30 TONNES FFB TECHNOLOGY FOR OIL PALM GROWERS - A CASE STUDY ON COASTAL AREA

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The average fresh fruit bunch (FFB) yield varies between sectors of the industry and sites. It ranges from 8 t/ha/yr produced by the independent smallholders to 22 t/ha/yr by private estates. Several factors contribute to this difference in performance. They include soil type, planting material, climate and agro-management practices. MPOB through the Smallholders Development and Technology Transfer Unit has carried out various activities to increase the productivity of oil palm growers especially the smallholders. One of the activities involves the establishment of demonstration plots at various places throughout Malaysia.

A demonstration plot established in 1995 on a smallholder's land in Sabak Bernam, Selangor has performed very impressively in terms of vegetative growth and productivity. Scout harvesting of the oil palm commenced at 23 months after planting and FFB production for the first two years are as follows :

Harvesting Year	Palm Age (Months)	FFB Yield (t/ha)
Scout harvesting	23 - 29	4.31
First	30 - 41	21.61
Second	42 - 53	35.61

A study was carried out to identify the main factors that contribute to the high early yield obtained. The findings are discussed in this paper.

Vigorous growing palm and high yielding

BACKGROUND OF THE SMALLHOLDER AND THE HOLDING

The successful owner of the demonstration plot is En. Ahmad Sidek. He is 43 years old and works as a full-time farmer after completing his form five education at a secondary English school in Sabak Bernam. In addition to this

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holding, he has another three plots planted with oil palm in the same area and performing quite well. The FFB yield of two of the plots is as follows:

	Plot 1	Plot 2
Planting date	August 1991	July 1992
Area	2 ha	2 ha
FFB yield (t/ha)		
First year harvest	12.6	n.a
Second year harvest	23.8	22.8
Third year harvest	33.4	34.0
Fourth year harvest	38.3	34.7

n.a - not available

The other holding has just started scout harvesting at 24 months after planting.

The holding under study is located at Kg. Tebuk Berihun, about 6km west of Sabak Bernam. The size of the area is 2ha and provided with a main drain prepared by Department of Irrigation and Drainage. There is a paved road connecting this holding to other parts of the village. Before oil palm, the area was planted with coconut.

The annual rainfall of the area is about 2,200mm (average for 1976-1998 taken at Ulu Bernam Estate about 30km away) with four slightly dry months (between 130 – 140mm/month) in January, February, June and July.

The soil of the holding is Bernam Series developed over marine clay deposits. It has a silty clay to clay textures and coarse to medium blocky structures. The top soil is deep, more than 100cm. It is sticky when wet and hard when dry. The drainage is poor and the pH in the topsoil is 5.0 to 5.5. The soil has moderate limitation in terms of soil fertility for oil palm planting.

With optimum agro-management, harvesting could be initiated 2 years after planting

TECHNOLOGY FOR HIGH YIELD

The study has identified several agro-management inputs that contribute to the high early yield obtained. These can be recommended for adoption by other growers especially smallholders and small independent estate owners. These include:

1. **Use of genuine DxP material**
   The planting material was obtained from two registered seed producers.

   From the fruit typing work carried out, it was found that 99% of the palms are DxP type. Using of genuine DxP material is essential to achieve the yield potential of oil palm.

2. **Proper land-preparation technique**
   Old coconut trees were chipped (10 – 15 cm thick), stacked, burned, restacked, and reburned. Burning was done about 4 – 6 weeks after stacking.

   The land was ploughed to break the root mass from the old coconut stumps and the soil loosen to promote faster root growth of the newly planted oil palm seedlings.

   Field and collection drains were constructed to discharge excess water during wet season. The size of field drains was 0.9m x 0.9m x 0.6m. They were constructed at every 4 oil palm rows and connected to the perimeter drains which served as collection drains. All throughout water level in the field drains was maintained high about 60cm from the soil surface.

   A field-road was constructed running in the middle of the holding perpendicular to the main road. This is to ease field operation especially in-field transportation of ffb.

3. **Right planting technology**
   Oil palm was planted using 12 months old seedlings at density of 148 palms/ha

following the 8.84m x 8.84m x 8.84m triangular planting system. Using healthy growing 12 – 15 months old seedlings will normally achieve early yield.

