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Breeding for High Oil Yielding Tenera Palms*

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The family and individual selection (FIS) breeding programmes of Deli Durans can either be genetically disassortative mating system to create genetic variability within the germplasm or genetically assortative to maintain inbred lines through selfing, full or half sibling mating. IOI 's first generation inbred line durans Pkg 119 or D24 of Klanang Bharu origin planted as part of the first cycle (C₁) of the limited breeding programme (LBP) have desirable traits such as high bunch number, thick fruit mesocarp, high mesocarp oil and thin shell, nevertheless, showed inbreeding depression characterised by low bunch weight due to poor fertility. When the Pkg 119 inbred lines were hybridised with AVROS and Ekona pisiferas, the resultant tenera progenies showed marginally high total oil yield with high percentage of fruit set as in DP5, DP6, DP10 and DP11 trials. When D24 or Pkg 119 was subjected to repeated self-fertilisation for the development of the second cycle (C₂) limited breeding programme, further inbreeding depression was observed characterised by low yields and low fruit set in the dura progenies. However, such durans have the potential to develop tenera hybrids through heterosis breeding and it should be verified by progeny testing.

The durans of C₂ LBP were also developed through half sib crosses and the tenera progenies developed is being tested in DP22 trial. The durans of half sibs crossed with AVROS pisifera generally showed comparable yield with tenera progenies developed from DxD of different families. Inbreeding depression was not observed in the half sib dura palms. Most of the teneras developed from C₂ LBP were commercially planted from 1999 and yielded fresh fruit bunch (FFB) ranging from 25 t to 31.00 t in the seventh year after planting depending on the type of the soil. The oil extraction rates (OER) had commercially increased due to the contribution of the teneras developed from both C₁ and C₂ LBP materials.

Keywords: Oil palm breeding, inbreeding coefficient, heterozygosity, progeny testing.