Study on Development of Oil Palm in Malaysia

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Abstract In the 1960s, Malaysia planted oil palm on a large scale. In the 1970s, it became the world's largest producer and exporter of palm oil. To further explore the development prospects of the oil palm industry in Malaysia, this paper first introduced the development of oil palm in Malaysia, and analyzed the world's share of Malaysian oil palm harvested area, production, yield during 1980 and 2016. The results showed that the oil palm harvested area in Malaysia reached the peak value 5.23 million ha in 2013; the yield of oil palm fruit reached the peak value 98.34 million t in 2015; the yield of oil palm fruit fluctuated between 14 – 20 t/ha; the ratio of Malaysian oil palm yield to world oil palm production reached its peak 51.99% in 1989. Therefore, Malaysia should update the old oil palm plantation. The development of oil palm harvested area and yield has reached the peak value, it is difficult to increase the harvested area. The proportion of Malaysian oil palm industry to the world oil palm industry is constantly declining. In future, the per unit area yield of Malaysian fresh oil palm fruit is expected to reach a new peak, and fresh oil palm fruit will exceed 20 t/ha.

Key words Oil palm, Harvested area, Yield, Per unit area yield, Analysis

1 Introduction
Oil palm is a perennial arbor of Palmaceae and an important woody oil crop in the tropical region. It is native to tropical Africa and is now distributed in the tropical region between 13 degrees north latitude and 12 degrees south latitude[1]. The main production areas include Malaysia, Indonesia, western and central Africa, northern South America, and Central America. Malaysian agriculture mainly relies on the development of cash crops. The main cash crops are oil palm, rubber and tropical fruits[2]. In the 1920s, Malaysia started to plant oil palm. With many years of planting experience, the oil palm industry continued to develop. For many years, Malaysia has been a major oil palm producer in the world, and the oil palm industry has become an important part of Malaysia’s economic development.

2 Overview of development of oil palm
Malaysia planted oil palm on a large scale in the 1960s, and the government takes various measures to support the development of the oil palm industry. Malaysian government stipulated that 60% of the new cultivated land should be planted with oil palm; Malaysia encourages private individuals to change the old rubber plantation and the old coconut garden into oil palm; it imposes export taxes on oil palm less than rubber, and allows farmers to use the rubber replanting subsidy in oil palm planting; it subsidizes farmers to set up oil mills, and provides convenience for farmers to refine oil; in addition, it establishes oil palm research institute to strengthen the research of oil palm planting, to solve the technical difficulties in the process of production. These measures promote rapid development of oil palm planting in Malaysia, making Malaysia become the world largest oil palm producer and exporter in the 1970s. According to statistics of the Malaysian Palm Oil Board (MPOB), the oil palm planting area of Malaysia was 310 000 ha in 1970 and 640 000 ha in 1975. In the 1980s, the oil palm planting area and yield of Malaysia continued to expand, surpassing rubber and becoming the most important export agricultural product.

The concentration of oil palm plantations in Malaysia is relatively high, and the production of oil palm in large oil palm planting becomes standardized[3]. The oil palm planting area of Malaysian Federal Land Bureau, Sime Darby, Kulim, IOI, and Golden Hope accounts for about 60% of the total oil palm planting area in Malaysia. The oil palm planting area of Malaysia’s IOI Group is greater than 250 000 ha. In the oil palm planting area, private plantations and government-managed plantations separately account for a half. In 2005, there were 3 736 oil palm plantations in Malaysia, with the oil palm planting area of 4.05 million ha, accounting for 33.75% of the total oil palm planting area in the world, and accounting for 50% of the total agricultural area of Malaysia.

