

Palm Oil in the Next Millennium*

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INTRODUCTION

Palm oil is one of the 17 major oils and fats produced and traded in the world. A total of 101.82 million tonnes of oils and fats were produced in 1998 of which 16.79 million tonnes were palm oil, accounting for 16.5% of the total oils and fats produced. Malaysia, with 8.315 million tonnes of palm oil produced in 1998 is the world's leading producer of palm oil. Production by Malaysia accounted for 49.5% of the total palm oil produced by the world in 1998 and contributed to 8.2% of world's oils and fats production.

Total exports of oils and fats in 1998 were 33 million tonnes of which the contribution by palm oil was 34.8%. Exports of palm oil totalled 11.48 million tonnes. Malaysia is the world's leading exporter of palm oil with 7.4 million tonnes, accounting for 62.8% of world palm oil exports or 22.5% of world exports of oils and fats.

This paper provides a status report on the Malaysian palm oil industry, which among others will include the area planted, production and exports of Malaysian palm oil products. Some new research developments will also be highlighted.

PLANTED AREA

Approximately 194.6 million hectares of land throughout the world were cultivated with oil crops in 1998 (*Table 1*). The total area planted with oil palm (mature and immature) was approximately 7.22 million

TABLE 1. WORLD PLANTED AREA WITH OIL CROPS (million ha)

	1996/97	1997/98
Soyabeans	69.19	71.06
Cottonseed	33.86	33.27
Groundnuts	21.73	21.99
Sunflowerseed	19.63	22.22
Rapeseed	23.37	25.48
Oil palm	5.39	7.22
Others	13.33	13.37
Total	186.86	194.61

hectares. The area with mature oil palm covered a total of 5.75 million hectares or 2.95% of the total oil crops producing area. This small area cultivated with oil palm was able to produce 16.5% of the total oils and fats production of the world.

Malaysia, the world's largest producer of palm oil, has a cultivated area of 3.07 million hectares (*Table 2*) of which 2.6 million hectares are with matured palms. Indonesia, the second largest producer has oil palm plantings covering 2.7 million hectares of which 1.74 million hectares are matured plantings. Nigeria, Ivory Coast, Thailand, Colombia, Papua New Guinea and others account for the balance of 1.45 million hectares.

TABLE 2. WORLD OIL PALM PLANTED AREA ('000 ha)

	1996	1998
Malaysia	2 416	3 075
Indonesia	1 547	2 700
Nigeria	355	358
Ivory Coast	159	159
Thailand	146	148
Colombia	124	128
Papua New Guinea	63	64
Others	578	588
Total	5 388	7 220

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In Malaysia, approximately 64.6% of the oil palm area encompassing 1.98 million hectares are located in Peninsular Malaysia while the balance are in Sabah and Sarawak, in the island of Borneo. The major oil palm expansion programme in the near future will be in Sabah and Sarawak where about 6.1 million hectares of land are available for cultivation. In Sabah, about 2.2 million hectares of land are considered suitable for oil palm cultivation.

PRODUCTION

World production of palm oil more than doubled from 4.54 million tonnes in 1980 to 10.94 million tonnes in 1990. It further increased by almost 60% to 16.79 million tonnes in 1998. The sharp increase in production has placed palm oil as the second largest oil produced after soyabean oil.

World production of palm oil suffered a rare decline in 1998, when production fell to 16.79 million tonnes from 17.6 million tonnes in the previous year. The decline in production was the result of the palms having reached the peak of their four-year cycle in 1997. Thus, production was expected to decline in the following year. The *El Nino* further accentuated the decline in production of palm oil. Production of palm oil in Malaysia declined from 9.07 million tonnes in 1997 to 8.3 million tonnes in 1998. Other countries that experienced decline in palm oil production included Thailand, Colombia, Nigeria and Papua New Guinea (*Table 3*).

Malaysia and Indonesia together account for about 80% of the world palm oil production. Malaysia contributed 49.5% of world output of palm oil and Indonesia about 31% in 1998. The Malaysian share was, however, higher at 57% in 1980 while Indonesia contributed 15% to the world supply.

Considering that about 6.1 million hectares are suitable for oil palm cultivation in Malaysia, the country would be able to supply sufficient quantities of palm oil for the ever-increasing world population. The oil palm industry in Malaysia is expected to

TABLE 3. WORLD MAJOR PRODUCERS AND PRODUCTION OF PALM OIL ('000 tonnes)

Producers	1997	1998
Malaysia	9 069	8 315
Indonesia	4 939	5 200
Nigeria	615	560
Colombia	441	427
Thailand	390	370
Ivory Coast	240	255
Papua New Guinea	271	230
Others	1 371	1 428
Total	17 336	16 785

attain a production level of 12.1 million tonnes by the year 2020. To realize this target, another one million hectares of new plantings of oil palm are required.

