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Sequencing for Super Seeds

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The year 2000 marked two important milestones in the science of whole genome sequencing (WGS): completion of the draft human genome and that of Arabidopsis, a model plant commonly used for research. Since then WGS has gained prominence as a foundation for plant improvement. Much of this is due to rapid advances in the development in DNA sequencing technology. ACGT Sdn Bhd, is the first in the world to announce the completion of the sequencing of the oil palm genome in May 2008. ACGT's goal in this endeavour is to use the knowledge embedded in the genome to improve oil palm yield. Towards this end, we have applied the data from WGS to the development of markers for oil palm improvement. In-house sequencing facilities comprising both Sanger and the Next Generation sequencing technology and bioinformatics pipelines have been established at ACGT's Next Generation Laboratory, fondly called ANGeL, to enable high throughput end-to-end marker applications from sequencing to marker mining and genotyping. The markers mined from the genome have been tagged to traits of interest and applied to our oil palm breeding programme. As this process of marker-assisted selection is both precise and efficient, the company envisages creating improved materials or "super seeds" in a shorter timeframe.

Keywords: Whole genome sequencing, plant genome, DNA marker, genotyping-by-sequencing, trait gene association, marker-assisted selection, marker-assisted breeding and high yielding oil palm seeds.

