

POPULATION 12 - POLLEN FOR THE DEVELOPMENT OF DWARF PS1-TYPE OIL PALM PLANTING MATERIALS

by: KUSHAIRI A, RAJANAIDU N, RAFII M Y, MOHD DIN A
and MOHD ISA Z A

JUNE 2001

140

MPOB TT No. 100

MPOB INFORMATION SERIES (formerly known as PORIM Information Series)

ISSN 1511-7871

Developing dwarf planting materials to overcome the difficulties in harvesting tall palms is one of the objectives in the oil palm breeding programme. Concerted efforts using *Elaeis guineensis* Dumpy E206 and *Elaeis oleifera* have resulted in reduced height increments but often low yielding progenies. Extensive screening of MPOB-Nigerian germplasm collection has identified some high yielding dwarf populations and individual palms, such as Population 12 (Figure 1 and Table 1). The Nigerian-based parents in PORIM Series 1 (PS1) and PS1-type (PS1 and PS1.1) planting materials have been selected for dwarfness, high bunch number, high fresh fruit bunch (FFB) and good fruit characteristics (Table 2).

PRODUCTION OF PS1-TYPE PLANTING MATERIALS

PS1 was based on the dwarf MPOB-Nigerian *dura* x AVROS *pisifera*. In seed production, the female parents are usually limited. The use of *pisifera* (male) as the source for dwarfness would enable a larger number of crosses to the *dura* (female) parents for seed production. Hence, PS1.1 was produced using *Dura dura* x MPOB-Nigerian Population 12 *pisifera*.

Besides the high yield and ease of harvesting, it is anticipated that the planting density of the PS1-type planting materials could be increased to at least 170 palms ha⁻¹ without any adverse effect due to competition, hence, increasing productivity per unit land area.

RELEASE OF POLLEN

Population 12 *teneras* derived from selfings, sibblings and inter-crossings had been field planted at various MPOB Research Stations (Figure 1). Pollen from *pisifera* palms arising from the *tenera* x *tenera* (TxT) progenies are available to members of the industry for progeny testing with their own Deli *duras*.

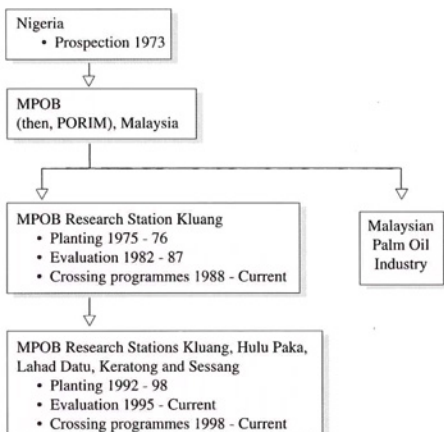


Figure 1. Development of MPOB-Nigerian oil palm populations.

TABLE 1. MEAN PERFORMANCE (*teneras*) OF MPOB-NIGERIAN POPULATION 12 AND THE MEAN OF 45 POPULATIONS IN TRIALS 0.149 AND 0.150 IN KLUANG

Population	FFB	BNO	ABW	F/B	M/F	O/DM	O/WM	O/B	OPY	HT
Population 12 in trial 0.149	200.24	18.24	11.66	61.96	76.41	75.68	49.97	23.66	47.47	1.83
Mean of trial 0.149	170.74	14.95	12.67	62.85	73.71	74.67	48.30	22.35	38.20	2.32
Population 12 in trial 0.150	173.80	17.63	10.30	65.03	73.54	72.64	47.13	22.52	39.87	1.65
Mean of trial 0.150	161.99	15.48	11.69	64.16	73.76	72.19	46.52	22.01	11.15	2.75

Notes:

Field planting of trials 0.149 and 0.150 in 1975 and 1976, height measurements in 1985 and 1986, respectively. Yield and bunch analysis in 1982-1986.

FFB = fresh fruit bunch (kg palm⁻¹ yr⁻¹). BNO = bunch number (No. palm⁻¹ yr⁻¹). ABW = average bunch weight (kg palm⁻¹ yr⁻¹).

M/F = mesocarp to fruit (%). O/DM = oil to dry mesocarp (%). O/WM = oil to wet mesocarp (%).

O/B = oil to bunch (%). OPY = oil per palm per year (kg palm⁻¹ yr⁻¹). TEP = total economic product (kg palm⁻¹ yr⁻¹).

HT = height (cm).

ISSN 1511-7871



Malaysian Palm Oil Board, Ministry of Primary Industries, Malaysia

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



TABLE 2. FAMILY MEAN PERFORMANCE (*tenera*) OF MPOB-NIGERIAN POPULATION 12 AND OTHER POPULATIONS IN TRIAL 0.337 IN HULU PAKA

