condition of the disease.

Nine applications of borax (sodium tetraborate), 20 g per palm per application through soil, were given to 20 severely affected palms in 3 sets. In each set 3 consecutive applications of boron were given at an interval of 15 days, followed by the rest in 3 months. The field was irrigated after each application of boron. After the first set of application was over, treated plants showed signs of recovery, whereas in the control plants diseased conditions remained unchanged. In all the treated plants, healthy leaves emerged after the application of third set of boron (Fig. 3).

The symptoms of the crown-rot are similar in many respects to those of the 'leaf-rot' of Sundararaman (1925) and the 'frond choke' of Dwyer (1937). The present disease differs from the leaf-rot in (i) the absence of any reddish-brown spots on the

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Fig. 1. Stunted leaves showing gradual loss of leaflets owing to necrosis (*left*), compared with a healthy leaf (*extreme right*).
Fig. 2. Advanced stage of crown-rot-affected palm, showing choked appearance of frond (*front*), and plant with normal leaves (*back*).



Fig. 3. Recovered plant after application of boron, showing the emergence of healthy normal leaves.

tender leaves, (ii) the absence of soft rotting of tissue, and (iii) non-pathogenic nature of this disease. Crown-rot can be distinguished from frond-choke by the following symptoms : (i) In frond-choke necrosis of leaflets and crown does not take place, whereas in crown-rot it is a diagnostic symptom; and (ii) In crown-rot the outer whorls of leaves remain normal throughout, unlike in frond-choke. The genesis and diagnostic symptoms of crown-rot are different from other diseases of coconut reported so far, hence it seems to be a new disease of coconut (Lal, 1959; Personal communication).

Menon and Pandalai (1958) considered potassium deficiency the probable cause of the degeneration of cells of midrib of coconut fronds, but the present observation attributes severe necrosis of fronds and crown to the degeneration of cell-walls, brought about by boron deficiency. Marsh and Shive (1941) observed similar situation in maize (*Zea mays* L.) suffering from lack of boron.

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