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ASEAN PLANT QUARANTINE CENTRE AND TRAINING INSTITUTE

LETHAL YELLOWING

Other names

Awka disease (Nigeria), bronze leaf wilt (Jamaica), Cape St. Paul wilt (Ghana), Kaincope disease (Togo), Kribi disease (Cameroon Republic), pudricion del cogollo (Cuba), pourriture du bourgeon terminal (Haiti)

Principal host

Coconut (*Cocos nucifera*)

Other hosts

Arikury palm (*Arikuryroba schizophylla*), Palmyra palm (*Borassus flabellifer*), Cluster fish-tail palm (*Caryota mitis*), Cabada palm (*Chrysalidocarpus cabadae*), Gebang palm (*Corypha elata*), Princess palm (*Dictyosperma album*), Puerto Rican gaussia palm (*Gaussia attenuata*), Belmore sentry palm (*Howea balmoreana*), Spindle palm (*Hyophorbe verschaffeltii*), Latan palm (*Latania* spp.), Chinese fan palm (*Livistona chinensis*), Mazeri palm (*Nannorrhops ritchiana*), *Neodypsis decaryi*, Canary Island date palm (*Phoenix canariensis*), Date palm (*P. dactylifera*), Senegal date palm (*P. reclinata*), Wild date palm (*P. sylvestris*), Kona palm (*Pritchardia affinis*), Fiji fan palm (*P. pacifica*), *P. remota*, Thurston palm (*P. thurstonii*), *Pritchardia* spp., *Ravenia hildebrandtii*, Windmill palm (*Trachycarpus fortunei*), Manila palm, Christmas palm (*Veitchia merrillii*), *V. montgomeryana*, *V. arecina*, Sunshine palm (*Veitchia* spp.)

Geographical distribution

Africa (Cameroon, Ghana, Nigeria, Togo and possibly Tanzania), USA (Florida, Texas), Mexico, Central America, West Indies (Cayman Island, Bahamas, Cuba, Dominican Republic, Haiti, Jamaica).

Causal agent

Mycoplasma - like organism.

Coconut palm plantations with susceptible varieties can be devastated by lethal yellowing. The first symptom of lethal yellowing in mature coconut palms is the premature dropping of most of the coconuts regardless of size. Most of the fallen nuts will have a brown water-soaked area immediately under the calyx at the stem end.

The next symptom to develop is the blackening of new inflorescences (Fig. 1) as they break through the spathe. Most of the male flowers will be dead on the blackened inflorescences, and no fruit will set on such flower stalks. Leaf discoloration follows, beginning with older leaves and spreading rapidly to younger ones (Fig. 2). The foliage turns light yellow and eventually orange-yellow. This symptom coincides with the death of root tips. The youngest leaves next to the buds show water-soaked streaks which spread until there is a terminal rot of the growing point (Fig. 3). Death occurs in coconut palms about four months after the initial symptoms appear.

