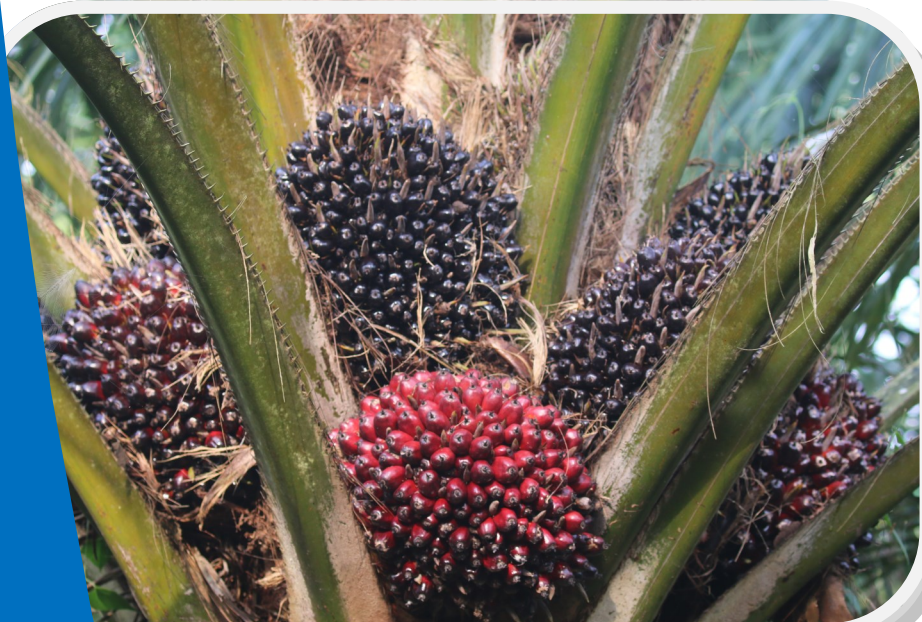




IOI GROUP

*IOI Deli x AVROS Hybrid Seeds -
a Smarter Choice to Sustain Production & Profitability*



Proven Pedigree,

High Performance &

Assured Quality

www.ioigroup.com

PROVEN PEDIGREE - History of IOI Breeding Programme

IOI Deli Dura

The lineage of IOI Deli Dura population can be traced back to 1965, where oil palm parent materials of “Limited Breeding Programme” (LBP) derived from Oil Palm Genetics Laboratory (OPGL) were shared to Pamol and Dunlop with the intention of producing future planting materials (Donough and Chia, 2005). The duras from the LBP performed well as excellent parent materials through several cycles of selection for phenotypic characters such as thick mesocarp, thin shell, higher oil to mesocarp and larger fruits, these characters are used for the production of high oil yielding planting materials (Mathews *et al*, 2007).

Another early exchange programme was the Sabah Breeding Programme (SBP), organised by the Department of Agriculture, (DOA) Sabah in 1960, which includes the exchange of Deli Dura from various sources (Corley and Tinker, 2016). These palms were planted in Pamol Sabah and Kluang Estates. Rajanaidu (1986) mentioned that this programme contains valuable breeding materials.

IOI AVROS

The pedigree of IOI AVROS material can be traced back to the original selections in Sungai Pancur, Indonesia. These pisifera materials are the 3rd cycle derivatives from BM119. Aside from pure MPOB AVROS material, IOI through Pamol obtained Dami OPRS proven AVROS through Combined Breeding Programme (CBP) (Donough and Chia, 2005). Yet another AVROS material from DOA of Sabah acquired through PORIM (now MPOB) were crossed with Dami AVROS pollen. These introgression of MPOB/Ulu Dusun - Dami breeding programmes initiated from 2001 has proven and performed superior in many progenies tested trials and commercial plantings.

IOI Deli x AVROS

Currently, the proven planting material derived from 2nd cycle Deli Dura (SBP and LBP) and IOI MPOB/Ulu Dusun-DAMI AVROS pisifera are now being commercially produced and known as IOI Deli x AVROS.

CORLEY, R., & TINKER, P. (2016). The oil palm, 5th Edition. Blackwell Publishing Ltd, Hoboken. 151.

