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Advancement in Oil Palm Planting Materials in the Future*

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The development of shorter planting materials based on MPOB Nigerian population 12 and E.oleifera x E.guineensis inter-specific hybrids is highlighted in this paper. The progeny test results of Nigerian Population 12 with selected Deli duras showed that the DxP oil yield ranges from 8.1-8.5 tonnes per hectare per year. The height increment of DxP is 33-39 cm per year. In comparison, the height increment of Deli x AVROS is about 60 cm per annum.

In Colombia where DxP commercial plantations are devastated by bud rot disease, Cinopalma demonstrated that application of naphthalene acetic acid (NAA) increased the oil yield of inter-specific hybrids which are tolerant to the disease. It was demonstrated in commercial plantations that applying NAA can produce more than 40 tonnes fresh fruit bunch (FFB) per hectare per year, with an extraction rate of about 27 per cent giving >10 tonnes oleic oil per hectare.

The tissue culture labs in Kuala Lumpur-Kepong (KLK) and Asian Agri are also cloning their elite Deli duras and pisiferas to create semi- and bi- seeds. Applied Agricultural Resources (AAR) is the largest semi-clonal seed producer in Malaysia, and produces about 8 million per year and sells the seeds at a premium.

A number of plantation companies in Malaysia and Indonesia have initiated programmes to produce Ganoderma tolerant planting material. Companies have adopted an integrated disease management (IDM) approach, covering land preparation, planting tolerant varieties, use bioagents, early detection, and removal of infected materials. Asian Agri AA TOPAZ GT variety, partially tolerant to Ganoderma, has an average oil yield potential of 9.2 tonnes crude palm oil (CPO) per hectare per year.

Digitalisation refers to the process of integrating advanced digital technologies such as artificial intelligence (AI), big data, robotics, unmanned aerial vehicle (UAV), sensors, and communication networks, all connected through Internet of Things (IoT) into farm production system.

A major breakthrough was achieved by the oil palm Genome Programme at the Malaysian Palm Oil Board (MPOB), where the identification of the gene controlling Shell has made it possible to identify and differentiate dura, tenera and pisifera at the nursery stage. This led to the first molecular diagnostic assay known as SureSawit™ SHELL, which the breeders can use to identify and isolate dura, tenera and pisifera seedlings from TxT and TxP breeding crosses. The kit can be used for identification of dura and pisifera contaminants in the nursery and more recently at the seed production facility.

The planter has an important role to help realise the full potential of planting materials. The planter's role starts from receipt of germinated seeds to field planting. The planter is assigned to monitor ripeness standard, harvesting, loose fruit collection and managing of workers, all of which are major tasks to ensure productivity.

Climate change is real and we have to confront drought and floods more frequently. In order to minimise the impact of drought, it is advisable to plant planting materials with high bunch number. MPOB has collected oil palm germplasm in the dry areas of Nigeria. This germplasm has attributes such as high bunch number, low bunch weight and high chlorophyll content in the leaves. These traits are useful to develop drought tolerant planting materials.

Keywords: MPOB Nigerian Population 12, interspecific hybrids, tissue culture ramets, Ganoderma tolerant, digitalisation, oil palm genome, climate change.