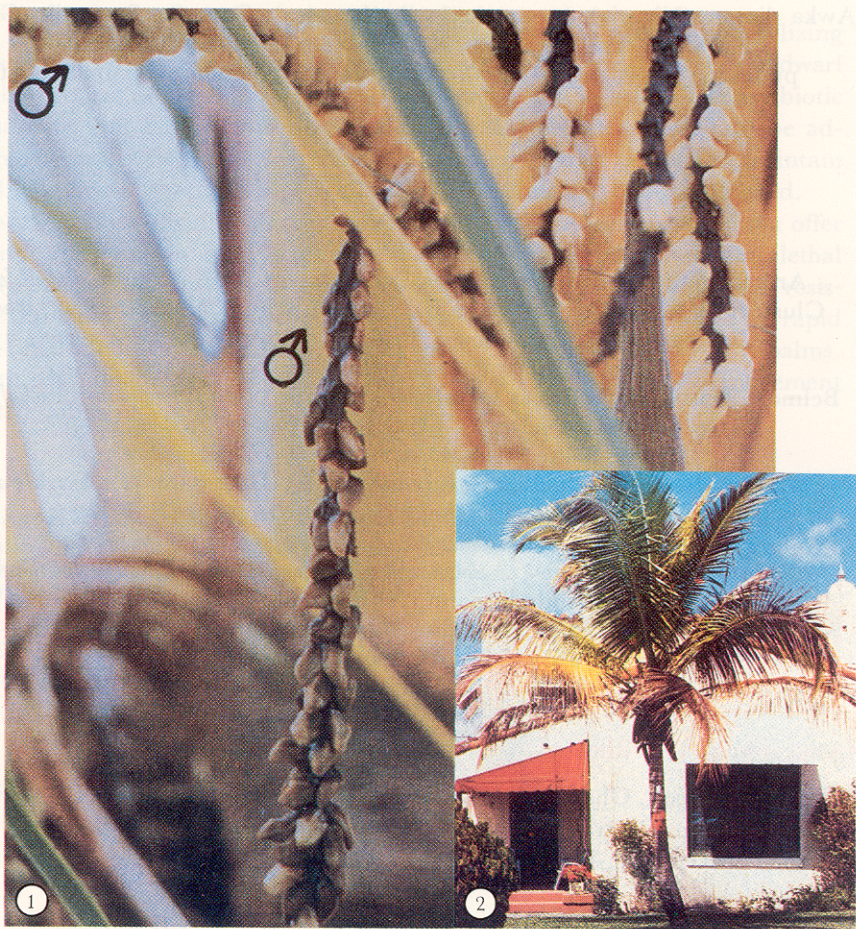


Fig. 1. Coconut inflorescence showing necrosis and retention of dead male flowers, an early symptom of lethal yellowing.

Fig. 2. Yellowing in lower leaves.

Transmission

Introduction of the planthopper *Myndus crudus* Van D., from an infected area onto caged susceptible palms over a period resulted in the development of symptoms (2). Plants in protected cages remained healthy.

The pathogen

Mycoplasma-like particles have been found in the sieve-tube elements of the phloem of coconuts and other palms exhibiting characteristic symptoms (Fig. 4).

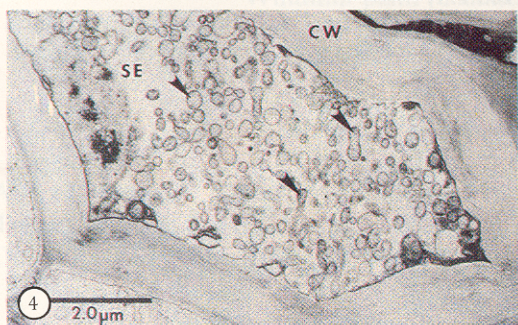


Fig. 3. Collapse and necrosis of spear leaf.

Fig. 4. Electron micrograph of a sieve tube element (SE) from a young leaf base infected with mycoplasma-like organisms (arrows).

Economic importance

Lethal yellowing destroys coconut production wherever it occurs. In Jamaica, more than 90% of 'Jamaica Tall' coconut palms were killed.

Potential within ASEAN

There is great risk of introducing lethal yellowing to palm trees worldwide. Infected vegetative plant material, including ornamental species could provide the means of entry. Movement of ornamental palms from infected areas is hazardous to date-growing countries as well as the movement of date palms. Its possible introduction to ornamental palms and in germplasm collections of palms under glass in botanic gardens poses a threat to non-infected areas.

An accidental introduction of palm lethal yellowing mycoplasma into the ASEAN could extend its range to coconuts and other palms in the Region.

Control

Control of lethal yellowing is possible through an integrated programme utilizing the measures of resistance, protection, eradication and quarantine (3). Malayan dwarf is notably resistant as are Malayan Dwarf X Panama Tall hybrids. The antibiotic oxytetracycline can bring about a remission of lethal yellowing and may be administered protectively to healthy palms. Chemotherapy may be used to maintain susceptible palms in the landscape while resistant palms are being cultivated.

In view of the difficulties of diagnosis, pre-export certification would not offer adequate protection. No living palms or palm seeds should be moved from lethal yellowing-infested areas to date palm-growing areas or countries. Host plant resistance is ultimately the best means for dealing with lethal yellowing. The rapid removal of affected palms slows down the apparent rate of spread to healthy palms. Quarantine is a regulatory measure designed to prevent the inadvertent movement of infected palms or vectors to disease-free areas.

REFERENCES

1. Anonymous (1986). Palm lethal yellowing mycoplasma No. 159. *EPPO Bulletin* 16: 61-65.
2. Howard, F.W., R.C. Norris and P.L. Thomas (1983). Evidence of transmission of palm lethal yellowing agent by a planthopper *Myndus crudus* Van D. (Homoptera: Cixiidae). *Tropical Agriculture (Trinidad)* 60: 168-171.
3. McCoy, R.E. (1983). Lethal yellowing of palms. Bulletin 834. Published by Agricultural Experiment Stations, Institute of Food and Agricultural Sciences, University of Florida, Gainesville. 100 pp.

Compiled by
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Photos through the courtesy of Agricultural Experiment Stations, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, U.S.

Published by

ASEAN PLANT QUARANTINE CENTRE AND TRAINING INSTITUTE
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Malaysia
1989