EXPORTS

Total exports of oils and fats increased from 27.8 million tonnes in 1996 to 32 million tonnes in 1997 and 33 million tonnes in 1998. These are significant increases and palm oil has a major lead in the export market accounting for 34.78% of world exports of oils and fats. Malaysia accounted for the largest share of about 63% while Indonesia accounted for 25%. Malaysia exports more than 85% of its annual production. In contrast, Indonesia exports only half of its production, the balance being consumed locally.

Most countries in the world are not self-sufficient in oils and fats and have to rely on imports to supplement their domestic requirements. However, some of the self-sufficient countries also import oils and fats in order to source for oils with specific technical properties.

Malaysian palm oil is imported by more than 130 countries. The major ones are as illustrated in *Table 4*. India emerged as the largest importer of Malaysian palm oil in 1998. Imports increased from 0.96 million tonnes in 1997 to reach 1.36 million tonnes in 1998. The major palm product imported was RBD palm olein which totalled 1.24 million tonnes or 91% of the total palm

products imported by the country. The decline in oilseeds production in India was the major factor contributing to the increase in imports of palm olein.

TABLE 4. MALAYSIA - EXPORTS OF PALM OIL TO MAJOR DESTINATIONS (tonnes)

Countries	1997	1998
India	963 642	1 361 973
EU ^a	729 117	1 062 808
Pakistan	1 132 988	1 020 097
China PR	1 065 393	912 193
Egypt	333 511	353 279
Others	3 265 318	2 714 382
Total	7 489 969	7 424 732

The European Union emerged as the second largest importer of Malaysian palm oil in 1998 with imports of 1.06 million tonnes of palm oil products. This was an increase of 333 691 tonnes or by 45.8%. Malaysian palm oil was able to accommodate the deficit brought about by the reduced sunflowerseed crop especially in France and Spain.

Pakistan was the third largest importer of Malaysian palm oil with 1.02 million tonnes of imports in 1998. RBD palm oil imports at 974 518 tonnes accounted for 96% of the total palm oil imported by the country from Malaysia.

The fourth largest importer of palm products from Malaysia was China. Its imports in 1998 totalled 912 193 tonnes which, however, was a decline when compared to imports in 1997 at 1.06 million tonnes. The decline in imports was due to the increasing local supply of oils and fats in the country. RBD palm olein accounted for 71% of the total palm oil products imported by the country.

PRICE

Palm oil prices had been at low levels in the past. However, the price had increased steadily since 1995. In 1998, its price touched a peak, the highest ever recorded in its

history. The price of crude palm oil averaged at US\$710 per tonne in 1998 at the Rotterdam market. Its price was in fact below US\$600 per tonne prior to 1998. Price of RBD palm olein had settled at US\$710 per tonne in 1998 compared to US\$626 per tonne for soyabean oil. This led to a premium of US\$84 per tonne, the biggest premium that had ever been recorded by palm olein.

The high price of palm oil in 1998 was mainly due to the global shortage of palm oil. As mentioned above, the world registered a fall of about 800 000 tonnes of palm oil from 1997 to 1998.

In the next few years, palm oil price would decline and settle at a lower price than in 1998 as supply of palm oil is expected to recover. Malaysian palm oil production is expected to increase to 9.04 million tonnes in 1999 and Indonesia to 6.0 million tonnes. Both countries would continue to produce about 80% of world's total supply of palm oil.

CONSUMPTION AND PRICE PROJECTIONS

World consumption of oils and fats is projected to continue to grow at 2.9% to 3.2% per year in the foreseeable future because of population growth and increase in per capita intake of oils and fats.

Current declines in price may be attributed to over production of soyabean and rapeseed oils. Consumption of oils and fats overall is still strong; palm oil production in 1999 will be no larger than that for 1997 when prices were relatively firm. Palm oil supply will not be a factor in any decline in world prices. It appears that soya and rapeseed oil production will have to be reduced if prices are to remain remunerative for the producers.

RESEARCH AND DEVELOPMENT

New Palm Oil Products

Prior to 1975, Malaysia had been expor-

TABLE 5. EXPORTS OF PALM PRODUCTS

Crude palm oil
Neutralized/refined/palm oil (Red)
Bleached/palm oil (Red)
Crude/palm olein (Red)
Crude palm stearin
Neutralized/refined/palm oil (Red)
Neutralized/refined palm stearin (Red)
Neutralized/refined/palm olein (Red)
Bleached/palm olein (Red)
Bleached/palm stearin (Red)
Neutralized/refined bleached deodorized/palm oil 6 red max (Red)
Neutralized/refined bleached/palm olein (Red)
Neutralized/bleached palm stearin (Red)
Neutralized/refined bleached deodorized/palm olein (Red)
Palm acid oil/palm fatty acid distillate
RBD hydrogenated palm oil
Hydrogenated palm fatty acid

ting crude palm oil as there was no refining industry in the country. With the advent of refining in Malaysia, the amount of crude palm oil exported declined to barely 1% presently. Exports of processed palm products had been increasing over the years where at least 17 palm products were exported by the country as shown in *Table 5*. With continuous research being conducted, there has been an increase in the range of palm products that are exported by Malaysia. The new products that have been developed through research are indicated in *Table 5* with the word 'red' in brackets. Red palm oil products can be obtained using a batch type refining facility with a modified process.

