

SUSTAINABLE GROWTH OF KULIM'S PALM OIL BUSINESS WITH SPECIAL REFERENCE TO MALAYSIAN OPERATIONS

**Teo Leng
EPA Management Sdn Bhd**

ABSTRACT

Kulim's palm oil business has been growing sustainably over the years. It has diversified its plantations geographically and expanded its downstream business activities. Performance to-date has been very satisfactory, but more could be done to enhance competitiveness through further improvement in productivity and efficiency. A well planned development of human capital is vital in ensuring future success in sustainable growth. Meanwhile all employees must be made aware of the new challenges before them. A change to a market driven mindset is deemed necessary and desirable for the triple bottom lines of the company.

INTRODUCTION

There is no doubt that Kulim (Malaysia) Berhad has been and still is an economically sustainable business entity. The long history of some 71 years is itself a testimony of Kulim's corporate resilience and effective management. During the last 29 years the company, upon listing in the Kuala Lumpur Stock Exchange (now Bursa Malaysia Bhd) in 1975, has evolved from a rubber based plantation company to a palm oil based plantation company. It has also grown from the original 5 estates (totalled 8,264 ha) to the current 15 estates having a combined area of 33,154ha. Operationally, the company has been profitable even in 1986 and 2001 when palm oil prices were at their historic low.

The nineties witnessed the transformation of Kulim from a Johor state based medium sized plantation company to one that owns an oleochemical subsidiary at Pasir Gudang, Johor and ventured into Papua Guinea and Indonesia. The Group aims at 'delivering value' through geographical diversification in plantations and synergy in downstream activities.

Natural Oleochemical Sdn Bhd, the downstream subsidiary of Kulim, has undergone very rapid expansion in capacity from 45,000 TPA in 1994 to 150,000 TPA in 1997, and eventually to 380,000 TPA by next year. The esters plant was expanded from 4,500 TPA in 1994 to 7,400 TPA in 2003. Product line expanded in 2003 to include soap noodles with a plant capacity of 47,000TPA. Acquisition of New Britain Palm Oil Limited in late 1996 has led to a progressive expansion of oil palm area from about 16000 ha to the current 30,000 ha in PNG. A 100,000 tons refinery was commissioned in March 2003 as part of the expansionary program for both local and export markets. In Indonesia the planted area is slowly building up since 1995 to the current level of 22,767ha. The current land bank of the Group in Indonesia is nearly 80,000 ha. A 40 tons/hour palm oil mill was constructed at Lahat, South Sumatera, and fully commissioned by January 2004 so as to cater to the milling needs of the 3 estates in this region.

Could growth be sustained at the home front? What would be the prevailing and anticipated challenges? What steps/actions should we take to ensure the continual attainment of the 'triple bottom lines' in the years ahead? This paper will first review the 2003 and current position of the plantation operations in Malaysia, and throw some light on the questions raised, while at the same time hope to hear from you your views/suggestions in moving the company forward.

REVIEW OF PLANTATION/MILL OPERATIONS

Crop Performance

2003 was a bountiful and exceptional year both in yield performance and selling price (of CPO) achieved. Kulim's estates attained the highest average yield of 26.91 tons/ha FFB (while yield of EPA managed estates averaged 25.35 tons/ha). This was the best yield performance ever recorded for the Group. Average yield increased by 16.7% as compared to that of 2002. The highest yielding estate was REM Estate with an average yield of 30.47 tons/ha.

The half yearly yield of 2004 at 10.22 tons/ha is 2.0% below the seasonal estimate and 9.0% less the corresponding period of 2003. This is in agreement with the seasonal yield trend in Peninsular Malaysia. The final average yield of Kulim's estates is expected to be between 23-24 tons/ha by yield end.

Mill Performance

The 3 Group mills processed a total of 708,901 tons FFB in 2003. Some 25.42% of the crop was purchased from outside the Group. The average OER and KER for the year were 18.72% and 5.53% respectively. Half yearly performance in current year was more superior than last year as reflected in better extraction rates. The average OER and KER for this period under review were 19.46% and 5.52% respectively. Better performance achieved was due in parts to better fruit quality (lower hard bunches % and trash content, and higher loose fruit %) and process control. The importance of process control to minimize oil loss needs no further emphasis.

