AA RESEARCH NEWS

Oct 87

EDITORIAL

The long awaited big event to the oil palm plantation community, the International Oil Palm/Palm Oil Conferences has come and gone. It was a solid 3–4 days (and more for some) of back-breaking and mind-taxing vigil of endless presentations, discussions and rich meals, but made bearable by some side distractions and camaraderie spaced in between. Conferences such as these are the usual occasions in which individuals and companies involved with the palm oil industry throughout the world, try to project themselves in their presentations and discussions, to exchange ideas and experiences, and to renew social and professional contacts. For **planters**, the Conferences are opportune occasions for them to get away from their daily work routine, to share their experiences with their counterparts and researchers from other organisations, to acquaint themselves with the recent technological developments in the oil palm industry world-wide and then to return home refreshed and eager to try new ideas. The Conferences are therefore a stimulating interaction of **planters** and **scientists** which play a vital part in the presentation and testing of new ideas and experiences and which, undoubtedly, have played a major part in providing the technological base for the tremendous expansion of the industry over the past decades.

It was a pity therefore that this recent Conferences was not as well attended by **planters** as previously. This could possibly be due to the increasing dominance in presentation and participation by specialist **scientists** and **researchers**, a sign of the technological evolution and progress of the crop. The high registration fees and costs of attendance have also discouraged companies from sending too many delegates. In earlier Conferences, some **managers** even paid with their own money to attend but with the current high cost, they would be reluctant to do so. Perhaps the organisers should keep this in mind and find ways eg. less expensive venue, less days, less elaborate meals, less expensive preprints, etc, to trim down the cost next time to encourage more attendance. Attendance and participation by **planters** is vital to the success of these Conferences as they form the backbone of **managers** in the industry and take the major decisions in assessment of viabilities of new ideas and practices.

Participation by **scientists** has perhaps become increasingly too dominant and the Conferences have veered too much away from the original Planters' Conference. So much so that **planters** find the language used by the **scientists** way beyond their comprehension while the deliberations in the practical management sessions would not interest all the scientists. Perhaps a way to get around this is to reorganise the presentations into a main session for general audience, devoted to broad overviews on important topics and subsequent concurrent scientific and management sessions for more specialised presentations and discussions. This would reduce the number of highly specialised sessions to the general body and enable freer and more meaningful discussions among specialists. However, there is another school of thought which maintains that the main decision makers i.e. the **planters**, should be allowed to sit in all the deliberations of interest to them. It is usually not difficult to follow the gist of even the most scientific papers and most **planters** nowadays have been trained in the sciences. The answer probably lies in a proper balance of the papers and topics and to cull out the highly specialist ones of little immediate direct relevance to the industry. And, of course, **planters** can help resolve this problem themselves by encouraging and their counterparts to present papers of interest to **planters**. The TPSB Managers' Conference in July was a good example of what can be done.

This issue of the Newsletter is devoted mainly to highlighting some of the relevant papers presented at the Oil Palm Conference and to discuss their findings in relation to our field planting practices.

INTERNATIONAL OIL PALM CONFERENCE (Organised by PORIM/ISP 23–26 June, 1987)

Highlights

A. Oil Palm Yield Forecasting

Chow Chee Sing of PORIM, in his paper, 'The Seasonal and Rainfall Effects on Palm Oil Production in P. Malaysia' showed that the variations in crude palm oil production in P. Malaysia can be reasonably explained by a statistical model. The model takes into account:–

- the trend of changes in production level due to changes in oil palm planted hectarages as well as age structure of the mature areas;
- seasonal yield oscillation or cycle;
- lagged rainfall (rainfall at various months before current harvest);
- lagged yield (FFB or fresh fruit bunch yield at various months before current harvest).

The results indicated that:

- the seasonal yield variation was not directly related to the rainfall pattern and probably follow an endogenous (inherent natural) cycle;
- the lagged rainfall of 20–24 and 7–11 months before harvesting, which are the crucial periods of sex differentiation and floral abortion respectively, have marked positive influence on the yield;
- the lagged yields at 12–13, 24–25 and 36 months before harvesting, have significant negative effects on the yield.