DONOUGH, C., R., & CHIA, C. (2005). Breeding oil palms for high oil yield DXP in IOI Group 1. First cycle of development of OPGL-derived materials. Unedited preprints Advances in breeding and clonal technologies for super yielding planting materials, Malaysian Palm Oil Board National Seminar, 7-8 March 2005, Seri Kembangan, Selangor.

MATHEWS, J., TEO, K. W. & IP, W. M. (2007). Breeding for High Oil Yielding Tenera Palms. 6th ISP National Seminar 2007.



PROVEN PEDIGREE - Deli Dura & AVROS Pisifera Lineages In IOI Group

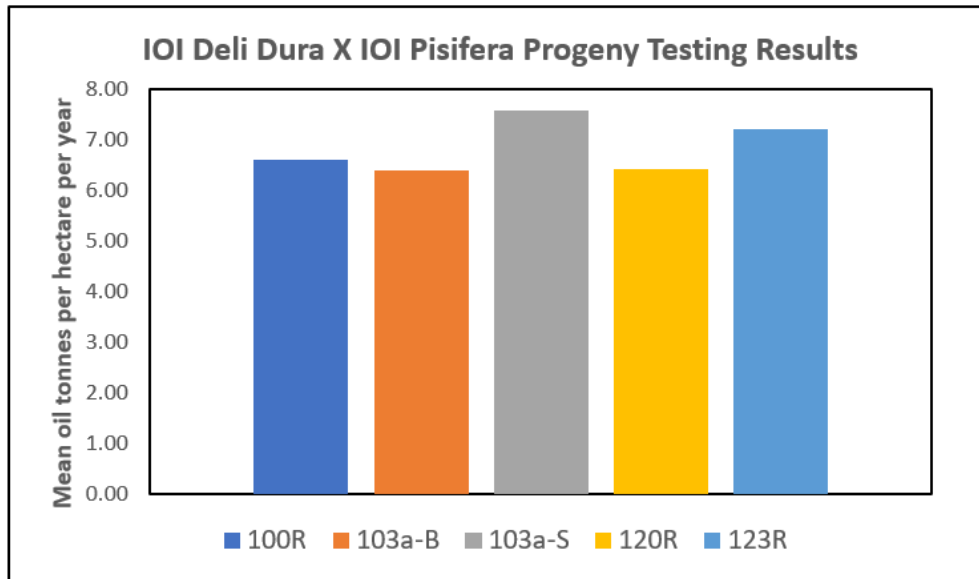
IOI Deli Dura-Cycles of Breeding

Breeding Cycle	IOI OPGL Deli Dura			IOI SBT Deli Dura	Clonal Deli Dura		
1	1974	PBT74/1-3	O/10-1/PL				
2	1990	DD2A	O/10-12/G		2008	O/10-106G	
	1991	DD2B			2009	CT40	O/10-117/R
	1992		O/10-22/G		2014		O/10-136/R
	1993		O/10-28/PL		2016		O/10-136(ii)/R
	1994	DD2C					
	1996	DD2D	OPB/LP2 MP01				
	1997	DD2E/DD2F					
	1998	O/10-37/R	O/10-3S/LP				
	2000			DD2G-I			
	2001			DD2H			
	2002			DD2G- II			
3	2009	O/10-112/R					
	2010	DD3B	O/10-113/PL				
	2012	O/10-128/G	O/10-132/PL				
	2013	DD3D					
	2015	DD3C					
	2016	DD3E					

IOI AVROS-Cycles of Breeding

Breeding Cycle	AVROS Improvement Programme			Clonal AVROS	Embryo Rescue AVROS		
1	1991	O/10-15/G		2011	O/10-131/RC		
	2000	TP3 AVROS			O/10-129/G		
	2001	TP1 AVROS					
	2003	TP2 AVROS					
2	1996	O/10-1S/LP2			2016		O/10-137a/R
	1999	O/10-41/R	O/10-4S/LP2		2017		O/10-137b/R
	2011	O/10-129/G					
3	2009	O/10-108/R	O/10-109/R				
	2011	TP4 AVROS					

PROVEN PEDIGREE - Progeny Testings



100R- 2006 Plantings 15G MPOB AVROS (Mean of 6 years data)

