

BREEDING MATERIALS FOR DISEASE RESISTANCE IN OIL PALM – CURRENT STATUS

Rajanaidu,N., Kushairi,A., Din,A., Noh,A., Norziha,A and Ainul,M

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ABSTRACT

Palm oil is the major vegetable to feed the world. Indonesia and Malaysia contribute nearly 90% of world's production. Both these countries are in South East Asia (SEA). Basal stem rot (BSR) caused by *Ganoderma boninense* is a major devastating oil palm disease in SEA. Similarly, vascular wilt by *Fusarium oxysporum* f.sp.*Elaeidis* has hampered oil palm development in Africa. Bud - rot complex limits the growth of oil palm plantations in Central/South America. The likely causal agent is *Phytophthora palmivora*.

CIRAD, London Sumatra, IOPRI and MPOB developed screening technique to identify oil palm progenies partially resistant to *Ganoderma*. These organizations used pre-cultured rubber wood block (RWB) with *Ganoderma* mycelium. The screening was carried out under shade using either germinated seeds or seedlings. There was high correlation between tolerant materials identified in the nursery screening and their performance in the field. Breton (2010) showed that AVROS breeding lines are generally more tolerant than Deli duras. Similarly it has been shown that LM 2 T self with BB 206 D self, LM 404 D x DA 10 D, DA 5 D x DA 3 D and DA 115 D self crosses are tolerant to *Ganoderma* when expressed as "Wilt Index". Rahmaningsih et al.(2010) computed the general combining ability (GCA) values for Deli duras and pisiferas and specific combining ability (SCA) which is the interaction between dura and pisifera. Their contribution to the total variation is low, but a wider range of germplasm, may enhance their contribution. We recommend the use of incomplete NCM 11 breeding design with connected crosses to estimate the GCA values of dura, pisiferas and their interaction to estimate specific combining ability (SCA). With this mating design, it is possible to identify and quantify the contribution made by the individual parent towards the disease tolerant materials.

In the case of *Fusarium*, by planting resistant materials, the disease losses were brought down from 20-30% to less than 3 % in Ivory Coast (deFrangueville & Renard, 1990). In the screening process, each cross consisted of 160 seedlings (8 replicates of 20 seedlings) and the results were obtained 5 months after inoculation. The nursery results correlated with field observation. The tolerant level in the progenies is expressed as " Vascular Wilt

Index". In the Binga breeding programme, MAB 69 and Rosenguist (1986) Malaysian Dumpy Deli were identified to be resistant to Fusarium. At Pamol Cameroon Ekona 2/2311 is being used extensively to produce Fusarium tolerant planting materials. However the Ekona breeding line 2/5710 is highly susceptible to Fusarium. In CEREPAH La Dibamba, Cameroon, D II5 D self and LM2T genotypes are used to produce commercial DXP planting materials tolerant to Fusarium.

Oil palm plantations were devastated by spear rot in the Tumaco region of Colombia. Only inter-specific hybrids survive in this region. Dr Martinez of Cinopalma attributed the disease to the causal agent *Phytophthora palmivora*. There are a number of *E.oleifera* populations available to produce inter specific hybrid seeds. The first *E.oleifera* of commercial interest was based on Brazilian Coari population. At present INDUPALMA and La Cabana in Colombia use Coari for hybrid seed production. The Embrapa Research Station at URUBU Manaus in Brazil has an extensive *E.oleifera* collection. The Manicore population was outstanding and the hybrids were evaluated in Palmar del Rio, Ecuador with promising results. The other lines of interest are ASD Amazon genotype which has 53% *E.oleifera* blood and the Taisha oleiferas collected in Ecuador. The Taisha oleiferas are crossed with AVROS pisiferas to produce high yielding hybrids with an extraction rate comparable to guineensis. The main disadvantages of hybrids are the need for assisted pollination, low % seed germination and unpredictable production of androgynous inflorescences.

The oil palm industry has to give priority for breeding planting materials for disease tolerance so that it is possible reduce the cost of controlling the diseases using chemicals and expensive cultural methods.

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