Root (wilt) disease of coconut - economically viable and easy to practice integrated management

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RWD, a debilitating malady affecting palms of all age groups growing in different soil types, now occurs in a contiguous manner in the 8 southern districts of Kerala State.

Root (wilt) and leaf rot affected coconut palm

Root (wilt) disease (RWD) of coconut was first noticed in the erstwhile State of Travancore around 1874 and became very much evident in 1882. RWD, a debilitating malady affecting palms of all age groups growing in different soil types, now occurs in a contiguous manner in the 8 southern districts of Kerala State. It is also noticed in isolated pockets in the remaining six northern districts of the State and in the districts of Tamil Nadu and Karnataka adjoining to Kerala State. Recently the disease has also been recorded from Goa. The annual crop loss due to the disease in Kerala was estimated as 968 million coconuts. The disease causes considerable crop losses in Cumbum valley, Shenkottai, Kulasekharam and Pollachi in Tamil Nadu.

The most obvious and diagnostic symptom of the disease is the abnormal inward bending of the leaflets termed ribbing or flaccidity. Yellowing and marginal microsis of leaflets are the other associated foliar symptoms. Rotting of roots increases with the progress of the disease. Shedding of immature nuts, drying up of spathes and necrosis of spikelets in unopened inflorescence are noticed in certain cases. The husk, kernel and oil of the nuts of the disease affected palms are of poor quality. The disease also causes several internal changes in the palm.

Concerted and intensive research carried out at the Central Plantation Crops Research Institute (CPCRI) has resulted in the identification of a Phloem bound mollicute - phytoplasma as the cause of the disease. Constant association of phytoplasma with the disease has been established. ELISA test has been developed at the CPCRI for the early diagnosis of this disease. The disease affected palms can be detected even 24 months before the expression of symptoms. This test is being used extensively in the identification of healthy elite mother palms, screening of the progenies of elite palms, screening nursery seedlings and for confirmation of RWD in new areas of incidence.

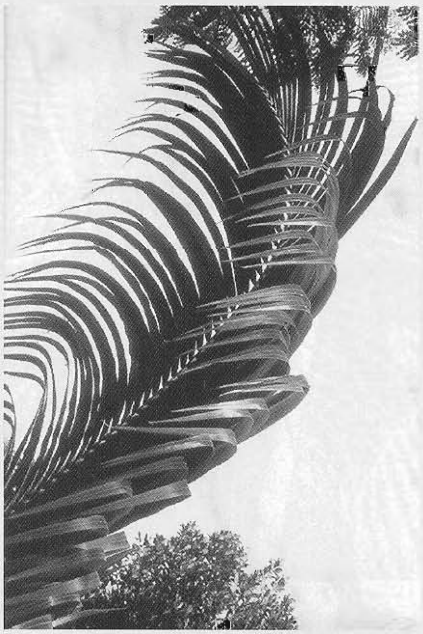
Leaf rot, caused by fungi mainly *Exerohilum rostratum* and *Colletotrichum gloeosporioides*, occurs superimposed on root (wilt) affected palms. Leaf rot causes reduction in photosynthetic area, disfiguration of the palms and reduction in yield apart from attracting a number of insects that feed, multiply and cause further

damage. Normally farmers identify a palm as root (wilt) affected only when leaf rot sets in.

Disease management strategies

Since the disease is caused by phytoplasma it is not amenable to conventional plant protection measures. One of the significant features of the disease is that it is not lethal but a debilitating malady which responds to ideal management practices. Two strategies, one for the heavily diseased contiguous area, and another for the mildly affected area have been formulated. In the heavily diseased area, the yield of palms can be sustained or even improved through adoption of integrated management practices like removal of disease advanced palms, balanced fertilizer application, addition of organic manures, raising of green manure crops in the basins and incorporation, irrigation during summer months, practicing plant protection methods and adopting inter and mixed cropping. Mixed farming in the diseased gardens involving the raising of fodder crops in the inter spaces, maintaining milch cows and recycling of organic waste has helped in increasing the yield of palms.

The loss can be reduced to the minimum if palms could be attended immediately on appearance of symptoms and prophylactic and curative treatment for leaf rot is given to all palms in the disease prevalent areas twice a year. Management of leaf rot is very important in addition to irrigation and recommended dose of fertilizers and manures for the effective management of root (wilt) disease



Flaccidity - the diagnostic and initial symptom of root (wilt) disease

of coconut in heavily disease affected area.

Leaf rot being a major component in the root (wilt) disease complex contributing to rapid decline and reduction in yield, CPCRI has developed a very effective, easy to practice, labour saving and economically viable integrated management practice for the management of leaf rot disease and major pests occurring in heavily root (wilt) disease affected tracts.

- Cut and remove rotten portions of the spindle and the adjacent two innermost fully opened leaves, if affected by leaf rot. White soft leaflets of the spindle alone are susceptible to fungal attack. Therefore, older leaves that had leaf rot disease earlier need not be removed.
- Mix Contaf 5 EC (Hexaconazole) 2 ml or Indofil M-45 (Mancozeb) 3 g in 300 ml water and pour around the base of the spindle leaf.
- Apply 20g Phorate 10G or 30g Furadan 3G mixed with 200g sand around the base of the spindle leaf.
- Treat all palms in the garden (healthy and diseased) twice a year, i.e. in April-May and October-November. To make this operation more economical the treatment should be given along with harvest of nuts before and after south - west monsoon.

Management of leaf rot disease of coocnut

Residue analysis done for the chemicals in mature and tender nuts showed that the nut water, kernel, coconut oil and coconut cake are free from residues after 45 days of application at the rates suggested above.

The strategy for mildly affected area is to contain the disease by removing all the diseased palms. Eradication of disease-affected palms to contain the disease can be successful if continuous monitoring for occurrence of the disease and uprooting of diseased palms in the very initial stage of the disease are taken up simultaneously. If the programme is not monitored uninterruptedly the desired goal will not be achieved.

Coconut palms after treatment for leaf rot disease

Breeding for disease resistance

As there are no prophylactic or curative measures for treating the diseased palms, the ultimate practical solution for managing the disease is generating disease resistant / tolerant progenies. Based on the field survey conducted in hot spots of the heavily diseased tracts, a number of West Coast Tall and Chowghat Green Dwarf disease free high yielding elite palms have been identified. These palms are being used for generating disease resistant/ tolerant progenies.

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