The harvesting criteria have been amended from 1 loose fruit per bunch on the ground to 1 to 3 loose fruits per bunch on the ground coupled with 10-12 days harvesting intervals. The objective is to allow a greater degree of ripeness for estates having adequate harvesters. Achieving the ideal harvesting interval is a real challenge as it is very much dependent on labor availability, cropping trend and harvesters' productivity. Better extraction achieved during the first half of current year can only be sustained if workers are available to sustain the desired harvesting interval. The cumulative mature area during 2003 that exceeded 15 days interval in harvesting was some 67,280ha in all the EPA managed estates. Cumulative area of delayed harvesting for first half of 2004 was 25,812ha.

Mechanisation Performance

Mechanisation performance of the various operations are summarized in Table 1 for the year 2003. It is pertinent to note the following salient points:

1. Operational cost of Kulim system (either lorry or tractor fitted with crane) of crop evacuation continued to improve as a result of a higher volume evacuated to mills. The Group is however evaluating a new system (Kulim-Badang system) that does not require the use of crane. Results obtained thus far are very promising, and will be presented by Mr. S. Arumugam at this conference.
2. Harvesters' productivity using mechanical buffaloes (MB) has been stagnating due to no change in the operation system. The rising cost of MB from less than RM5,000 per unit in 1987 to the current price of RM 12,500 per unit invariably led to a higher level of subsidy by the company in the use of MBs. This is to some extent mitigated by extending the useful life span of MB by years. The suitability of using China engine (that is significantly cheaper than Yanmar engine currently in use) is being evaluated with the view to further mitigate the rising cost.
3. Harvesters' productivity using live buffaloes is not inferior to the MB system (Table 2). This system does not require any subsidy. It also has the merit of minimising immigrant workers from abscondment, while at the same time it is an indirect saving for them when they dispose off the animals they owned at the expiry of their work permit. The prospects of reintroducing live buffaloes for suitable area are being reviewed for phased adoption in 2005.
4. Mechanical spreading of fertilizer remained very cost effective throughout the Group in areas accessible to tractors. A potential weakness in the system when the tractor and attendant are paid on piece rated basis. The likelihood of uneven distribution of fertilizer is avoided by introducing the system of fixed loading and unloading stations along field roads for the ease of the tractor driver. The number of bags of fertilizer at each station is just sufficient to fill up the capacity of the hopper. This system is strongly emphasized to achieve higher yield under uniform application for each manuring block, particularly in current situation of escalating fertilizer prices.
5. EFB mulching and POME application were carried out as a matter of routine in 'by-products' utilization. This effort of nutrient recycling will be totally replaced by 2006 when all the mills adopt MIWAMAS system of composting, a zero discharge technology. Application of compost is a lot easier than the current method of utilizing EFB and POME for land application.
6. Weeding operations were generally in satisfactory order despite monthly shortage of field workers. Weeding costs were well controlled.

Cost of Production and Processing

Cost of FFB production and milling cost are summarized in Table 3. The cost of FFB production in 2003 at RM 105/ton is less than previous year due to higher yield achieved. Over the last 10 years we have been able to maintain the average cost of FFB production between RM 100 to RM 125 per ton (Fig. 1). This cost will not be attainable in current year due to very significant increase in fertilizer prices. It is estimated that cost of manuring increased by about RM 7/ton

FFB. The situation is not expected to improve in the coming years. Processing cost for 2003 and first half of 2004 are RM23.82/ton and RM28.48/ton respectively. Processing cost in current year will be comparable to 2003 by year end.

Work Force Situation

Not having sufficient number of workers has been and still is a perennial problem. This problem has led to untimely completion of work programs in estates, and more importantly varying degrees of delay in harvesting. Shortages of workers are summarized in Table 4. In 2003 cumulative area that exceeded 15-day harvesting interval was as big as the entire plantation area under harvesting.

Labor requirement at palm oil mills is generally more stable and adequate.

CHALLENGES AHEAD IN 21st CENTURY

Agriculture is shifting from a production-driven to a consumer-driven industry, and moving towards industrialization and product specialization. Palm oil industry, just like every other industry, is no exception. It is also facing global pressure associated with trade liberalization and requirements, as well as globalization. The key to maintaining and sustaining competitiveness and stay ahead is to focus on good agricultural practices (GAP) and food safety management. The way forward for Kulim is to build on the past efforts to further upgrade and enhance its efficiency and productivity.

For the growth of the company to remain sustainable, there must always be visionary leadership at the helm coupled with a team of competent and dedicated lieutenants.