The model is being used fairly satisfactorily for yield prediction at the national level by PORIM. Earlier work on yield prediction at the estate level by PORIM using the same model, showed that the predictions were less accurate. However, PORIM is currently making improvements on this model.

B. Cost of Palm Oil Production in Major Producing Countries

Prof. Tan Bock Thiam evaluated the cost of palm oil production by means of a computer model. Analysis showed that for Malaysia the main components of production cost were capital (30%), fertiliser (25%) and labour (21%) (Table 1). The long-run cost (including capital costs) showed that Malaysia was the lowest cost producer at US$205 per tonne oil with Indonesia the highest at

HIGHLIGHTS

- 1987 International Oil Palm Conference
- Revised International Notation for Exploitation Systems in Rubber
- Taiko Plantations Managers' Conference
- Urea-Tech 1987

Table 1: Cost structure for palm oil in major producing countries (US $/t CPO)				
Item	Malaysia	Indonesia	Thailand	Ivory Coast
Capital	61.7 (48.8)	125.6	81.4	88.7
Fertiliser	51.0 (44.8)	53.5	53.8	26.1
Labour	43.8 (41.8)	22.9	48.2	43.8
Others	29.3 (33.4)	19.0	22.2	42.0
Net processing	19.3 (10.9)	21.0	23.3	21.0
Long-run cost	205.1 (179.7)	242.0	228.9	221.6
Short-run cost	143.3 (131.0)	116.4	147.5	132.9

( ) Plantation sector

Table 2: Reducing Cost of Palm Oil Production (% reduction in cost of production)		
Method	Plantation	National average
10% increase in extraction rate	9.1	8.9
10% increase in yield	8.5	8.2
10% reduction in processing and transport cost	3.5	3.5
10% reduction in capital cost	2.9	3.3
10% reduction in fertiliser cost	2.9	2.9
10% increase in labour efficiency	2.3	2.2

A 10% increase in extraction rate or 10% increase in yield will reduce cost of production from 8 to 9% compared to less than 4% for the other factors.

US$242. This was due to the high interest rate (21.5%) in Indonesia and the high infrastructure cost of US$400 per ha in developing new areas. The short-run cost on the other hand was lowest in Indonesia due mainly to its low labour cost (US$1.50 vs US$4 40 per man-day for Malaysia).

In evaluation of changes in cost resulting from changes that major variables, it was found that the two important factors were extraction rate and yield (Table 2).

C. Breeding, Selection and Clonal-testing

To many planters (and even some agronomists) in the audience the papers presented in this section of the conference tended to be rather specialist-inclined. Nevertheless there were some papers of general interest to all of us who are involved in the improvement of the production and marketability of the crop.

Oil Quality.

Palm oil is composed of roughly equal proportions of saturated and unsaturated fatty acids of oils. Because of the popular misconception of the "association" between predisposition to heart diseases and a high saturated oil diet, which is rather entrenched in the minds of the consumers in affluent societies; and that palm oil because of its relatively higher saturated oil content, tends to "cloud" or solidify in the temperate countries, making it difficult to penetrate the salad oil and cooking oil market, palm oil exporters and end-users have been urging breeders to breed for an oil palm variety which produces higher content of unsaturated oil. To be able to breed, there must be genetic variation. Unfortunately genetic variation for oil composition is rather low or limited in current advanced oil palm breeding materials. From his inheritance studies on oil composition characteristics in the "semi-wild" Nigerian prospected materials, Arasu *et al.* addressed this whole issue.

There is indeed wider variability for oil quality traits in the Nigerian materials but unfortunately their heritabilities (proportion of differences attributed to heredity) are still rather low, making breeding a difficult and slow process. They found that there is sufficient genetic variation within the *Guineensis* species to breed for palms which produce oils having 65–70% unsaturated oils but to achieve the level of unsaturation approaching that of olive oil (80%), *Oleifera x Guineensis* hybrids need to be resorted to. Unfortunately the oil yielding capabilities of OxG hybrids are lower than those of current DxP due to partial sterility.

The authors cautioned against hasty decisions to embark on a large breeding programme (which is a slow process) to change the composition of oil in the oil palm to suit unpredictable consumer preferences especially in the light of recent findings that the present composition of palm oil can confer beneficial effects on human health when consumed. There is a case, however, to be made for improving the liquid content of palm oil to penetrate the salad oil and frying oil markets. Even then the authors suggested that instead of changing the current breeding programme which is aimed at improving oil yield, a separate, if not limited, programme to improve oil quality may be advisable.

