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CROWN CHOKE DISEASE OF COCONUT

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INTRODUCTION

The coconut palm *(Cocos nucifera* Linn.) is prone to several maladies in various parts of the country. Some of these are specific to some regions. Out of 1.229 million ha of coconut cultivated in India, Assam and West Bengal contribute 8000 and 17000 ha respectively with an annual production level of 54.3 and 186.6 million nuts respectively. Though large scale plantations are not met with in these states, coconut as a small holder's crop and as backyard crop has a great role to play in these two states to meet a part of the internal consumption. Though the crop is relatively free from serious pests and diseases except stray incidence of rhinoceros beetle and red palm weevil attack, and stem bleeding and bud rot disease, the major problem in these regions is the crown choke disease, so named in view of choking in the crown. Earlier it was also reported as crown rot disease.

OCCURRENCE AND SPREAD

An unidentified disease of coconut on two young palms was noticed at the Regional Coconut

Fig. 1. A 15 year old coconut palm showing the symptom of crown choking

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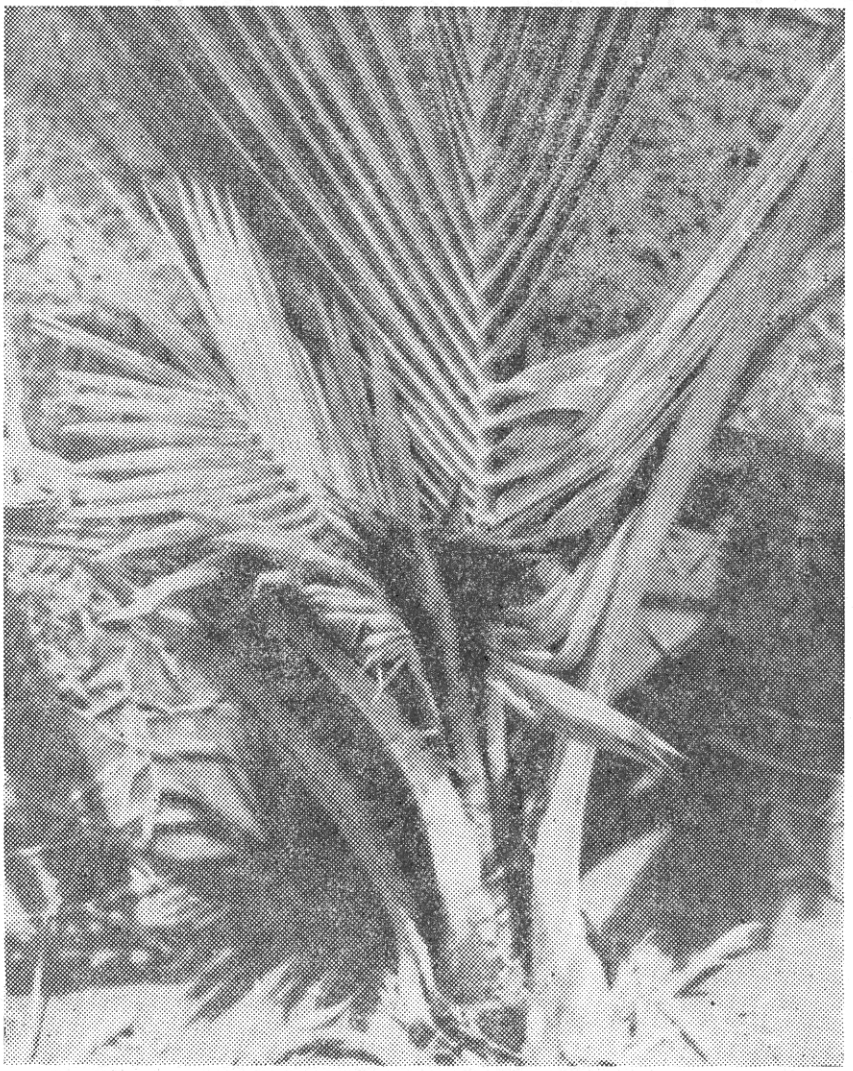

Fig. 2. Initial symptoms of crown choking in two year old coconut palm showing reduced leaves

Research Station, Kahikuchi, Assam in 1964. In the following years 134 out of 1000 palms in the orchard were affected. Report of this desease was also received from other parts of Assam during the same period (Chakraborthy *et al* 1972). In 1984 a rapid survey conducted in Assam revealed that 5-10% of palms, all under 12 years of age groups in the villages Kudrachenikudi and Nankar Bhaira were affected. Though the disease was prevalent in West Bengal no authentic information was available earlier.

