COCONUT ROOT WILT MANAGEMENT: FOCUS TURNS TO IN-VITRO CULTURE

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The root wilt disease became significantly manifested after the 1882 floods at Erattupettah in Kottayam district of Kerala. The disease causes an annual loss of over 1000 million nuts, 26% loss of husk, 9% loss of copra and 11.3% loss of oil per nut and 60% loss of leaves per palm at present. Thus, about Rs. 500 crores is lost annually due to the incidence of coconut root wilt disease.

Recent studies revealed that mycoplasma like organisms (MLO) are the causal agents of the disease. The lace bug (*Stephanitis typicus*) is considered to transmit the disease. Mycoplasma like organisms from the diseased palms have been transmitted through a vegetative vector, dodder (*Cassytha filiformis*) to a mycoplasmal indicator plant, periwinkle (*Catherunthus roseus*) and from periwinkle to periwinkle.

Clonal plantlets of coconut have been produced by culturing spindle leaf tissues from one to two year old seedlings through somatic embryogenesis bypassing the callus phase. Activated charcoal was incorporated into the R medium to avoid chemical killing of the explants.

Y3 mineral medium was found to be better for the growth of coconut embryos supplemented with Kinetin, NAA etc. Thus healthy seedlings with vigorous rooting of West Coast Tall variety and TxD hybrid coconut were produced by the in-vitro culture technique.

Histological studies showed the origin of embryoid to be directly from the vascular tissues. The plant initiation time could be brought down to three weeks by adjusting mineral and hormone levels in the medium. The embryoids got separated from the parent leaf segment after 6-8 weeks and could be made to sprout and develop into plantlets. From the time of collecting the tissue plantlets of 6-8 cm height, roots could be produced in 6-8 months.

Plantlets with good shoot-root ratio were transferred to a mixture of sand and vermiculite moistened with Hoagland's solution. 60% plants established were transferred to the field and are found to grow well.

Tender leaflets from coconut trees showing root wilt symptoms were already employed in in-vitro culture work. Slight expansion and development of chlorophyll in the explants were observed. Cultures of test periwinkles and dodder laurel were also initiated. About 50% of embryos from root wilt disease affected coconuts germinated in culture and some are indifferent stages of growth. Attempts were made to initiate primary cell cultures using infective lace bug.

The future thrust on root wilt research is on the identification of a resistant cultivar. The resistance may be against the pathogen or its vector. Vigorous attempts will also have to be made to culture coconut root-wilt pathogen. The already available technology of in-vitro culture of coconut will be made use of for the in-vitro screening for locating resistant lines.

When once the culturing of mycoplasma like organisms is achieved, in-vitro screening for resistance to this pathogen will be the immediate future strategy so as to identify resistant genotypes and thereafter their multiplication through in-vitro culture as a practical solution to the root wilt disease of coconut. In-vitro mutagenesis can also be utilised to obtain resistant plants.

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