Physical Expansion

The prospect of physical expansion in Malaysia through acquisition of new land is less probable than the acquisition of established plantation as was the case in the acquisition of Ladang Sepang Loi, a 1,155ha estate, in 2004. Unlocking the land value of urban estate like UTE would provide adequate fund for further expansion in new and/or planted area. However it must be categorically stated here that it would be wise for the company not to acquire marginal and/or environmentally sensitive land for obvious reasons.

Yield Enhancement

There is no other better way than yield enhancement in order to reduce cost of production and maintain competitiveness. Yield enhancement is in fact strategic in crop production in a situation when there is little or no prospect in increasing planted area. Adherence to good agricultural practices (GAP) by all estates is essential in both sustaining and enhancing yield levels. The approach to achieve high early yield is strongly emphasized. Excellent care for the growth of palms during the initial years is vital. Effective agronomic works such as stringent nursery selection, precision manuring, moisture conservation, etc are important contributory factors in yield enhancement. Site yield potential of our oil palm fields must be established by our agronomists. Yield gap analysis is to be carried out to identify limiting factors, which account for

the disparities between potential and performance, for remedial and mitigating actions. It is then the task of planters to ensure high standards and quality of works. Suffice for me to say here that estate management must aim for effective control at all points of implementation.

Clonal planting is a well known approach to achieve higher palm product per ha than normal D x P seedlings. Under the prevailing scenario in Malaysia there is very little prospect of having clonal material for large scale planting unless one has his own tissue culture laboratory. The breeding and selection effort over the last 10 years has placed the company in a situation capable of embarking on tissue culture of oil palm. One of the major outcomes of our breeding programs is the identification of excellent ortets from progeny trials having very high FFB yield and oil:bunch ratio ready for exploitation. The impending joint venture with an existing tissue culture laboratory would eventually see the first commercial clonal planting in the Group in not too distant future. Clonal plantings should eventually account for 30-50% of total plantings some 10-15 years down the road.

Cost Reduction/Maintenance

Under the MAPA/NUPW collective agreement wages are revised every 3 years. This arrangement invariably leads to increase in cost of production without any appreciable increase in labor productivity. The rising trend in labor wages is clearly evident from Fig. 2. Field worker and harvesters' wages have increased by 58% and 34% respectively in the last 10 years. Should there be any substantial increase in harvesters' productivity by any mechanical mean or improved innovation, the direct saving to the employer is in fact insignificant (Table 5). Conversely harvesters' earnings increase dramatically! Any cost reduction to the company is through indirect saving from payment of fringe benefits as a result of a reduced number of workers needed for the operation. A more equitable system would have to be revised so that both workers and employer enjoy similar benefit from high labor productivity.

GAP/BMP

Good agricultural practice and best manufacture practice both imply cost effective application of appropriate science and technology. Over the years the Group has contributed and assimilated some of these practices. For instance, the Group started zero burn technique of replanting as early as 1984 at Ulu Tiram Estate. In 1985 we collaborated with PORIM (now MPOB) in the barn owl project that became a standard feature in our Group estates (and in other companies as well). During the mid 1980s we popularized the use of controlled droplet applicator (CDA) for weed management. In 2001 we established the first commercial composting plant in the country. The MIWAMAS (mill integrated waste management solution) system as the name implies is a green technology that is capable of zero discharge from palm oil mill. Of late we revisit the legume covers issue, and now we re-introduce the policy of establishment of legume covers. But we decided to plant *Mucuna bracteata*, a shade tolerant creeping legume cover instead of the traditional species.

There is increasing pressure for the oil palm industry to minimize the environmental footprint. We are committed to the adoption of GAP/BMP as we already are a practitioner. The spirit of continuous improvement and readiness to try out new innovations must be upheld.

Human Capital

With challenges ahead becoming more complex and varied, there is a strong need for capacity building particularly in the area of building up human capital.