No.	Progeny	Cross	Pedigree (population within parenthesis)		FFB	BNO	ABW	MFW	M/F	S/F	O/DM	O/WM	F/B	O/B	K/B	OPY	TEP	HT	
1	PK1021	TxT	0.149/14388	(11.19) x 0.149/12279	(19.11)	83.27	16.40	5.29	7.70	76.74	13.78	77.57	48.91	66.00	24.82	6.26	19.47	22.39	127.20
2	PK1038	TxT	0.150/5060	(12.06) x 0.150/5060	(12.06)	50.44	12.38	3.87	5.06	75.42	13.04	76.08	48.32	66.37	24.10	7.73	12.22	14.54	93.33
3	PK1039	TxT	0.150/1837	(12.06) x 0.150/1837	(12.06)	80.18	12.56	6.79	14.30	82.31	9.91	80.88	51.69	69.89	29.77	5.44	27.64	30.68	189.14
4	PK1040	TxT	0.150/1714	(12.06) x 0.150/1544	(12.06)	55.56	10.13	5.24	9.48	78.42	12.10	79.59	51.97	64.53	26.32	6.12	17.18	19.55	104.27
5	PK1101	TxT	0.150/1544	(12.06) x 0.150/1544	(12.06)	81.13	12.65	6.55	10.13	83.20	10.03	79.36	51.70	66.12	28.42	4.49	23.24	25.45	141.75
6	PK1105	TxT	0.149/11526	(12.01) x 0.149/11526	(12.01)	50.97	9.70	5.39	8.03	74.38	17.14	76.66	45.90	64.48	21.99	5.44	13.07	15.00	111.75
7	PK1137	TxT	0.150/1544	(12.06) x 0.150/1714	(12.06)	73.47	11.16	6.74	7.88	77.00	13.84	79.61	52.67	65.98	26.80	6.03	19.09	21.62	110.08
8	PK1140	TxT	0.149/14539	(14.03) x 0.150/1931	(19.15)	56.91	11.05	5.42	9.44	80.70	10.24	79.72	50.67	63.96	26.24	5.81	16.76	18.97	134.20
9	PK1151	TxT	0.150/1969	(12.04) x 0.150/1969	(12.04)	67.75	8.31	8.07	11.84	76.62	12.64	77.94	48.75	68.82	25.72	7.44	20.01	23.74	106.40
10	PK1154	TxT	0.150/4541	(10.13) x 0.149/12279	(19.11)	61.61	10.52	5.81	7.04	71.39	17.12	76.08	48.25	66.37	22.80	7.70	12.93	15.53	143.80
11	PK1198	TxT	0.151/128	(14.03) x 0.151/128	(14.03)	43.47	10.17	4.17	7.27	74.39	17.85	78.82	52.59	66.93	25.95	5.31	14.44	15.90	125.00
12	PK1201	TxT	0.150/2360	(12.04) x 0.150/1969	(12.04)	57.78	10.50	5.75	9.20	77.59	13.43	76.62	49.15	64.56	24.55	5.77	16.18	18.38	152.50
13	PK1211	TxT	0.150/2334	(12.04) x 0.150/2334	(12.04)	35.61	5.56	5.98	8.51	76.02	12.24	76.46	47.20	66.14	23.86	7.76	9.73	11.61	86.30
14	PK1228	TxT	0.150/2334	(12.04) x 0.150/1544	(12.06)	61.90	9.54	6.49	9.28	75.95	13.67	79.80	51.25	64.79	25.11	6.76	17.79	20.80	120.36
15	PK1254	TxT	0.150/5976	(12.04) x 0.150/5978	(14.16)	30.67	8.67	3.54	9.05	70.77	16.31	75.37	48.16	65.97	22.51	8.52	13.35	16.56	122.67
16	PK1276	TxT	0.150/2867	(14.16) x 0.150/2867	(14.16)	59.63	8.89	6.49	8.00	72.84	15.36	78.16	51.49	66.28	24.86	7.83	21.12	25.20	150.33
17	PK973	TxT	0.150/5115	(12.04) x 0.150/1967	(12.06)	68.30	11.24	6.14	8.28	69.13	16.62	76.33	48.68	67.69	22.79	9.68	13.08	16.46	70.43
18	PK982	TxD	0.150/66	(12.06) x 0.150/2036	(12.04)	60.03	11.62	5.11	7.69	68.61	17.98	75.10	49.10	66.35	22.31	8.90	16.56	20.57	93.83
19	PK1118	DxP*	0.175/182	(E206) x 0.174/872	(AWCOB)	49.15	4.67	9.69	9.73	80.98	10.71	79.32	48.89	66.86	26.52	5.56	15.79	17.80	179.67
MEAN						62.21	10.41	6.22	9.15	76.59	13.27	78.16	49.99	66.46	25.48	6.75	17.68	20.43	124.37

Notes:

- Link cross. Planted in September 1994. Yield and bunch analysis in 1998-2000. Height measurements in 2001.
- FFB = fresh fruit bunch (kg palm⁻¹ yr⁻¹). BNO = bunch number (No. palm⁻¹ yr⁻¹). ABW = average bunch weight (kg palm⁻¹ yr⁻¹). MFW = mean fruit weight (g). M/F = mesocarp to fruit (%).
- S/F = shell to fruit (%). O/DM = oil to dry mesocarp (%). O/WM = oil to wet mesocarp (%).
- F/B = fruit to bunch (%). O/B = oil to bunch (%). K/B = kernel to bunch (%).
- OPY = oil per palm per year (kg palm⁻¹ yr⁻¹). TEP = total economic product (kg palm⁻¹ yr⁻¹).
- HT = height (cm).

For more information kindly contact:

Director-General
MPOB

P.O. Box 10620

50720 Kuala Lumpur, Malaysia.

Tel: 03-89259155, 89259775,

Homepage: <http://mpob.gov.my>

Telefax: 03-89259446