Fertile Pisiferas

Fertile pisiferas can have two advantages. If they are completely fertile, they can be planted in commercial plantations which would enable higher oil yields to be obtained because of the absence of shell in the fruits. Alternatively, in breeding and DxP seed production, fertile pisiferas (because they produce bunches) can be selected on their own merit instead of relying on information from the tenera sibs (which is less reliable) or from the actual DxP progey-test (which has to await another generation) when using sterile pisiferas. Chin of FELDA reported the results of these two aspects of their fertile pisifera breeding work. Although the average bunch yields of individual fertile palms in their pisifera x pisifera progenies were comparable to those of DxP materials, none of the progenies was fully fertile. The best which they could achieve was 95% fertile palms in the family which made these materials not quite ready for use as commercial planting materials. Also in DxP progeny tests, these fertile pisiferas imparted a thicker shell to their offsprings, consistent with earlier experiences with fertile pisiferas in W. Africa and Malaysia. Unless one can faithfully clone high yielding fertile pisifera palms, further breeding work involving other sources of fertile pisiferas will be necessary to achieve fertile pisifera materials.

Oil Palm Clones

Soh, of AAR, had earlier suggested that the oil yielding potential of the first clonal palms resulting from yield selection would likely to be around 13% better than current DxP materials, instead of 30% popularly presumed. In his conference paper, he reexamined the results of selection based on a combination of supporting yield component traits eg kernel to fruit, mesocarp to fruit, bunch number, besides oil yield in the form of a selection index which would be more heritable instead of just oil yield, which is less heritable. Indeed, index selection would be more efficient, but the expected quantum improvement would still be much less than the projected 30%. This is because of the fact that current DxP materials are already rather genetically uniform.

Corley's paper on the field testing of clones in fact supported Soh's prediction. He admitted that with high yielding genetically uniform materials, large quantum yield jumps from the clones derived would be not likely and that only with more tests of more clones derived from more genetically diverse materials would the 30% improvement be possible. But 30% better than what? It should be 30% than the best DxP available then, (rather than at present), because by the time the best clones are confirmed, newer higher yielding DxP materials would also be available.

From his experience in clonal tests, use of commercial DxP materials as a control treatment to compare with the clones, is inadvisable. Because of the small sample of seeds drawn, it is difficult to get a representative sample. Standard high yielding clones and standard high yielding DxP crosses will serve as better control treatments. Corley stressed the need for 5 years or more yield data with clonal trials to average out differential clonal responses to climatic influences and of multilocational trials because different clones might be adapted to different locations. However, with so few clones being tested todate, perhaps it is too soon for him to come to such firm conclusions. Corley also tried to rationalise the levels of cost of clones with the respective expected yield improvements. But this would seem a premature exercise to most people unless the risk of abnomalities in clonal palms can be solved, although, Corley was confident that Unilever would overcome this problem.

The paper "In Vitro Vegetative Micropropagation of Oil Palm: choice of strategy of results" by IRHO group of Duval, *et al.*, discussed the IRHO strategies to minimise occurence of off-types and clonal testing procedures. The paper took great pains to emphasize that the French have adopted a new method of propagation through proliferation of embryoids in the absence of hormones as opposed to their previous method of proliferating calluses and embryoids using high rates of such substances. Their test results were still very preliminary but so far no abnormalities occured on clones from their current method as opposed to the previous method which gave abnormal palms. Further tests would be necessary to confirm the clonal fidelity of their current technique.

D. Ripeness Standards and Harvesting Criterial for Oil Palm Bunches

This paper by Rajanaidu, *et at.* is basically a review paper, reviewing the latest findings on this subject. Rajanaidu and friends recommended that the harvesting standard should be based on at least 1 loose fruit per bunch on a 7–10 day harvesting round. With this standard, good quality oil with low FFA (free fatty acid) and reduced harvesting costs through minimal loose fruit collection would be ensured. The envidence for this firm conclusion was not equivocal as evidenced by the deluge of queries from the audience. Obviously the last word on this issue has yet to be spoken.