The capacity and quality of works in both estates and mills is largely dependent on the management team. Having adequate number of competent managers/assistants is increasingly becoming a problem to the industry. As a temporary measure retired personnel are rehired, and inter-company pinching is becoming more common place in the industry. This does not in any way auger well for the bottom line of cost and profitability. There is urgent need to confront the issue on the company basis through a 2 –prong approach. Firstly, Kulim must continue to evolve itself as *a company of choice*. Positive attributes of a progressive company must be internalized and visible. This should be a medium to long term objective. Secondly, stringent recruitment and training should serve our short and medium term needs. The earlier proposal of 80/20 approach on this matter warrants due attention. The potential success of this strategy is based on the following observations/assumptions:

1. A university qualification is not a guarantee in becoming an effective professional planter. Invariably, graduates often have a higher expectation in terms of career advancement and monetary reward as in non-plantation sectors. Mismatch in expectation between graduate employees and employer ultimately leads to inferior work standards.
2. Secondary school leavers (inclusive of agricultural institute and diploma holders) generally have a lower expectation than graduates with respect to career and compensation. So long as they have positive attitude and people skills, they could eventually become an all-round effective planter after attending on-the job trainings and dedicated courses on plantation management. Acquisition of plantation knowledge is only limited by their eagerness to learn.
3. Graduates tend to have more options in term of positions in job market while a managerial position in a plantation company can be regarded as a worthwhile career to suitable secondary school leavers.
4. A progressive company aiming for sustainable growth must always have a small team of brainy and dynamic senior executives.

It is proposed that suitable secondary school leavers with outdoor inclination be recruited through concerted effort directly from schools as cadet planters for the eventual position as estate manager in their career. They are to be trained specifically for the job. A small selected group of high academic achievers in secondary school/pre-university be offered the scholarship to study in reputable universities in fields relevant to company's need. They will be tested and put onto the fast track of their career path should they prove to be highly competent and competitive. Not withstanding the above proposal, the company must continue to recruit capable staff and executives under the current situation of having to deploy some existing employees from Malaysian operation to Indonesian operation.

Immigrant Workers

Immigrant workers account for two third of the total work force at estates and mills. The present government policy, subjected to change as in the past, allows an immigrant worker for plantation a 3+1+1 years of work permit. However a large proportion of immigrant workers return home after 3 years of service without wanting to extend the stay for several varied reasons. The rapid turn over of immigrant workers is not only costly to recruit but also causing estates to suffer low labor productivity during the training period. The uncertainty in the approval of labor quota and the administrative delays by the authorities and recruitment agency manifest itself as a continuous shortage of workers throughout the year.

The situation calls for an urgency in exploring new innovations that can enhance both labor and machine productivities. Kulim must not solely depend on the national research body and members of the industry for creative innovations to achieve excellence. We must invest in our own research to cater for our own needs.

As a possible solution to overcome low labor productivity of immigrant workers during the training period, it may be feasible to deploy systematically experienced and diligent harvesters from our own plantations in Sumatera to Malaysian estates. The higher earning in Malaysia may serve as an incentive for harvesters in Indonesia to strive harder as a pre-requisite for selection. These harvesters are also assured of a job when they return home after 'an overseas posting'.

Consumer Demands For Food Safety And Environmental Care

Society is demanding higher standards of environmental performance from industry across the board, not just agriculture. Demands for food safety and environmental care take on an unprecedented zealotry not only in Europe but also in the rest of the world. It is not unreasonable for consumers to demand for quality and safe palm oil as it is largely (more than 85%) used as edible food. Conformance to Codex Alimentarius (the international code of food safety) and HACCP (Hazard Analysis of Critical Control Points) are fast becoming urgent issues to be addressed for many food manufacturing outfits.

Palm oil mills and refinery would have to subscribe to the same criteria eventually. Issues of concern include pesticide use and residue, contamination during processing, transport and storage. While some industry members in Malaysia may be grappling with the issue, we ourselves must not waste time to argue over the rationality of the matter but work very quickly towards achieving the HACCP based food safety standards in all our Group mills, building on the earlier effort on ISO 14001 EMS. The various critical points in palm oil mill where potential hazards needed attention have already been analyzed and detailed by the Food Safety Working Committee of MPOA (Malaysian Palm Oil Association). Essentially mills would have to use stainless steel and vegetable based lubricants instead of petroleum based lubricants in all machinery likely to be in contact with palm oil. Anything that is required of the mills and estates must be timely installed or internalized as part of the operational system.

The market out there is not giving the excuse to anybody who is ignorant and/or un-informed on this onslaught of the 'tsunami'. It would serve us well to remember that there is such a variety of alternatives to palm oil on the international vegetable oil markets. Therefore, we should move beyond the compliance of national regulatory regulations. Our pro-active response to the new values of market place will safeguard our competitiveness.

