

## FARMERS' AWARENESS OF CAPE ST. PAUL WILT DISEASE OF COCONUT IN THE CENTRAL AND WESTERN REGIONS OF GHANA

R. N. QUAICOE, J. T. DAKWA AND K. B AFRIM

*Oil Palm Research Institute, P.O. Box 74, Kade - Ghana*

### Summary

A total of 141 coconut farmers (66 and 75 from both the Central and Western regions of Ghana, respectively) were interviewed about Cape St. Paul Wilt disease of coconut through the use of a structured questionnaire during the last half of 1992. Farmers' responses indicated that the disease is still active in the two regions and that the disease fronts are widening. Awareness of the "Coconut Disease", however, remains very low in areas where the disease does not occur. In the Winneba-Agona Swedru and Nzema West areas, where the disease is still absent, 19 out of the 23 respondents and 16 out of the 20 respondents, respectively, were not aware of the disease. In the Cape Coast and Sekondi-Takoradi areas, where the disease outbreak recently occurred, 7 out of the 9 respondents and 17 out of the 22 respondents, respectively, were not aware of the disease. Awareness however, was high in areas where most coconut farms have been devastated; all 34 respondents from Komenda-Edna-Eguafo-Abirem (KEEA) and all 11 from the Nzema East, and 16 out of the 22 respondents from that Ahanta, were aware of the disease. Control measures attempted by farmers consisted of cutting without burning, cutting followed by burning and burning without cutting down the infected trees. Replacement of dead trees has been attempted in some of the affected areas. Nineteen of the respondents from the KEEA, 8 from the Nzema West, 6 from the Winneba-Agona Swedru, 2 from the Nzema East, and 2 from the Cape Coast attempted some form of control. Generally, in already established coconut farms, the only effective available control measure is prompt cutting out of infected trees after insecticidal fogging (hot fogging) of the disease outbreak focus, which depends on early successful detection of infection. Control measures attempted by some of the respondents were not effective because of wrong timing and procedure. Educating farmers on symptomatology and control of Cape St. Paul Wilt Disease, therefore, should be the first point of focus in any extension services on coconut in Ghana.

### Introduction

The coconut palm (*Cocos nucifera* L.) considered as one of nature's greatest gifts to mankind, and variously described as "the tree of life", "the tree of heaven; and as mankind's greatest provider in the tropics (Burkill, 1966; Pursglove, 1972), is of great importance to the coastal inhabitants of the Western, Central and Volta Regions of Ghana, where it is the main cash crop. In 1932 the Cape St. Paul Wilt Disease (CSPWD), popularly termed "the coconut disease," was reported at Weh, near Cape St. Paul in the Volta Region (Chona & Addo, 1970).

Within some few years, the disease completely wiped out the coconut industry at the Keta (Ketu) district. From the Volta Region, the next disease outbreak focus was reported at Cape Three Points in the Western Region in 1964, and

from there, it spread on all fronts (Chona and Addo, 1970). A third outbreak focus was reported at Old Ayensudo in the Central Region in 1982 (Arkhurst, 1988). Arkhurst (1988) reported the limit of spread of the disease in the Western Region to be at Axim to the West, Bakado (Sekondi) to the east, and Bankrom and Animakrom to the north, with a stretch of about 11 km from Bankrom to Agona Junction being free of the disease. In the Central Region, the limit was the confines of old Ayensudo. Cape St. Paul Wilt disease in Ghana, Kaincope disease in Togo, Awka disease in Nigeria, Lethal disease in Tanzania and Lethal Yellowing disease in the Caribbean Region, are thought to be identical (Maramorosch, 1964). In the Caribbean Region, Mycoplasma-like-Organism (MLOs), transmitted by a hemipteran insect vector, *Myndus crudus*, have been implicated as the causal agent of the

disease (Playsic-Banjac *et al.*, 1972; Hunt *et al.*, 1974; Howard *et al.*, 1983). MLOs have been isolated from similar diseased coconut tissues from Ghana, Nigeria and Tanzania (Playsic-Banjac *et al.*, 1972; Typmon *et al.*, 1993). *Myndus*, the vector of lethal yellowing disease in the Caribbean Region, does not occur in Ghana, but closely related species and other "Suspected insects" that occur in the coconut growing areas in Ghana, are being investigated for their role in CSPWD transmission (Dr S K Dery - personal communication).

