

Short Communication

Genetic Resources: New Developments in Oil Palm Breeding

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Over the past 12 years, PORIM has accumulated a vast collection of oil palm genetic resources prospected in Nigeria, Cameroon, Zaire, Tanzania, Madagascar, and Central and South America. The collection is being screened to study the variation in fatty acid composition (FAC) as well as yield potential.

There is considerable variation in FAC in the Nigerian collection: a number of palms had oil with an iodine value (IV) exceeding 60 (*Table 1*).

With additional fractionation of this oil, the olein should attain an IV close to 70. With this value it would be possible to market palm olein as salad oil in countries with cold climates.

The material collected in Nigeria was evaluated in the field and the elite palms selected could yield up to 10–12 tonnes of oil per hectare per year, which is twice the current

yield of 5–6 tonnes. These high-yielding palms are also short, with a height increment of only 20–25 cm per year as compared with 45–75 cm per year for the current planting material (*Table 2*). Such dwarf palms could reduce the cost of harvesting and at the same time extend the replanting cycle.

The Nigerian palms with high IV, high yield and dwarf habit are being used to initiate entirely new breeding populations to produce planting material for high IV.

With the developments in tissue culture technique for oil palm, it is possible to multiply the palms with the desirable attributes rapidly. This programme is expected to lead ultimately to the commercial production of palm oil with highly unsaturated oil (high IV). According to the work schedule, the new planting materials should be available for exploitation by 1995 (*Table 3*).

TABLE 1. FATTY ACID COMPOSITION (%) OF CRUDE PALM OIL FROM NIGERIAN PALMS WITH HIGH IODINE VALUE

Palm No.	C14:0	C16:0	C18:0	C18:1	C18:2	IV
22	0.6	32.8	6.5	43.7	15.3	63.9
38	0.5	32.5	7.9	44.3	13.5	61.3
48	0.7	35.4	5.5	43.0	14.2	61.4
128	0.6	35.3	5.3	42.1	15.8	63.4
146	0.5	32.4	5.6	45.0	15.5	65.4
151	1.1	36.1	5.4	41.6	14.8	61.2
305	0.9	40.1	5.1	47.9	14.7	61.4
618	0.6	33.7	6.7	44.2	13.5	61.2
814	0.5	32.6	6.6	47.4	11.8	61.1
903	0.4	30.8	7.3	46.5	13.9	63.9
971	0.3	31.2	7.0	49.1	12.9	64.4
1861	1.4	37.0	6.4	36.2	17.6	61.4

Note:

C14:0 = Myristic
C16:0 = Palmitic
C18:0 = Stearic

C18:1 = Oleic
C18:2 = Linoleic

TABLE 2. HIGH YIELDING AND DWARF NIGERIAN *Tenera* PALMS

Trial No.	Family	Palm No.	Oil Yield per palm (kg/year)	Oil Yield per hectare (tonnes/ year)	Height Increment (cm/year)
0.149	28.17	12724	83.34	12.18	23.1
0.149	19.11	12279	75.94	11.24	21.5
0.149	13.05	12094	76.27	11.29	24.0
0.150	16.21	4352	70.39	10.42	24.9
0.150	19.13	3759	71.54	10.59	22.5
Current Planting Material				5 - 6	45 - 75

TABLE 3.

Item	Time
Evaluation and Identification	1982 - 1987
Pollination and Crossing	1987 - 1988
Harvesting and Germination	1988 - 1990
Nursery	1989 - 1990
Field Planting	1989 - 1990
Yield Recording and Bunch Analysis	1992 - 1995
Fatty Acid Composition Analysis	1992 - 1995
D×P seeds for high IV available in	1995