E. Agronomy and Nutrition

1. *New Techiques in Irrigation and Management of Palm Nurseries*

The paper by Ramli Abd. Majid & Duckett described the use of a 'new' method of irrigation of nursery palms in polybags. The system uses the "Sumisansui MkII Perforated Tubes" (marketed by ACM) which are particularly suited for low-water pressure situations. The tubes work over a water pressure of 0.2 to 0.8kg/cm^2. Higher pressure may damage the tubing.

Although the system described was used satisfactorily for a 25 ha nursery, it would probably be most advantageous for smaller, short-term nurseries of two to three years as the initial investment is low (quoted at $3178 per ha against $11,293 per ha for the conventional PVC pipe overhead sprinkler system).

The system is easy to install, requires a low amount of water, and there should be less splashing and compaction of the soil surface resulting in reduced fertiliser losses.

Potential problems include blockage of the irrigation tube holes by soil, etc, displacement of the tube by wind and possible uneven distribution due to blocking of spray by the palm fronds if there is inadequate spacing for the irrigation tubes.

Managers involved in setting up new oil palm, rubber or cocoa nurseries should consider the merits of this system as opposed to conventional techniques.

2. *Reclamation of Mangrove Swamps for Oil Palm Cultivation*

Toh Peng Yin, *et al.*, clearly presented an effective desalinization approach to reclaiming mangrove swamps. The soil conductivity of the area must be lowered to < 2.0-millimho/cm before it is considered suitable for planting while at the same time the soil acidity should be well controlled through proper water management practice. Thus flushing of the fresh mangrove swamps, to remove the excess salts, using rain water, have to be initiated 2–3 years ahead to condition the soil for field planting. This method of reclamation could be useful for estates with areas of similar conditions.

3. *K in the Oil Palm Ecosystem and Some Implications to Manuring Practice*

Through a series of destructive palm samplings in a number of trials, Teoh and Chew of AAR studied the distribution of K in the various components of the oil palm ecosystem on five soil series. They found that soil and palm K levels were high on coastal clay soils. This explained the general lack of yield response to K fertilisation in this soil.

They concluded that probably only minimal amounts of K fertilisers will be required on these soils except perhaps in the early years when the K demand is high.

For inland soils, soil K levels were generally lower but well manured palms had comparable K contents as those on coastal clay soils. Due to the lower soil reserves, yields may be reduced if K manuring is omitted for over two years. The study suggested that at times of high fertiliser prices and/or low palm oil prices, K manuring can be reduced for up to two years for well manured fields on inland soils with little effects on FFB yields.

There is generally high K reserves, equivalent to about 2.8 t/ha MOP, in the oil palm (mainly in the trunk) at the time of replanting. Replanting techniques should be geared to tapping the K reserves valued at about $840/ha.

Inter-row covers did not immobilise appreciable amounts of K. Thus except for tall woodies and a limited number of noxious weeds, ground covers should be encouraged to reduce loss of nutrients through soil erosion and runoff.

4. *Zinc Nutrition of Oil Palms on Peat Soils*

Although copper deficiency is more commonly associated with peat soils, this paper highlighted another major disorder (peat yellows) of oil palm on peat, especially where peat depths exceed 1m. Gurmit Singh in his paper showed that the disorder was due to zinc deficiency. Spraying with zinc sulphate at 1,000 ppm Zn at 6 monthly intervals was effective to correct any peat yellows on peat. Recovery was reported to be quick, within 3 to 6 months. Foliar spraying was most effective compared to trunk injection or soil application. Yields of up to 31 t/ha was reported for six year-old oil palms on peat soils after zinc spraying.

5. *The Effect of Fertilisers on Oil Bunch Components in Peninsular Malaysia*

This paper by Foster, Tayeb and Singh showed that KCl fertiliser significantly depressed oil content of bunches for inland soils. Application of N fertilisers reduced this effect. In contrast KCl applications increased oil content of bunches of palms on coastal soils.

The decrease in oil content on inland soils was partly compensated by an increase in kernel weight and the modifying effect of N fertilizers. Thus, the estimated profitability of fertiliser applications on inland soils was much the same whether optimum rates were determined from FFB or oil + palm kernel data. On coastal clay soils the profitability of fertiliser responses was much greater than expected from the FFB data alone.