In recent years, the development of oil palm planting area in Malaysia has slowed down. In 2014, the oil palm planting area was 4.85 million ha, 5.64 million ha in 2015, 5.74 million ha in 2016, and 5.76 million ha in 2017. In 2015, in Malaysia’s oil palm planting area, Johor, Pahang, and Perak had the largest area, 740 000 ha, 730 000 ha and 400 000 ha, respectively; 11 states in the Malay Peninsula had a total planting area of 2.66 million ha, accounting for 47%; the planting area of Sarawak state in East Malaysia was 1.44 million ha, accounting for 25%; the planting area in Sabah state was 1.54 million ha, accounting for 27%. In 2015, Malaysia’s young oil palm tree planting area accounted for 14% of the area, and oil palm harvested areas accounted for 86%.
3 Changes in the oil palm harvested area

Oil palm is a perennial tropical woody oil crop. Indonesia and Malaysia are the countries with large planting area. According to the statistics of the Food and Agriculture Organization of the United Nations, the oil palm harvested area was 40,000 ha in 1961, 150,000 ha in 1970, 780,000 ha in 1980, 1.75 million ha in 1990, 3.38 million ha in 2000, 4.85 million ha in 2010, and 5 million ha in 2016 (Fig. 1).

![Graph showing changes in oil palm harvested area in Malaysia from 1980 to 2016.]

Data source: FAOSTAT.

**Fig. 1** Changes in the oil palm harvested area in Malaysia in 1980 – 2016

As can be seen from Fig. 1, the oil palm harvested area in Malaysia has been increasing from 1980 to 2013. In 1980, the oil palm harvested area was 780,000 ha. In 2013, the oil palm harvested area reached the highest peak, 5.23 million ha. Compared with 1980, the oil palm harvested area increased by 571%, with an average annual increase of 17%. In 2014, the oil palm harvested area was 4.69 million ha, which was 10% lower than that in 2013. In 2015, the oil palm harvested area was 4.86 million ha, decreasing by 7% from 2013. In 2016, the oil palm harvested area was 5 million ha, dropping by 4% compared with 2013.

4 Changes in the oil palm yield

The oil palm planted in Malaysia is mainly the improved variety TENERA. After three years of planting, the production harvest period is up to 25 years. The production of oil palm fresh fruit and palm oil per hectare of oil palm plantation in the high yield period is 19 t and 4 t, respectively. The oil extraction rate is about 20%. Before 2005, Malaysia’s oil palm planting area and annual palm oil yield ranked first in the world. According to the statistics of the Food and Agriculture Organization of the United Nations, the oil palm fruit yield was 0.5 million t in 1961, 2.16 million t in 1970, 12.8 million t in 1980, 31 million t in 1990, 56.6 million t in 2000, 83.09 million t in 2010, and 86.33 million t in 2016. Due to the El Niño phenomenon, the weather in Southeast Asia was hot and dry. The oil palm fruit yield in Malaysia was 86.33 million t in 2016, decreasing by 12.01 million t compared with 2015 (Fig. 2).

According to Fig. 2, the oil palm fruit yield of Malaysia was basically rising during 1980 and 2015, reaching the peak value 98.34 million t in 2015. And it declined greatly in 2016.

![Graph showing changes in oil palm fruit yield in Malaysia from 1980 to 2016.]

Data source: FAOSTAT.

**Fig. 2** Changes in the oil palm fruit yield of Malaysia in 1980 – 2016

5 Changes in the percentage of oil palm harvested area and yield of Malaysia to the world oil palm harvested area and yield

With suitable climatic and soil conditions, Malaysia widely plants oil palm and has become a major producer of oil palm in the world. For many years, the oil palm planting area in Malaysia has been increasing, the harvested area and yield have been increasing year by year, and the oil palm harvested area and yield are in the front rank in the world. The percentage of Malaysia’s oil palm harvested area to the world oil palm harvested area was 1.1% in 1961, 4.6% in 1970, 18.2% in 1980, 28.6% in 1990, 32.6% in 2000, 28.8% in 2010, and 23.7% in 2016. The percentage of Malaysia’s oil palm fruit yield to the world oil palm fruit yield was 3.7% in 1961, 14.2% in 1970, 42.9% in 1980, 50.9% in 1990, 46.9% in 2000, 37.2% in 2010, and 28.8% in 2016 (Fig. 3).