103a-B 2008 Plantings TP2 Pamol Kluang AVROS (Mean of 6 years data)

103a-S 2008 Plantings TP2 Pamol Kluang AVROS (Mean of 5 years data)

120R 2009 Plantings TP2 Pamol Kluang AVROS (Mean of 4 years data)

123R 2009 Plantings Ulu Dusun AVROS (Mean of 5 years data)

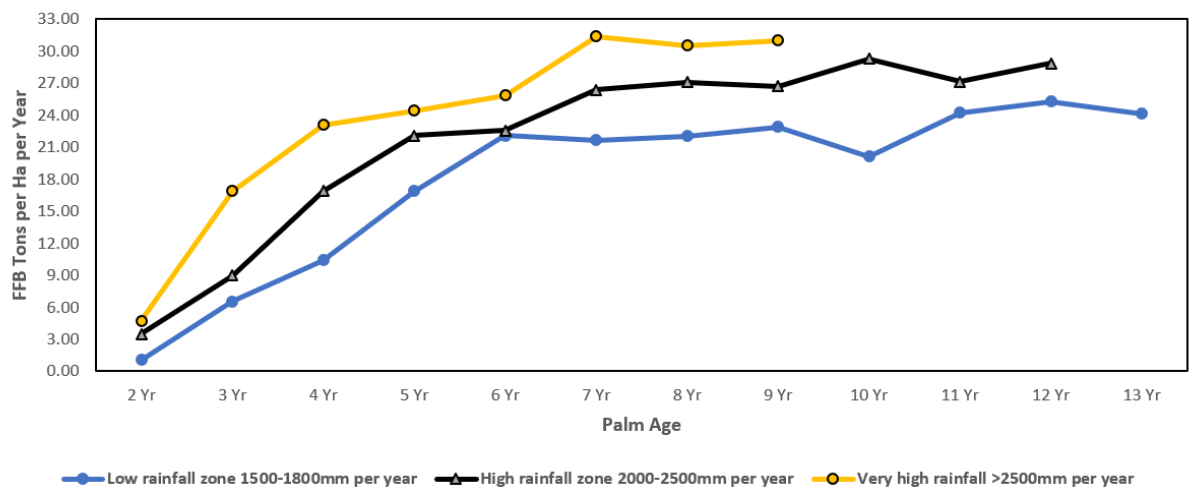
Medium-sized with high bunch numbers and relatively narrow petiole are among the distinctive characteristic of IOI Deli Dura x AVROS planting materials.



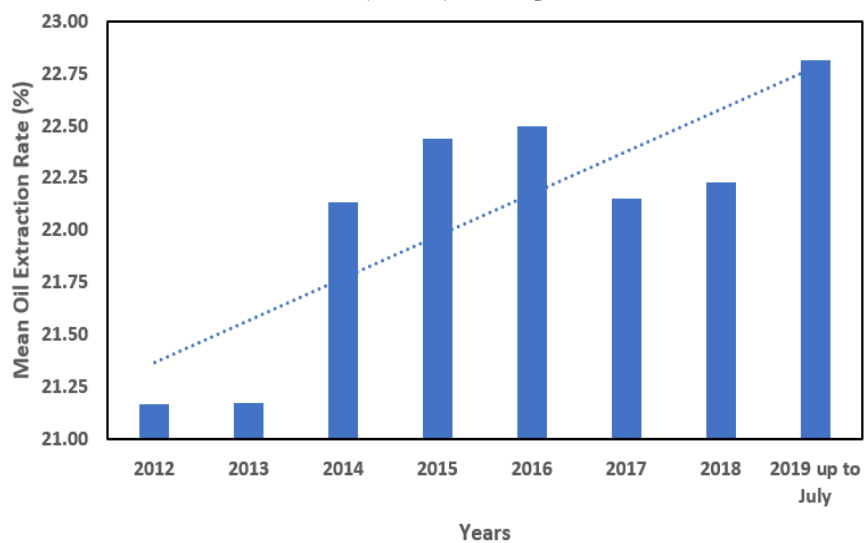
Unrivalled reputation for high oil extraction rate (OER)

HIGH PERFORMANCE in FFB & Oil Production

IOI DXP Planting Material Performance on Annual FFB Production in Commercial Plantings of 3 Rainfall Zones



Progressive Annual Commercial OER% Increment in 4 IOI Oil Mills Supplied with FFB from Replants of LBP2 (Dura) Crossed with IOI AVROS (Pisifera) Planting Material



Precocious yields — Young palms of IOI planting materials.