Red palm oil/olein contains not less than 500ppm carotenes, a precursor of vitamin A which is essential in the prevention of night blindness. A number of epidemiological studies have recently postulated its anti-cancer effects. Carotene is also associated with the retardation of the ageing process and in the prevention of cataract formation. The product is a practical substitute to the synthetic carotene presently used as a colouring agent as well as for the pro-vitamin A requirement in commercial production of light yellow margarine. The product also contains not less than 800ppm vitamin E.

New Planting Materials

PORIM has been doing research to widen the extremely limited gene pool of the current oil palm planting materials. Germplasms were prospected to enrich the oil palm breeding populations. The first collection was planted in 1976 and after extensive evaluation, two series of elite planting materials were introduced to the industry to meet the demands of the 21st century. The two new elite planting materials are the PORIM Series 1 (PS1) and the PORIM Series 2 (PS2).

PS1 is derived from seven selected families of *Dura* palms which have features such as high yield, dwarf growth and high bunch number (*Table 6*). The oil/bunch and oil/palm/year are 25% higher than the DxP control (*Table 7*). PS2 is developed from three selected families of *Dura* mother palms and possess high yield as well as high iodine value (*Table 8*).

TABLE 6. FEATURES OF PS1

Family	Yield (FFB)		Bunch number	Average bunch wt (kg)	Height increment (cm yr ⁻¹)
	kg palm ⁻¹ yr ⁻¹	t ha ⁻¹ yr ⁻¹			
1	204	30.3	20	10.08	16
2	217	32.2	17	13.63	15
3	226	33.5	13	17.64	19
4	207	30.7	19	11.94	15
5	211	31.3	17	12.28	18
6	225	33.4	22	10.46	18
7	218	32.3	23	9.92	19

TABLE 7. COMPARISON OF OIL TO BUNCH AND OIL/PALM/YEAR BETWEEN TWO GENETIC MATERIALS

Type of genetic materials	Oil bunch ^{1*}	Oil palm ^{1 yr^{-1*}}
Deli <i>dura</i> x Nigerian <i>tenera</i>	124.6	125.7
Control Deli <i>dura</i> x Avros <i>pisifera</i>	100.0	100.0

Source: Private Sector.

* Expressed as % of the control.

TABLE 8. YIELD AND IODINE VALUE OF PS2

Family	Yield (FFB)		Iodine value
	kg palm ^{-1 yr⁻¹}	t ha ^{-1 yr⁻¹}	
1	179.5	26.6	61.1
2	217.2	32.1	63.4
3	193.5	28.6	64.4

TABLE 9. AVAILABILITY OF PS1 AND PS2

Year	PORIM		Total	
	Series 1	Series 2		
1994	10 000	40 000	50 000	
1995	20 000	100 000	120 000	
1996	40 000	200 000	240 000	Experimental
1997	80 000	400 000	480 000	
1998	160 000	500 000	660 000	
1999	1 000 000	1 000 000	2 000 000	Commercial
2000	2 000 000	2 000 000	4 000 000	

PORIM had supplied a limited quantity of these elite planting materials for experimental plantings from 1994-1998 (Table 9). Production will be scaled up from this year.

Another new elite planting material, PORIM Series 3 (PS3), which has a high kernel content, has also been developed. It is known that the kernel content in an oil

palm bunch can be increased from 5% to >10% and PORIM has in its oil palm germplasm collections oil palm families with >10% kernel/bunch (Table 10). This new planting material will be able to meet the increasing demand for lauric acid (C12) by the oleochemical industry. Lauric oil is an important raw material in the manufacture of detergents and is normally met by oils from coconut and palm kernels.

TABLE 10. RANGE IN CHARACTERISTICS OF DURA MOTHER PALMS WITH HIGH KERNEL CONTENT

	Range
Fresh fruit bunch (kg palm ^{-1 yr⁻¹})	162.2 – 197.7
Bunch number (No. palm ^{-1 yr⁻¹})	8 – 24
Average bunch weight (kg palm ^{-1 yr⁻¹})	7.4 – 22.8
Kernel to fruit (%)	16.2 – 20.4
Kernel to bunch (%)	10.53 – 13.26
Oil per palm per year (kg)	21.9 – 33.21