Since 1932, "the coconut disease" has been spreading unchecked, wiping out all coconut palms as it advances (IDA, 1989-90), with affected farmers looking on helplessly. "Hot fogging" of disease outbreak foci, prior to cutting out of affected trees, helps to check the rate of disease spread (S.K. Dery and E.D. Arkhurst - personal communication). This method is so far, the only apparent effective control method available, since no CSPWD-resistant coconut variety has been found. The "hot fogging-cutting out" method, however, is very expensive and thus beyond the means of the average Ghanaian farmer, without governmental participation, which unfortunately has not been existent, hence the lack of any effective control measure to date.

However, it is obvious that such a control measure can only succeed with the active involvement of farmers, a situation which requires a high level of co-operation with regard to CSPWD awareness on the part of the farmers. This study was therefore undertaken to assess the level of awareness of farmers about the CSPWD and their willingness to work closely with research scientists in finding a solution to its control.

### Materials and Methods

A questionnaire on Cape St. Paul Wilt Disease structured to bring out information relating to:

- i. Particulars of farms - size, age, type of coconut, source of planting materials, location and environment of farm;
- ii. Record of Cape St. Paul Wild attack;
- iii. Control methods practised;
- iv. General knowledge about severity of coconut diseases;

- v. Willingness to co-operate with research scientists to find solution to the Cape St. Paul Wilt disease;
- vi. Suggestions on all aspects of the coconut industry in Ghana, were distributed to farmers in the Western and Central Regions. Farmers' responses to the questions were analysed. Any report of premature fruit drop, accompanied by yellowing of fronds followed by rapid death of the coconut palm, was considered as a possible case of Cape St. Paul Wilt attack. Any attempt by a farmer to eliminate or replace disease palms, was taken for a disease control measure.

Respondents were classified according to the location of their farms, as summarized below:

### Area

#### Towns/Locations

- i. Sekondi-Takoradi: Kansaworodo, Ntankoful, Shama Junction Kwesimintsim, Bakado, Essipon, Dompem Nkwanta, Anagye
- ii. Ahanta West: Pretse, Aboabo, Abura, Adjambra Ahuntumono, Sese Road, Busua, Akwadae, Bebeaniha, Azani, Ybiw, Apowa, Camp 3 Junction, Ewusiejo, Boroko, Princess Town, Krakrom, Kajabil, Agona Junction, Tumentu.
- iii. Nzema East: Nmiabessa, Agona, Yediyesele, Ndetiem, Awukyire, Alabokazo
- iv. Nzema West: Half-Assini, Allowule, Sawnu, Ngelekazo, Bonyere, Jaway, Ellenda, Tikobo No. 1, Kabenlasuazo, Nuba.

#### Central Region

Komenda-Edna-Eguafo-Abirem (KEEA): Ayensodu, Abakano, Mpanyiese, Dompuae, Enyinaisi, Benyanadze Edwenase, Agyekrom, Dabre

Cape Coast: Abura, Koforidua, Potubiw, Nyinesin, Efutu

Winneba and Agona Junction: Kokobeng, Akoley, Gomoa Ajumako, Ankamu Gomoa, Ankamu Ajumako, Ajumako, Enyan-Main, Esiam, Ajumako Ochiso, Anomabu, Anomabo-Tuafo, Kromantse, Abonko, Agona Swedru, Otabirkrom, Mankrom Junction, Akwasa, Winneba, Alekyedo, Central Ahanta East.

**Results**

The distribution of respondents and the acreage of farms covered by the survey are listed in Table 1.