Planting was carried out in September i.e beginning of the rainy season. Planting at the onset of rainy season will reduce planting shock, ensure uniformity and early growth of the palms.

4. Good field management / maintenance

Chemical weeding was carried out every three months. The amount of chemical used depended on the type and thickness of the weeds. Usually, 8 – 10 litres of Paraquat was used per round for the whole area of two hectares.

Regular weeding was required during the early stage to minimize competition for moisture and nutrients to the palm. This help to promote early growth and yield. At the later stage, weeding helped to ease harvesting especially the loose fruits collection.

No disease incidence observed in this holding thus far. However, regular checking was carried out for incidence of basal stem rot disease. Rhinoceros beetle and cockchafer were two major pests. They were controlled using several kinds of pesticides to avoid damage to the palms. Examples of pesticides used were Carbofuran for controlling rhinoceros beetle and Carbaryl, Fenvalerate or Malathion for cockchafer.

Manuring was carried out based on the following guidelines :

- use of right fertilizers
- correct rate and combination of fertilizers
- correct placement of fertilizers
- right time / frequency of application

The manuring programme carried out was as in *Table 1*.

During the immature stage (first – 3 years old), fertilizers were broadcasted in the

TABLE 1.

Palm Age (year)	Round	Type of Fertilizer	Amount (kg/palm)
0 – 1	1	Component 45+B	0.3
	2	Component 45+B	0.3
	3	Rock phosphate	0.1
		Component 45+B	0.3
1 – 2	1	Component 45+B	1.0
	2	Component 45+B	1.0
	3	Component 45+B	1.2
		Urea	0.3
2 – 3	1	Component 45+B	1.4
	2	Component 45+B	1.4
	3	Component 45+B	1.6
3 - 4	1	Component 45+B	1.7
		Urea	0.5
	2	Component 45+B	1.7
		MOP	0.5
	3	Component 45+B	2.0
4 – 5 and above	1	Component 45+B	2.0
		Urea	0.5*
	2	Component 45+B	2.0
		MOP	0.4
	3	Component 45+B	2.0

* when required – if palm shows N deficiency symptom after flooding.

weeded-circle area. For palms 4 years and above, fertilizers were broadcasted in broad circular band around the edge of canopy where most of the feeder roots were found.

The right number of fronds was always retained on every palm. The following pruning policy was adopted :

Up to 3 years	-	remove only the desiccated fronds
4 – 7 years	-	retain 48 – 56 fronds/palm
8 – 14 years	-	retain 40 – 48 fronds/palm
> 15 years	-	retain 32 – 48 fronds/palm

The first systemic pruning commenced when the lowest bunches were about 0.9m above the ground. No overpruning was ever allowed to happen which normally would cause the palms to experience stress and produce dominantly male flowers.

Typical 4 years old palms in the study area

5. **Efficient harvesting**
To obtain optimum yield, crop recovery has to be maximized. For this purpose, farm road and harvesting paths were properly constructed to ease bringing out the bunches from the field. The bunches were harvested using the 'at least one loose fruit per bunch' ripeness standard.

6. **Integration of banana**
Banana was integrated in the interrow areas during the immature stage of palms. The vegetative residues of the banana were spread all over the area during the thinning, pruning, harvesting and felling activities.

The organic residues from the banana plants increased the soil organic matter, nutrient and moisture contents. These improved the soil fertility and contributed to the high oil palm yield obtained.

HUMAN FACTORS

Besides the optimum agro-management inputs, En.Ahmad Sidek who managed the holding himself played a big role in realizing the high yield. He has the following positive qualities :

- Right attitude - always willing to change and adopt new technology
- Total commitment – practices the technology, works hard and closely supervises the holding to ensure the field operations are carried out according to schedule and technical specifications. He keeps proper farm record to monitor and evaluate current and overall achievement.
- Self confidence – believes that any venture that is properly and systematically carried out and managed and with full effort given will end up with success.

CONCLUSION

Oil palm requires complete attention and favourable conditions to grow well and produce high yield. Information on the various aspects of agronomy and management of oil palm to increase productivity are mentioned in this paper. These should be practiced if a grower wishes to achieve high FFB yield exceeding 30t/ha/yr.

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