Progressive improvement of OER in IOI oil mills through replanting of advanced planting materials.

ASSURED QUALITY - Selection, Production to Germination

- Quality Control (QC) is the highest priority right from the selection of parent palms through the final selection of seeds for delivery to the growers.
- Production techniques are tightly controlled and closely monitored, to assure highest quality seeds is being produced.



The mother palms are controlled - pollinated using exclusively selected pisifera by trained workers under stringent monitoring and supervision of experienced staff.

Certified and complied to the SIRIM Standard MS 157:2005.

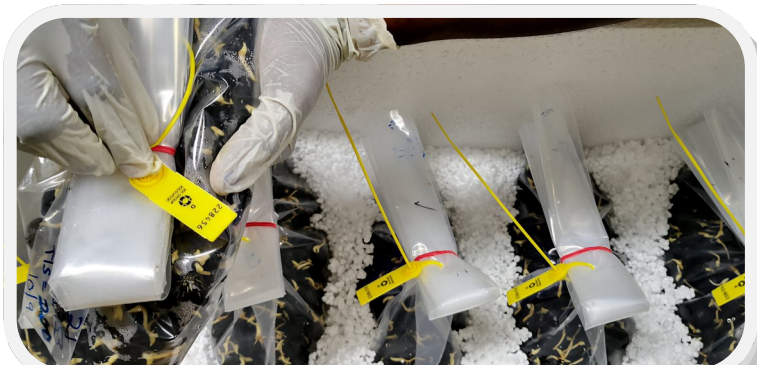
All of the mother palms selected for seeds production are audited in accordance to the latest SIRIM Standard MS 157:2017.



Individual germinated seeds are carefully checked to ensure only high quality seeds are selected.



Carefully screened and selected germinated seeds are securely sealed for delivery.



ASSURED QUALITY - Nursery Management with Best Practices

We assured to produce high quality seedlings from our nursery, using only exclusively IOI Deli Dura x AVROS planting materials.

Our germinated seeds are certified under the compliance of SIRIM's Standard MS157:2005 and lately, under SIRIM's Standard MS157:2017.



The seedlings raised in the nurseries are certified, complied in accordance to MPOB's Code of Practice (CoPN) - MPOB/COP/NN.

Our nursery seedlings are available for sale in the form of pre-nursery (pot-tray raised) and main nursery (large poly bag raised) seedlings.

Seedlings are scrutinised stringently and any non-conforming seedlings would be culled during the periodic culling exercise throughout the nursery stage.





Marketing Centre - Negeri Sembilan

IOI Plantation Sdn. Bhd. (1063669-A)

IOI Research Centre

2KM, Jalan Gemencheh - Batang Melaka,

73200 Gemencheh,

Negeri Sembilan Darul Khusus.

E-mail: ioi.research.centre@ioigroup.com

Phone: +606 - 431 7323/7334/7366

Mobile: +6019 - 656 9101

Fax: +606 - 431 9101/7766

Contact Person: Mr. Liew K. C.

E-mail: ioi.seed.marketing@ioigroup.com

Regional S.P.U - Sabah

Pamol Estates (Sabah) Sdn. Bhd. (27409-H)

Pamol Research Centre - Sabah

Mile 45, Jalan Sandakan / Telupid,

PWDT No. 164, 90009 Sandakan, Sabah.

Phone: +6089 - 515 664/515 004

Fax: +6089 - 515 617

E-mail: pamol.research.sabah@ioigroup.com

Regional S.P.U - Johor

Pamol Plantations Sdn. Bhd. (7822-P)

Pamol Research Station

8½ Miles, Jalan Mersing,

P.O. Box 1 86007 Kluang, Johor Darul Takzim.

Phone: +607 - 787 5124

Fax: +607 - 787 5129

E-mail: rck@ioigroup.com



IOI GROUP