A comprehensive collaborative survey was organised by CPCRI (ICAR), Assam Agrl. Dept. and Assam Agrl. University during 1985 to 1987 to understand the magnitude of the spread of the disease in Assam. Simultaneously a similar survey involving Agricultural Dept., West Bengal was also organised by the CPCRI. Though the survey could not cover the entire coconut growing areas, the available data indicate that the percentage of incidence was found to be less than 5% in Jalpaiguri and Darjeeling districts of West Bengal (Anonymous 1988 (a)). In Assam it was reported that 10.8% of palms are affected by the disease (Nair 1989).

SYMPTOMS OF THE DISEASE

The disease is mainly prevalent in the palms under the age group of 3 - 6 years. However, the occurrence of the disease was also noticed in adult bearing palms (Fig. 1). Similarly, occurrence of the disease was also noticed within one year after planting at Kahikuchi (Assam). The first symptom is the reduction of spindle and deformation of spindle tip followed by emergence of shorter leaves with deformed, crinkled and rudimentary leaflets (Fig 2). These leaflets are associated with severe tip necrosis and their number decreases progressively when attack is acute. The affected

leaflets fail to unfurl and in many cases give a choked appearance to the frond (Fig. 3). During the later stages of disease leaves crowd around crown and prevent normal unfurling of flag leaf. As the disease progresses, severely necrotic black, stick-like leaves devoid of any leaflets emerge. The outer whorls of the leaf looks healthy and remain green (Fig. 4). In acute cases necrosis of the primordial tissue takes place (Fig. 5). The stem does not taper below the crown. The death of the affected palm is not sudden but it slowly loses vitality and finally succumbs to disease within 3 to 4 years. Roots of affected palms remain healthy and normal. Natural recovery of the palms is very rare. Mealy bugs are often associated with the diseased palms.