A total of 141 farmers, comprising 66 from the Central and 75 from the Western Region responded to the questionnaire. Fig.1 is a comparison between level of Cape St. Paul Wilt Disease awareness amongst farmers and percentage of farmers practising some form of control on their farms, based on total number respondents.

**Discussion**

Reports of outbreak of the Cape St. Paul Wilt disease at places like Agona Junction and Tumantu (Ahanta West), Ndetiem (Nzema East), Anagye (Sekondi-Takoradi), Agyeikrom, Dabre, and Cape Coast (Central Region), which supposedly, were not affected during the last disease survey (Arkhurst, 1988), indicated that the disease fronts are still widening in the Western and Central Regions, from different infection foci.

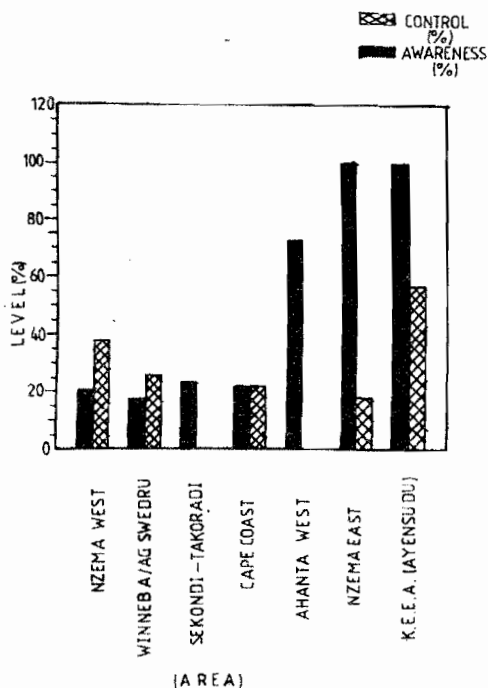


Figure 1

**TABLE 1**

*Record of farmers responding to the questionnaire on Cape St. Paul Wilt Disease*

Area	No of Respondents	Acreage of farm
<i>Western Region</i>		
Sekondi-Takoradi	22	91
Ahanta West	22	180
Nzema East	11	296
Nzema West	20	401
Sub Total	75	968
<i>Central Region</i>		
K.E.E.A	34	302
Cape Coast	9	68
Winneba and Agona Swedru	23	290
Sub Total	66	660
Grand Total	141	1,628

Table 2 indicated that level of awareness was highest in the devastated areas, ranging from 77-100%, and lowest in areas where the disease does not occur presently; with the level of awareness ranging from 17-20%. In areas where disease outbreaks recently occurred, the level of awareness rose from 22-23%, being slightly higher than those in the places, where the disease was still absent. The low level of disease awareness in some areas, as explained above, suggested that farmers get to know of the disease only after their farms have been affected, a

situation that does not augur well for effective disease control.

In areas where farmers' awareness of the disease was high (devastated areas), percentage of farmers attempting some form of control method on their farms was very low (K.E.E.A being an exception) whereas in areas where farmers' awareness of the disease was low (disease absent or outbreaks occurred recently), percentage of farmers attempting some form of control was high (Table 3).

**TABLE 2**  
*Record of Cape St. Paul Wilt Disease (CSPWD) awareness amongst farmers*

<i>Area</i>	<i>No. of Respondents</i>	<i>No. of CSPW awareness</i>	<i>Level of knowledge (%)</i>
<i>Devastated Zone</i>			
Ahanta	22	16	73
Nzema East	11	11	100
K.E.E.A	34	34	100
<i>New Disease outbreak foci</i>			
Sekondi-Takoradi	22	5	23
Cape Coast	9	2	22
<i>Unaffected Zones</i>			
Nzema West	20	4	20
Winneba & Agona Swedru	23	4	17

