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CEDROS WILT OF COCONUT IN GUYANA

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ABSTRACT

Since cedros wilt was identified in 1977, it has become epidemic in Guyana. In a recent survey in five of the six coconut-growing regions prevalence of the disease was determined as between 53.6% and 75% while on individual farms, the incidence ranged from 0%-40. The disease is now "notifiable" which means that the Chief Agricultural Officer has authority to implement certain control measures. The symptoms, pathogen and disease cycle for primary infection are described. The implications for the edible oil industry are discussed.

INTRODUCTION

Over the past decade, Cedros Wilt (also known as "heartrot" or "la marchitez de los cedros") has become epidemic in certain coconut-growing areas in Guyana and is now a "notifiable disease".

The identification of the disease was first confirmed in 1977 (Griffith, 1981a). However, symptoms now associated with Cedros Wilt, were described earlier by Dutchie (1938) and Bissessar (1962). They reported a "syndrome" which killed relatively young trees (5-25 years old) in the Essequibo Coast and Pomeroon River districts. The syndrome was, however, thought to be associated with unfavourable soil conditions.

The disease is widely distributed geographically and has been reported in Trinidad and Tobago, Suriname and in several countries in Latin America on both coconut and oil palms. There are no reports of cedros wilt on oil palm in Guyana.

HISTORY OF THE DISEASE IN GUYANA

Since Griffith's report, the disease was identified in 1982 at Timehri on the East Bank of Demerara. The few trees which were infected died, and no further cases have been reported in that location (Jones, 1986). In 1983, the disease was reported in Bartica, where, over a six-year period, it was reported to be the major cause of the destruction of more than ninety per cent of the coconut palms in that area. Fortunately, Bartica is relatively isolated and coconut palm cultivation is not extensive.

The problem on the East Coast of Demerara, received priority attention in 1984 when symptoms of the disease became more pronounced. The disease was positively identified in Mahaica in 1984 and in the Pomeroon area (from a single specimen) in the same year (Jones, 1986).

Since then, it has been observed on both the East Coast and West Bank of Demerara and on the Corentyne Coast. Infected trees have now been observed in areas stretching along the coastal plain in what is described as the "coconut belt" (Jones, 1986).

SYMPTOMS OF THE DISEASE

The symptoms of Cedros Wilt are similar to those of some other coconut-palm diseases. However, Griffith's key (1981b) provides a practical classification of diseases with wilt symptoms.

Characteristic symptoms are:

- Sudden wilting of the lower leaves of mature trees. The wilt progresses gradually upward, eventually affecting the crown leaves.
- Death of the terminal bud followed by putrefaction of the heart.
- Fall of immature nuts.
- Spear leaf becomes necrotic and can easily be removed from the plant.
- Inflorescence remain unopened and become dry and necrotic.
- The endocarp of mature fruit is discoloured.

Perhaps the best diagnostic characteristic is the presence of the flagellate, *Phytomonas* sp. in sap expressed from the growing point of diseased trees.

Usually, these symptoms appear either on isolated palms or on small groups of contiguous trees.

THE "PATHOGEN" OF CEDROS WILT

The protozoan flagellate, *Phytomonas* sp., has been found in the phloem elements of diseased palms and is considered to be the "causal organism". *Phytomonas* is readily observed when sap is expressed from the inflorescence, leaf petiole, and growing point of diseased trees. The organism is located in the sieve elements and apparently initiates wilting as a result of the extremely large numbers which clog the vascular tissue. *Phytomonas* has a promastigote morphology; at its widest point the organism measures between 1-1.5 μm and is approximately 27 μm long. The single flagellum is approximately 7 μm long and is inserted in a flagellar reservoir. The organism is usually attached to plant tissue by the flagellum which is attached at the blunter end of the body (Waters, 1978).

Griffith (1981) has reported isolating the bacterium *Micrococcus* (*agilis*) *roseus* from all organs of diseased plants. *Micrococcus* apparently causes rotting of the bud once the tissues have died. The bacterium was also present both in the insect vector and in the weed host.

THE DISEASE CYCLE

The cycle for primary infection is reported to involve a weed host, *Asclepias curassavica* (milk-weed) and an insect vector, usually the pentatomid *Oncopeltus cingulifer* (Griffith, 1986).

Oncopeltus sp. is regarded as a specific feeder and, on coconut estates where *Asclepias* is common, the insect completes its life cycle on the milk weed which has been reported to be a host for *Phytomonas*. During feeding, the bug takes the flagellate into its salivary glands, migrates to coconut palm and passes the *Phytomonas* into the sieve elements where they develop. The milkweed-bug can then migrate to and feed on other *Asclepias* providing new reservoirs of infection. The stink-bug *Mecistorhinus* sp. is also reported to be a vector of *Phytomonas* (Griffith, 1986). Although both *Oncopeltus* and *Asclepias* have been found on coconut estates in Guyana, the host-relationships with *Phytomonas* have not yet been confirmed.

The recommended management strategy involves: destruction of diseased palms; and proper weed control especially if milk weed is among the flora.

DISEASE SURVEY

In a recent survey, conducted by the Ministry of Agriculture and IICA, ten per cent of coconut estates in each of the main coconut growing areas were sampled.

Farms were selected at random from cultivation maps of each region. The distribution is shown in Table 1.

Table 1. Distribution of farms surveyed for Cedros wilt

Region	No. of farms sampled	No. of farms sampled by size		
		< 5 ac.	5-20 ac.	> 20 ac.
2	41	20	11	10
3	39	20	10	9
4	67	34	17	16
5	52	26	13	13
6	71	36	18	17

Preliminary survey results show that the disease is present in all of the regions. Cedros Wilt was reported on between 5 and 75 per cent of the farms while, on individual estates, the disease incidence ranged between 0 and 40 per cent. In the absence of complete analysis of the data, it is difficult to make further observations or to draw any conclusions.

The incidence of disease has reached serious enough proportions that the Ministry of Agriculture has declared it a "notifiable disease". This means that the Chief Agricultural Officer can take such action as is necessary (including destruction of affected trees) to halt the spread.

One of the consequences of the disease is the threat to the edible-oil industry of which copra is one of the main raw materials. Copra production has declined from 2,400 tonnes in 1978 to 672.5 tonnes in 1982. While there are other contributory factors--such as drainage and irrigation, green-nut consumption and poor management--cedros wilt is estimated to be responsible for between 4 and 10 per cent of the decline. With the

increasing spread of the disease, its effect on coconut and copra production could become much more serious.

The Ministry of Agriculture and the National Agricultural Research Institute have introduced training programmes for extension workers who are expected to spearhead the implementation of disease management systems in the affected regions.

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