Food and its ingredients need to be traceable throughout the entire food supply chain under the farm-to-table concept. With the passing of the Regulation (EC) 178/2002 in the European Parliament, the issue of traceability will soon become a potential 'hurdle' in the European market commencing from 2005. Little do we know the practical mechanism of traceability at this stage? The onus is on us to find out more information on this matter. The 'ostrich syndrome' of sticking our head into sand by ignoring the call for compliance should not be our approach on this issue.

We must commit ourselves to GAP and influence others at the national level to do likewise. There must be commitment and close cooperation across the chain to ensure GAP outcomes flow through to each sector of the industry. It is in fact timely for our involvement with industry members to engage NGOs and other stakeholders in the palm oil supply chain on the issue of sustainable palm oil production and uses. Both Kulim (Malaysia) Berhad and NBPOL have taken

a progressive stand and are now members of the Roundtable for Sustainable Palm Oil (RSPO). Asia Green Environmental Sdn Bhd, an associate company of Kulim, is an affiliate member. RSPO is a business engagement among multi-stakeholders of the palm oil value chain focusing on sustainable palm oil production and use. The real challenge before us now is to ‘walk the talk’ lest we become a black sheep in the flock.

It is a common perception that implementing GAP increases costs, and there is a tendency for second or third party auditing to be perceived as intrusive and unnecessary. One must bear in mind that increasingly auditing applies not only to agriculture but to most industries around the world.

The commitment of the company at senior executive level is vital, and the actual implementation of GAP/BMP at the operational levels is just as important. Details on Kulim’s effort in achieving sustainable palm oil will be presented by Mr. Ong Kim Pin in this conference. What is crucial at the present juncture is to communicate to all levels of employees in the company on our mission to be a socially responsible corporate citizen, targeting for causing minimal environmental footprint while at the same time integrating food safety management system in the conduct of our business.

Notwithstanding the above, the onus is on our part to remain vigilant on any emerging sign of concealing trade issue as an environmental issue. The industry as a whole would not want to see a proliferation of standards that could become trade restrictive. Whatever we should accept, be it EUREGAP (European Retailer Fresh Produce Working Group Good Agricultural Practice) or Malaysian own standards (to be formulated) would be a national issue to be discussed by the industry members.

Global Trade Framework of WTO

The newly concluded global trade framework of WTO is giving developing countries the chance to realize their comparative advantage in agriculture in exchange for goods and services from developed countries. Under this accord, export and production subsidies on agricultural produce are either to be eliminated or limited in developed countries. Import tariffs are also to be cut in industrialized countries to remove the protectionist policy on trade that is meant to safeguard the efficient farmers. The eventual realization of this global trade agreement, which will take at least several years from now, will either be neutral or further enhance the competitiveness of palm oil among the oils and fats.

We must not assume, however, that both USA and Europe will not explore other options in sustaining their production of annual oilseeds. A case in view is the rapid expansion of soy bean cultivation in Brazil by American investor.

Marketing of Palm Products

Marketing decision has a tremendous impact on the profit margin of our palm products. A misjudged decision could indirectly jeopardize all the efforts in reducing cost at the production/processing front. Suffice for me to say that the right person(s) for the job is key to a bigger profit or a smaller loss!

CONCLUSION

2003 was a rewarding year for the company and employees. The good half yearly performance of 2004 is giving us an optimism that we may end the year with even better financial results.

While we are zeroing in on our yield per unit area and oil extraction rates, we must also change our mindsets from a commodity mentality to a food product mind. Following on the above, GAP, CODEX, HACCP, etc need not be viewed as external imposition but opportunity to become a more rigorous producer of sustainable palm oil. It would not be surprise in the near future that GAP requirements will no longer be voluntary but mandatory.

Our membership in RSPO is a first step in the right direction. At this transition stage numerous challenges are before us as we continue to soldier on the path of sustainable growth. It is crucial for all our executives and staff to be well informed of the new demands with respect to the triple bottom lines while at the same time the company must put in place a strategy to enhance the human capital in meeting the challenges ahead. I am confident that Kulim's palm oil business in Malaysia will continue on the path of sustainable growth albeit less in plantation sector but more in oleochemical sector.