![Graph showing changes in the percentage of oil palm harvested area and yield of Malaysia to the world oil palm harvested area and yield from 1980 to 2016.]

Data source: FAOSTAT.

**Fig. 3** Changes in the percentage of oil palm harvested area and yield of Malaysia to the world oil palm harvested area and yield

From Fig. 3, it can be seen that the percentage of Malaysian oil palm harvested area to world oil palm harvested area (33.1%) reached the highest peak in 1999, then it gradually dropped, it was 23.7% in 2016; in 1989, the percentage of Malaysian oil palm yield to the world oil palm yield reached the peak (52.0%), later it took on wavy decline, and the percentage dropped to 28.8% in 2016.
6 Changes in the per unit area yield of oil palm

According to the statistics of the Food and Agriculture Organization of the United Nations, the per unit area yield oil palm in Malaysia was 12 t/ha in 1961, 14 t/ha in 1970, 16 t/ha in 1980, 18 t/ha in 1990, 17 t/ha in 2000, 2010, and 2016 (Fig. 4).

Data source: FAOSTAT.

Fig. 4 Changes in the per unit area yield of oil palm fruit of Malaysia in 1980 – 2016

From Fig. 4, it can be seen that the per unit area yield of oil palm fruit of Malaysia fluctuated in 14 – 20 t/ha, it was the highest (20 t/ha) in 1982, 2008, 2014, and 2015, it was the lowest (14 t/ha) in 1998. In recent years, the per unit area yield of oil palm fruit remained the high position (17 – 20 t/ha), and is expected to reach a new peak in future.

7 Conclusions and discussions

7.1 The oil palm development staying at the peak stage

The arable land area of Malaysia is about 13.53 million ha. In 2017, Malaysia’s oil palm planting area accounted for 43% of the total arable land. In 2013, oil palm harvested area of Malaysia reached its peak, ending the rising trend over the years. In 2016, the oil palm harvested area dropped by 4% compared with 2013; the oil palm fresh fruit yield reached its peak in 2015, and the oil palm fresh fruit yield in 2016 reduced by 14% compared with 2015; at the same time, the development speed of oil palm planting area in Malaysia slowed down obviously, and oil palm planting was mainly upgrade of old oil palm plantations. Therefore, judging from the percentage of oil palm planting area in Malaysia to the total area of arable land and the demand to update the old oil palm plantation, it is expected that the development of oil palm harvested area and production in Malaysia stays at the peak stage, and it is difficult to realize a high growth in the harvested area, and the increase of yield will mainly depend on the increase in the per unit area yield.

7.2 The percentage of oil palm industry of Malaysia to the world oil palm industry constantly declining

Before 2005, Malaysia’s oil palm planting area and annual palm oil yield ranked first in the world. Since 2006, Indonesia’s oil palm plantation has been growing faster than Malaysia, taking the place of Malaysia as the world’s largest oil palm grower. Besides, Malaysia’s oil palm harvested area accounted for 33.1% of the world’s oil palm harvested area from 23.1% in 1999 to 23.7% in 2016. Oil palm yield accounted for 52.8% of world oil palm yield in 1989, dropping to 28.0% in 2016. The harvested area and yield of oil palm from Malaysia showed a significant decline trend. It is predicted that the proportion of Malaysian oil palm industry in the world oil palm industry will continue to decline.

7.3 The per unit area yield of oil palm expected to reach a peak

From 1980 to 2016, the world’s per unit area yield of oil palm fruit was in the range of 7 – 15 t/ha. In the same period, the Malaysian per unit area yield oil palm fruit was in the range of 14 – 20 t/ha. It can be seen that Malaysian per unit area yield oil palm fruit is relatively high. The technical level of oil palm planting in Malaysia is relatively high, and the old oil palm plantation is gradually updated. The newly planted and updated oil palm plantation will continue to increase the per unit area yield. It is estimated that the per unit area yield of Malaysian oil palm fresh fruit is expected to reach a new peak (20 t/ha).

References


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