**TABLE 3**  
*Records of farmers practising some form of disease control on their farms*

<i>Area</i>	<i>No. of Respondents</i>	<i>No. attempting control</i>	<i>% Practising</i>
Ahanta West	22	0	0
Nzema East	11	2	18
K.E.E.A	34	19	57
Sekondi-Takoradi	22	0	0
Cape Coast	9	2	22
Nzema West	20	8	38
Winneba & Agona Swedru	23	6	26

For instance, the level of awareness of farmers in Nzema East and Ahanta West areas was 100% and 77% respectively, but the percentage attempting some form of control was 18% and 0% respectively. On the other hand, level of awareness of farmers in the Nzema West and Cape Coast was 20% and 22% respectively, but the percentage attempting some form of control was 38% and 22% respectively. There appears to be an inverse relationship between the level of awareness of farmers about the disease and the percentage of farmers practicing some form of control on their farms (Fig.1).

Obviously, the form of control methods attempted by farmers cannot check the spread of the disease. Apparently, only trees showing advanced symptoms or those already dead, were destroyed. Contact trees that remain may serve as source of inoculum. Also, infective vectors may be available to attack healthy trees and thus spread the disease. Perhaps in areas already devastated by the disease (where level of awareness was high), farmers learnt of the futility of their control attempts and thus stopped doing anything altogether.

From all indications, respondents classified as being aware of the disease, only knew of the existence of the disease and some of its symptoms, but knew nothing about the control method involving "hot fogging" and cutting out of infected and contact trees; of which early successful detection of Cape St. Paul Wilt attack and its appropriate control methods, should therefore, be the first point of focus in any extension services on coconut in the country. It is therefore heartening that all 141 respondents expressed their willingness to co-operate with scientists to find solutions to the Cape St. Paul Wilt menace.

### Acknowledgement

We wish to thank the Director, Extension Services, Ministry of Agriculture, Head Office, Accra, for permitting his field officers to do the circulation of the questionnaire for us. We also thank the Director, Oil Palm Research Institute, Kusi for approval to present this paper.

### References

- ARKHURST, E.D. (1988) Constructive approach towards solving the Cape St. Paul Wilt Disease problem of coconut in Ghana. France-Ghana-Cote d'Ivoire Coconut Rehabilitation Project.
- BURKILL, J.H. (1966) A Dictionary of the Economic products of the Malay Peninsular. 2nd Ed. Kuala Lumpur, MOA.
- CHONA, B.L AND ADDO, P.G (1970) Cape St Paul Wilt: The present position. In Coconut in Ghana. Ed. Bl. Chona and M.A. Adansi; Bulletin No.3 CRI, CSIR, Ghana.
- HOWARD, F.W., NORRIS, R.C. & THOMAS, D.L. (1983) Evidence of transmission of palm Lethal Yellowing agent by a plant hopper, *Myndus crudus* (Homoptera: Cixiidae). Trop. Agric (Trinidad).
- HUNT, P., DABEK, A.J. & SCHULING, M. (1974) Remission of symptoms following tetracycline treatment of lethal yellowing infected coconut palms. *Phytopath.* **64**, 307-312.
- IDA (1989-1990) IDA Fund for the Improvement of the Coconut Industry (Control of the Cape St. Paul Wilt Disease): Working programme 1989-1990.
- MARAMOROSCH, K. (1964) A survey of coconut diseases of unknown etiology. Rome: FAO
- PLAVSIC-BANKAC, B., HUNT, P. & MARAMOROSCH, K. (1972) Mycoplasma-like bodies associated with lethal yellow disease of coconut palms. *Phytopath.* **62**, 298-299.
- PURSEGLOVE, J.W. (1972) Tropical crops: Monocots. English Lang Gk. Soc/Longman, pp. 440-441.
- TYPMON, A., JONES, P. & EDEN-GREEN, S. (1993) Detection and discrimination of mycoplasma-like-organisms (MLOs) associated with coconut lethal yellowing and other diseases. Final Tech. Rep. NRI, proj. No. A0282. Jnl. 5, 1992 - February 4 1993.