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**Table 1 : Summary of Mechanisation and Other Field Works
In 2002 & 2003**

	Kulim Group		EPA Group	
	2003	2002	2003	2002
Kulim System of Crop Evacuation				
Total Crop Evacuated (tons)	300,460	282,993	658,381	604,647
Tons/Vehicle/Day	62.95	66.02	54.95	52.61
Cost (RM/ton)	6.48	7.25	6.59	7.26
MB System of In-Field Collection				
Total Crop Evacuated (tons)	404,853	349,642	958,317	836,203
<u>Productivity :</u>				
i) Tons/machine	10.63	10.01	10.51	9.69
ii) Tons/manday	2.09	2.06	2.07	2.04
Cost (RM/ha)	1.91	1.99	2.05	2.18
<u>Deficit in Recovery</u>				
i) Total (RM)	237,177	239,941	656,976	687,797
ii) RM/ton	0.59	0.69	0.69	0.82
Fertiliser Spreader				
Area Covered (Ha)	87,346	86,145	193,775	194,943
Cost (RM/ha)	3.51	3.51	3.52	3.52
POME Application				
Area Covered (Ha)	3,874	3,807	11,581	10,499
Productivity (Ha/tractor/day)	3.24	3.76	2.70	2.87
Cost (RM/ha)	35.78	27.62	33.85	31.08
EFB Mulching				
Area Covered (Ha)	3,267	2,543	7,736	6,171
Cost (RM/ha)	336.14	369.02	314.98	347.80
Circle Spraying				
Area Covered (Ha)	61,977	66,938	123,690	135,886
Productivity (Ha/manday)	4.75	4.57	4.88	4.92
Cost (RM/Ha)	13.69	13.94	13.06	12.90
Selective Weeding				
Area Covered (Ha)	50,725	51,060	108,451	112,165
Productivity (Ha/manday)	4.80	4.55	4.74	4.67
Cost (RM/Ha)	16.73	17.11	16.56	16.70
Rotoslashing of Paths				
Area Covered (Ha)	50,573	45,959	112,027	108,446
Productivity (Ha/day)	35.92	36.02	35.69	34.95
Cost (RM/Ha)	1.91	1.87	1.84	1.84

Table 2 : Performance of Buffalo Assisted Harvesting & Evacuation

Estate	MUTIARA		TEREH SELATAN	
	2002	2003	2002	2003
No. of Buffaloes	44	43	56	42
Area Covered (Ha)	39161.82	32996.69	42344.75	30064.29
FFB Evacuated (tons)	30453.15	29040.63	29319.67	25001.33
<u>Productivity</u>				
(i) Tons/Harvester	2.23	2.26	2.16	2.50
(ii) Ha/Day/Animal	2.87	2.57	3.12	3.00

Table 3 : Kulim's Costs of FFB Production and Milling

	FFB Production Cost (RM/Ton)	Processing Cost (RM/Ton)
2002	116.37	24.02
2003	105.27	23.82
2004 (Jan-July)	137.82	28.48

Table 4 : Summary of Monthly Shortages of Harvesters and Field Workers

		KULIM GROUP		EPA GROUP	
		Harvester	Field Worker	Harvester	Field Worker
2003	Yearly Total	211	617	1052	1073
	Monthly Mean	17.6	51.4	87.7	89.4
	Range	+3 to -49	-15 to -78	-52 to -163	-60 to -159
2004 (Jan-June)	Half Yearly Total	84	201	719	454
	Monthly Mean	14.0	33.3	119.8	75.7
	Range	+3 to -33	+10 to -77	-32 to -192	+29 to -168

**Table 5 : Effect of Increase in Harvester's Productivity
On Harvester's Earning and Cost of Harvesting**

	Conventional Harvesting	
Yield Bracket (t/ha)	17 – 25	> 25
Harvester's Earning (RM/Day)		
@ 1.5 t/mday	41.32	39.99
@ 2.5 t/mday	64.38	62.09
% Increase	+ 55.8	+55.3
Cost of Harvesting (RM/ton)		
@ 1.5 t/mday	27.55	25.75
@ 2.5 t/mday	26.66	24.84
% Decrease	- 3.2	- 3.5

	MB Harvesting	
Yield Bracket (t/ha)	17 – 25	> 25
Harvester's Earning (RM/Day)		
@ 2.0 t/mday	49.54	47.95
@ 3.0 t/mday	70.88	68.53
% Increase	+ 43.1	+ 42.9
Cost of Harvesting (RM/ton)		
@ 2.0 t/mday	24.77	23.97
@ 3.0 t/mday	23.63	22.84
% Decrease	- 4.6	- 4.7

Note : Based on price zone of RM1200 – 1300/ton CPO

Fig.1 : Kulim's 10-Year Trend On Cost Of FFB Production At Estate Level

