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GANODERMA OR ANABE DISEASE OF ARECANUT

CENTRAL PLANTATION CROPS RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
Kasargod - 671 124, KERALA.

GANODERMA OR ANABE DISEASE OF ARECANUT

Introduction

'Ganoderma' or 'Anabe' disease is caused by a bracket forming fungus. The disease is also known as *'foot rot'* or *'Betelnut plague'*. The disease was first reported on arecanut palm in the erstwhile Mysore State (now Karnataka) by Buchanan, 1907. The disease has been later reported from Kerala, Tamil Nadu, Andhra Pradesh and Assam States. Though next in economic importance to *koleroga* (fruit rot), the disease is considered to be dreadful on account of outright mortality of the affected palm.

A survey conducted from 1978-82 to assess the mortality rate revealed loss of 5-7% areca palms annually. In some endemic areas the incidence has been found to be as high as 20-25%.

Symptoms

The symptoms of the disease on arecanut and coconut palms are akin to that of drought. The initial visible symptom is yellowing of outer whorl of leaves, which gradually extends to the inner whorls. The leaves show wilting symptoms and droop down one by one. The development of infloresence/nut is arrested and nuts already formed are shed. The leaves are shed one by one leaving a tuft of one or two leaves along with the spindle at the centre. At later stages the weakened crown topples off leaving a bare trunk. The affected palms initially exhibit a dull brownish patch at the base of the trunk which later enlarges in size. A brownish gummy juice exudes from the patch (Fig.1). The lesion can be seen upto $^1/_2$ to 1 M height. The bracket or fruiting body *(anabe)* of the fungus *Ganoderma* develops at the base immediately after the death of the palm. Often, the bracket appears on the stumps only (Fig.2), after felling the affected palm. Occasionally the palms in the advanced stages of the disease also manifest the brackets of the fungus at the base of the trunk (Fig.3). On cutting open the affected palms, the internal tissues of the stem show brownish discolouration to about 1 M height from the ground level. The discolouration extends through the bole to the roots. The infected roots are discoloured, brittle, dry and exhibit musty smell. The fungal invasion results in interruption of water and nutrient uptake by the palm, leading to foliar yellowing and wilting.

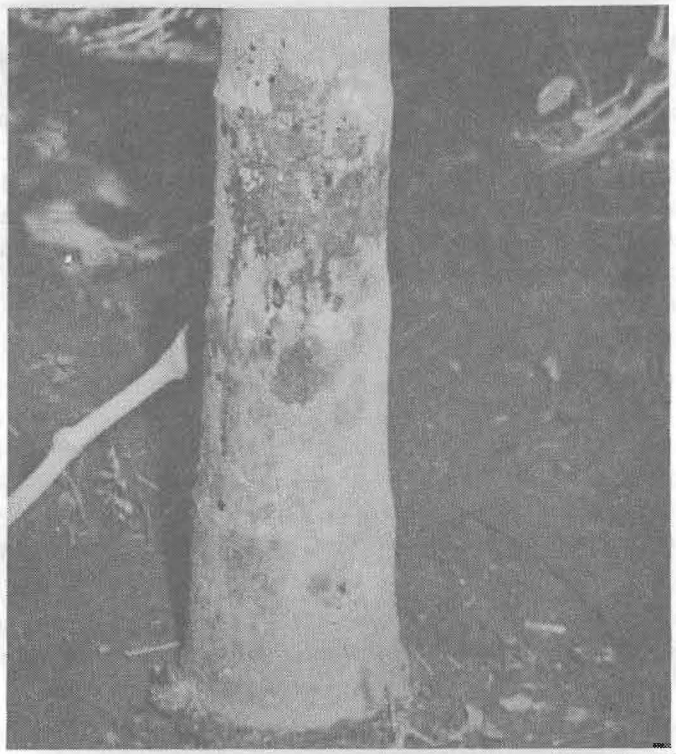

Fig 1. Palm showing severe gummosis due to anabe infection.

Fig 2. Left over stump showing formation of Ganoderma

Fig 3. Bracket formation in affected palm.

Cause of the disease

The disease is caused by the fungus *Ganoderma lucidum.*

Other hosts.

The fungus is also found to infect coconut, palmyrah, pongamia, tamarind, jack, etc.

Pre-disposing factors

Areca palms in the age group of 5-60 years are susceptible to the disease. The disease is more in light sandy loam soils than in heavy clay to clayey loam soils. Neglected, illdrained and closely planted gardens are more prone to the disease. Lack of phytosanitation is the major factor contributing to the disease incidence and quick spread.

Disease spread

Ganoderma is a root infecting fungus and spreads from plant to plant through soil by root contact. New infection centres appear when the roots of healthy palm comes in contact with infected roots or debris of affected stumps. Further spread is through root contact

between healthy and diseased palms. It also gets disseminated through water. Excessive irrigation or water logging, repeated ploughing, digging etc. in disease affected gardens will help in quick spread of the disease.

Management of the disease

Based on the trails carried out for the past 8 years on the management and control of the *anabe* disease, the following management practices are recommended for controlling/preventing the spread of the disease.

i) Phytosanitation : The stumps of diseased plams left in the field should be removed along with roots and destroyed by burning.

ii) Isolation trenches : Palms in different stages of disease development should be isolated from the neighbouring healthy palms by digging isolation trenches of 30 cm wide and 60 cm deep around the affected palms (Fig.4), so as to avoid root to root contact between healthy and diseased palms for preventing lateral spread.

Fig 4. Providing isolation trenches to avoid root to root contact.

iii) Cultural practice : Repeated ploughing or deep digging in the diseased gardens should be avoided, as this will help carry the infected material from the diseased site to the healthy ones. Irregular and closer spacings between areca palms (less than 2.7m x 2.7m) should be avoided. Good drainage system may be provided in illdrained gardens. Ganoderma resistant plant species like banana, ailanthus etc. may be used in cropping systems, which help to break the continuity of pure plantations and thus check the spread of the disease.

iv) Nutrient application : The health of the palms may be improved by supplying with normal dose of fertilizers at 100:40:140 of NPK per palm per year in two split doses viz., first in June (pre-monsoon) and second during August-September months. the organic matter content in soil must be increased by addition of 15-20 kg of farm yard manure and 15-20 kg of green leaf. In addition $1\frac{1}{2}$ to 2 kg of neem cake may be applied per palm during September each year.

v) Chemical treatment : Palms in the early stage of disease may be root fed with 125 ml of 1.5% Calixin solution at quarterly intervals i.e., during March, July, October and January.

vi) Containing the disease : Areca seedlings raised in infected gardens should not be transported to healthy areas/gardens for planting. In areas of sporadic occurrence, the diseased palms should be isolated from surrounding healthy palms by digging isolation trenches. The stumps on which the brackets appear should be removed and burnt along with root systems. The basins of affected palms are to be treated with 1.5% Calixin by drenching. All the palms in the infected gardens may be given $1\frac{1}{2}$ to 2 kg neem cake per palm along with recommended dose of organics and inorganics.

Text Prepared by : S.N.S. Kumar and K.K.N. Nambiar

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