

Genomics guided breeding for oil palm improvement

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Systematic progress made via conventional breeding has allowed yield gains for oil palm, and made the oil palm industry commercially viable in South East Asia, particularly Malaysia and Indonesia. However, its long selection cycle and large land requirement for breeding trials has made subsequent progress slow and tedious. Genomics guided breeding is an attractive option to help this crop meet its true potential. However, the development of appropriate tools, such molecular marker systems and identification of markers and or gene(s) linked to traits of interest has been generally slow. The effort received a boost when its genome was sequenced in 2013 using a combination of 454/Roche technology and BAC end sequencing. The availability of the sequence assembly and a well-structured breeding programme allowed the identification of genes influencing two important monogenic traits, which was a major breakthrough for this perennial crop. The subsequent development of the first molecular diagnostic assay, the SureSawit™ Shell kit has allowed marker assisted selection (MAS) to be a reality for oil palm. Building on this success, the epigenome of oil palm was also unraveled in order to examine DNA methylation alterations in clonal palms. Deciphering of the epigenome and understanding the causes of clonal abnormality has also made large scale tissue culture of oil palm feasible.

Biography

Rajinder Singh is currently a Principal Research Officer at the Malaysian Palm Oil Board. He has been with the Malaysian Palm Oil Board for the last 19 years. He holds a PhD in Plant Genetics and is currently the Head of Genomics Unit of the Advanced Biotechnology & Breeding Centre, at the Malaysian Palm Oil Board (MPOB). He has authored and co-authored more than 32 refereed publications.

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