1/2 V ↑ + 1/2 d/4 6/7
one half V cut tapped upwards and one half spiral cut downwards both tapped on the same day on fourth daily tapping six days in seven.

1/2 Sd/2 4m/12 –– 1/4S ↑d/2 8m/12
a half spiral cut tapped downwards alternate daily for the first four months changed to a quarter spiral cut tapped upwards alternate daily for the next eight months.

Panel Notation

Panel notations are not included in a tapping notation but should be indicated in tapping descriptions or treatment details. Panels located above the height of the first opening are called the high panels denoted by the letter 'H' and panels formed below, base panels denoted by 'B'. Virgin panels are denoted by 'O', first renewed panel by I and second renewed panel by II.

Examples,

BO–1
the first cut in virgin bark of the basal panel

BI–3
the third cut on first renewed bark of the base panel

HO–4
the fourth cut on virgin bark of the high panel

Some panel notations are illustrated in Fig. 1 below.

Stimulation Notation

This encompasses active ingredient, method, periodicity, number of applications per period of stimulation.

Examples,

ET	=	ethephon
ET 10%	=	stimulated with 10% of ethephon
Pa	=	panel application
Ga	=	groove application
8/y	=	eight applications per year

Complete examples,

ET5% Pa.8/y (m)
stimulated with 5% ethephon, panel application eight times a year applied at monthly intervals

ET10%. Ga.16/y (2 w)
stimulated with 10% ethephon, groove application sixteen times a year applied at two weekly intervals.

Stimulation notations are always presented together with tapping notations with an appropriate full stop inserted between them.

Examples,

2 x 1/2S ↑↓ d/4 6d/7.ET10% Ba.4/y (2m)

Two one half spiral cuts, one half spiral cut tapped upwards and the other half spiral cut tapped downwards, both tapped on fourth daily 6 days out of seven and stimulated with 10% ethephon applied on scraped bark four times a year at bimonthly intervals.

General

The Revised International Notation appears to be a useful abbreviated scheme covering the various exploitaion systems in Hevea.

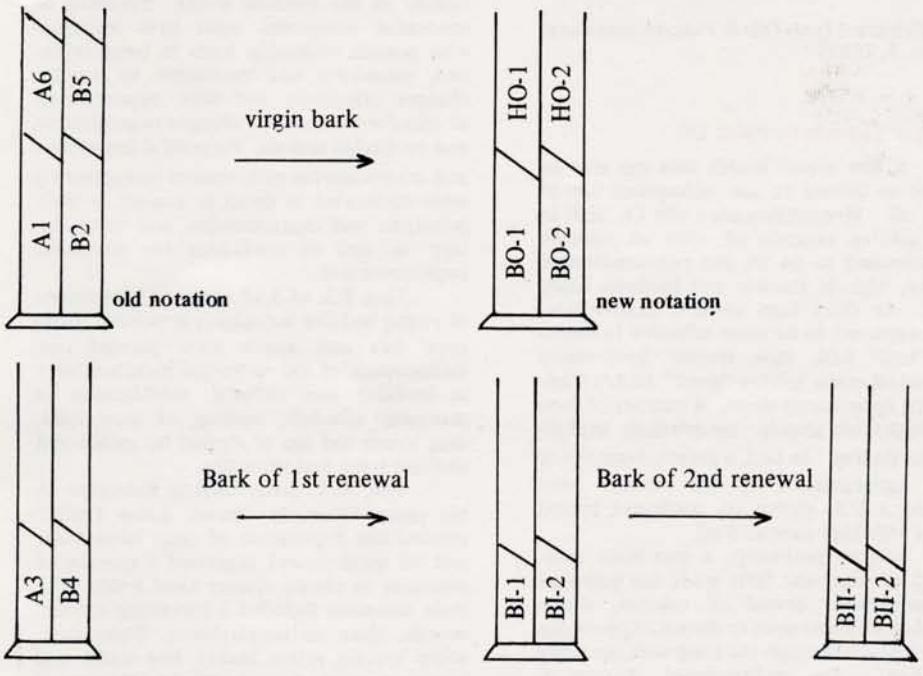

Fig. 1 Notations of panels

Chan, W.H.

