

# PS7: HIGH BUNCH INDEX BREEDING POPULATION

by: JUNAIDAH, J; KUSHAIRI, A; ISA, Z A; MOHD DIN, A; NOH, A and RAJANAIDU, N

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**O**il yield (OY) is the most important selection criteria in breeding improvement programme. One way to increase OY is through increasing the bunch index (BI) besides increasing the oil to bunch ratio.

BI is derived from the ratio of bunch dry matter to total dry matter production (BDM/BDM+VDM). Estimation of the parameter requires the measurement of yield, trunk height and diameter, rate of frond production and petiole cross-section. BI and vegetative dry matter (VDM) production are highly heritable characters, therefore, it is important that they be considered in breeding experiment (Corley *et al.*, 1981). The significant heritable variation in BI suggests that neglecting this trait in selection may result in population of highly competitive palms (Kushairi *et al.*, 1999). Such palms perform well at the expense of their neighbours and a stand of them would not necessarily be high yielding (Hardon *et al.*, 1985).

## BREEDING FOR BUNCH INDEX

Materials selected for BI (Figure 1) are high yielding palms with low value of VDM. It is important to consider VDM in selection because it has been shown that selection for yield alone, without considering vegetative growth is likely to favour tall, vigorous and competitive palms (Corley *et al.*, 1981; Kushairi *et al.*, 1999). In practice, it will often be simpler to select for BI directly; the heritability of BI is similar

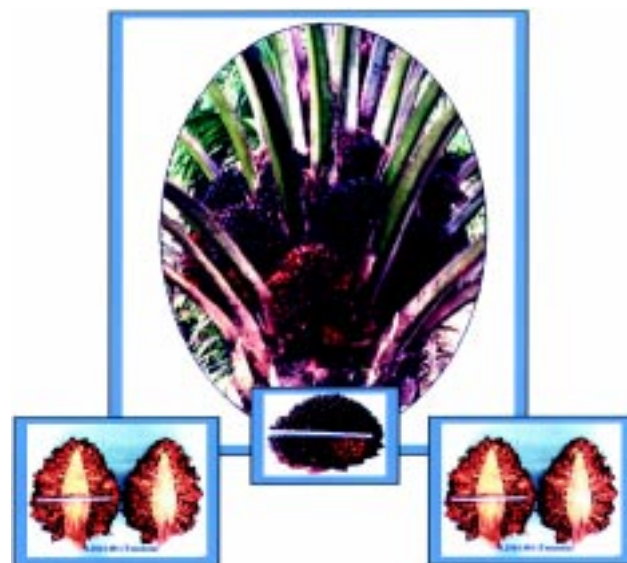


Figure 1. High bunch index palm and cross-section of bunches showing development of inner fruits.

to VDM, but BI appears to be less sensitive to soil fertility (Corley *et al.*, 1981).

Correlation analysis showed that BI is highly correlated with fresh fruit bunch (FFB), bunch number (BNO) and oil yield (OY) (Table 1).

## COMMERCIALIZATION POTENTIAL

Six *dura* (Table 2) and six *tenera* (Table 3) palms with high BI were selected based on BI. Palm 0.256/2064 with FFB yield of 272.58 kg palm<sup>-1</sup> yr<sup>-1</sup> is expected to produce OY at 8.56 t ha<sup>-1</sup> yr<sup>-1</sup>.

TABLE 1. CORRELATION MATRIX BETWEEN BUNCH INDEX WITH OTHER TRAITS IN TRIAL 0.256

Traits	FFB	BNO	ABW	OY	FDW	VDM	BDM
BI	0.72**	0.70**	0.15**	0.63**	-0.24**	-0.19**	0.72**

Note: \*\* Significant at P<0.01.

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Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, Malaysia  
P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. Tel: 03-89259155, 89259775, Website: <http://mpob.gov.my> Telefax: 03-89259446



**TABLE 2. *Dura* PALMS WITH HIGH BUNCH INDEX**

No.	Palm No.	Fruit type	Family	Bunch index	Fresh fruit bunch		Bunch number (No.)	Average bunch weight (kg palm <sup>-1</sup> yr <sup>-1</sup> )	Oil to bunch (%)	Oil yield	
					(kg palm <sup>-1</sup> yr <sup>-1</sup> )	(t ha <sup>-1</sup> yr <sup>-1</sup> )				(kg palm <sup>-1</sup> yr <sup>-1</sup> )	(t ha <sup>-1</sup> yr <sup>-1</sup> )
1	0.256/2058	<i>dura</i>	TZA 01.06	0.68	184.1	27.2	23.2	7.9	21.6	39.7	5.9
2	0.256/951	<i>dura</i>	TZA 01.06	0.59	224.6	33.2	23.2	9.7	18.0	40.4	5.9
3	0.256/971	<i>dura</i>	TZA 01.06	0.58	179.9	26.6	17.8	10.1	18.0	32.5	4.0
4	0.256/2300	<i>dura</i>	TZA 11.04	0.66	206.8	30.6	20.3	10.2	17.6	36.4	5.8
5	0.256/2125	<i>dura</i>	TZA 05.02	0.65	187.3	27.7	23.0	8.1	16.1	30.2	4.7
6	0.256/2313	<i>dura</i>	TZA 13.01	0.65	197.3	29.2	21.8	9.0	16.2	31.9	4.7

**TABLE 3. *Tenera* PALMS WITH HIGH BUNCH INDEX**

No.	Palm No.	Fruit type	Family	Bunch index	Fresh fruit bunch		Bunch number (No.)	Average bunch weight (kg palm <sup>-1</sup> yr <sup>-1</sup> )	Oil to bunch (%)	Oil yield	
					(kg palm <sup>-1</sup> yr <sup>-1</sup> )	(t ha <sup>-1</sup> yr <sup>-1</sup> )				(kg palm <sup>-1</sup> yr <sup>-1</sup> )	(t ha <sup>-1</sup> yr <sup>-1</sup> )
1	0.256/2064	<i>tenera</i>	TZA 01.06	0.66	272.6	40.3	20.7	13.2	21.2	57.8	8.6
2	0.150/500	<i>tenera</i>	NGA 12.05	0.68	246.9	36.5	25.7	9.6	22.8	56.2	8.3
3	0.150/4280	<i>tenera</i>	NGA 12.06	0.69	202.2	30.0	20.2	10.0	24.3	49.1	7.3
4	0.150/5974	<i>tenera</i>	TZA 01.06	0.69	259.4	38.4	16.3	15.9	22.5	58.4	8.6
5	0.256/816	<i>tenera</i>	TZA 05.01	0.58	211.4	31.3	18.8	11.2	22.8	48.1	7.1
6	0.256/654	<i>tenera</i>	TZA 05.01	0.69	245.4	36.3	17.7	13.8	23.1	56.7	8.4

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For more information kindly contact:

Director-General  
MPOB  
P. O. Box 10620  
50720 Kuala Lumpur, Malaysia.  
Tel: 03-89259155, 89259775  
Website: <http://mpob.gov.my>  
Telefax: 03-89259446