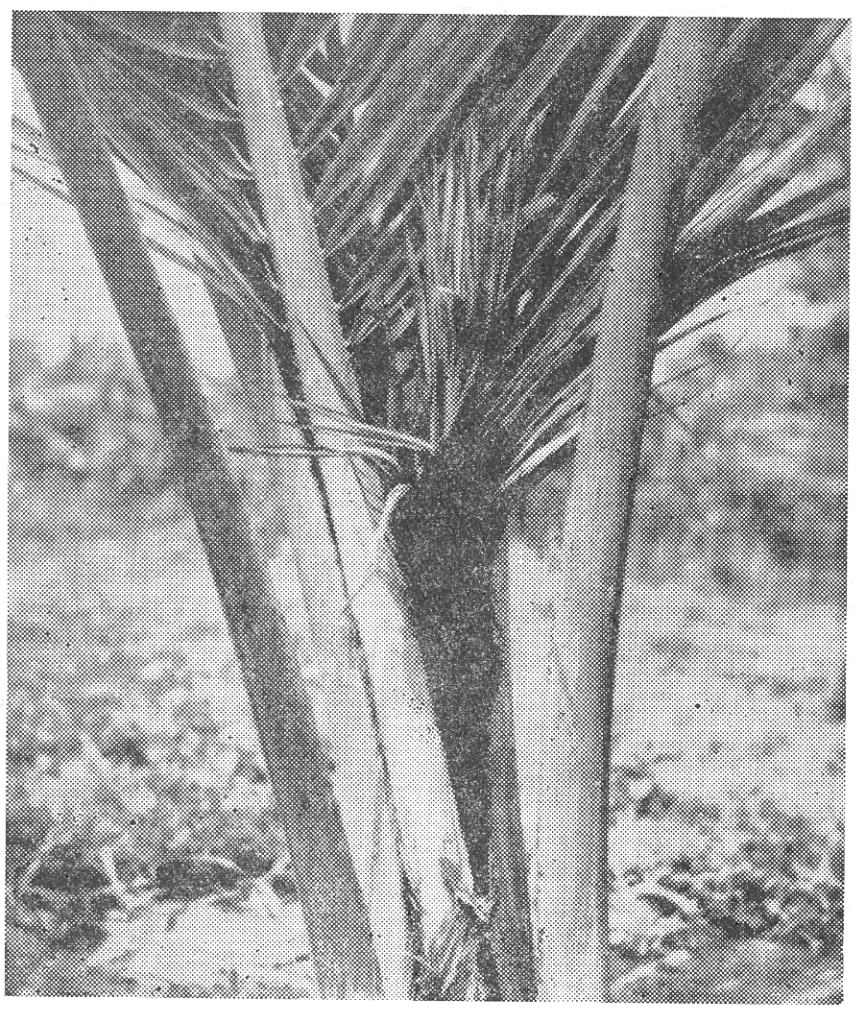

Fig. 3. Choking of young leaf in a two year old palm

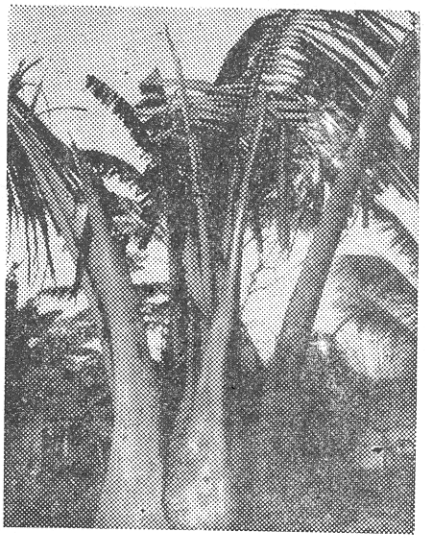

Fig. 4 Stick-like leaves in advanced stage of disease

AETIOLOGY

No fungal or bacterial pathogen could be isolated, although a culture of saprophytic bacterium was observed. The possible viral origin was also studied. Transmission through sap and mealy bug failed to produce symptoms.

Fig. 5. Rotting of primordial tissue in acute case of disorder

N, P, and K fertilizers at different doses also did not alleviate the symptoms. However, boron applications gave a positive response in controlling this disease in the earlier studies (Chakraborthy *et al* 1972.)

Subsequently the scientists from Central Plantation Crops Research Institute, Kasaragod and its research centres at Kahikuchi (Assam) and Mohitnagar (West Bengal) collected both soil and leaf samples in different locations where the disease is prevalent and analysed for micro nutrients. The analysis of the leaf samples from healthy and diseased palms showed that boron content was only 5.4 ppm in the leaves of diseased palms while it was 7.4 ppm in healthy palms (Anonymous 1988 a). The non-association of any pathogen with the crown choke malady and deficiency of boron in diseased palms, and response to boron application clearly indicate that it is only a micro nutrient disorder and not a disease.

MANAGEMENT OF THE DISEASE

In earlier trial nine applications of boron (sodium tetra borate) 20 g per palm per application through soil were given to 20 severaly affected palms. In all the treated plants healthy leaves emerged after the three applications of boron (Chakraborthy *et al* 1970). Chakraborthy *et al* 1972 also reported that surgery of the sheath is necessary to release the pressure of crowded leaves. Depending upon the severity one or two leaf sheaths are to be incised longitudinally. Later feeler trials indicate that application of borax at 50 g/palm along with recommended dose of NPK fertilizers helped in the recovery of the disease (Fig. 6) (Anonymous 1988 b).

RECOMMENDATIONS

Crown rot or crown choke disease prevalent in Assam and West Bengal is a disorder due to boron deficiency. It can be cured by the application of 50 g of borax (sodium tetra borate) along with

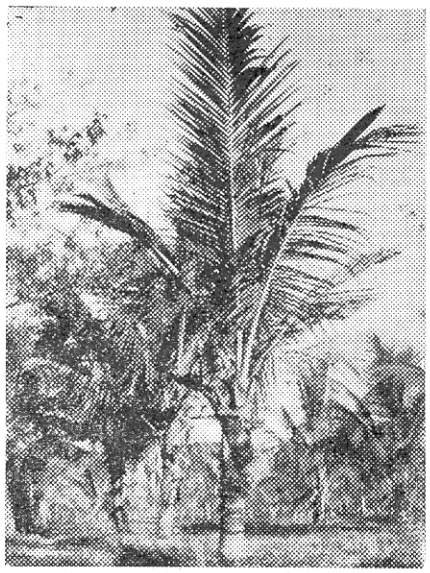

Fig. 6. Emergence of healthy leaf in crown choke affected palm (10 year old) after application of borax

NPK fertilizers (1.0 kg N, 0.5 kg P_2O_5 and 1.2 kg K_2O_5) per palm and farmyard manure or green leaf manure at 50 kg/ palm/year. In acute cases one more application of borax at 50 g/ palm should be given after a month of first application. In case of crowding of leaves surgery to cut one or two leaf sheaths to release the pressure is also necessary.

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