COMMODITY NEWS

Rubber

Natural rubber bounces back

1. Sustained increases in demand for NR have pushed world prices of NR to their highest levels since 1981, enabling INRO to offload some of its buffer stock onto the market for the first time. The Malaysian rubber market closed at **$2.64** in October (RSS 1). compared against **M$2.00** five years ago (the price was **M$3.12** during the industry's last bountiful year in 1980).

2. Rubber traders expect the firm price to continue. Brokers are divided as to the underlying causes for the improvement in the price. However, all agreed that there has been a shortage of physical rubber since June 1987. The growing tension in the Persian Gulf lends further support as sellers are cautious in their commitments.

3. The London-based Andrew Commodities reported that shortage in physical rubber became apparent in June when increased demand from Japan was followed by similar increases from South Korea, Taiwan, China and Soviet Union. The East Asian markets' movements seemed to have been followed by a corresponding increase in demand from the West. In particular the major tyre manufacturers appeared to have finished destocking and were actively looking to replenish their inventories.

4. Malaysia, Indonesia, Thailand accounted for more than **75%** of the **4.4** million tons of NR produced in the world in 1986. Thus any disturbance of normal production would have a noticeable effect on the market. The current NR shortage is said to have been caused by reduced production in Thailand due to rain and in Indonesia due to drought. Drought was also reported to lower China's production this year.

5. It appears that the AIDS-engineered boom in condoms and clinical gloves could have caused the strong and continued demand for latex concentrate which then resulted in reduced material for the production of dry rubber. Industry analysts however warn against expecting too much from this AIDS-latex equation, as latex makes up only **7%** of NR consumption, and a 10% increase in latex demand is a drop in the bucket of total elastomer product market.

6. Much more significant in the long term are fundamental changes in international tyre industry, by far the largest consumer of both NR & SR. About **70%** NR usage goes into the transportation industry either in tyres or other automobile parts. Until a few years ago, the trend was to use more SR in the lighter tyres used for passenger cars, while heavier tyres for trucks or aircraft used more NR. But tyre makers around the world are now switching from cross-ply to radial tyres, which uses more of NR. It enables them to perform better.
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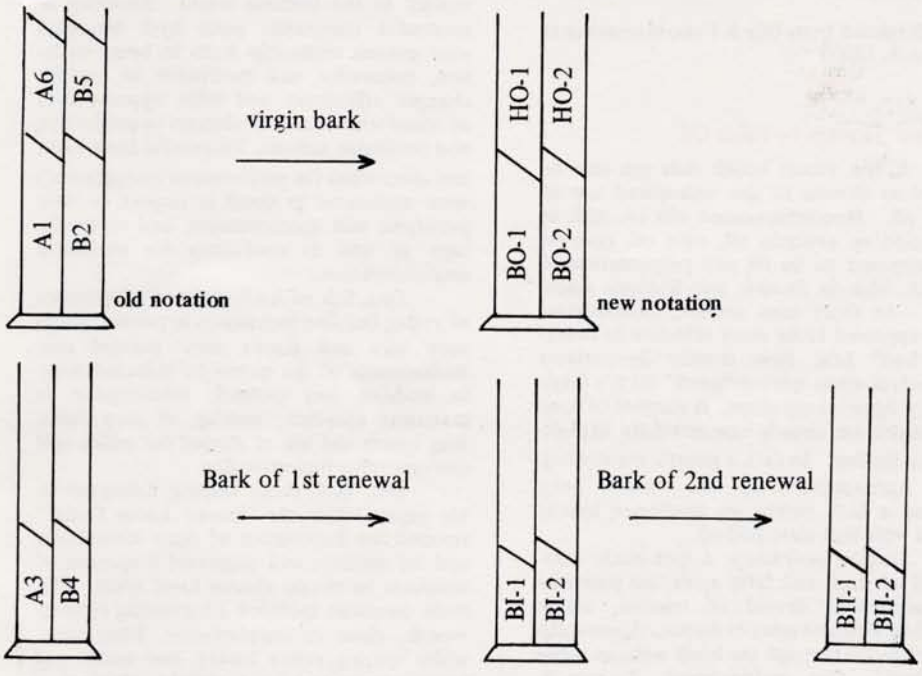

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unique niche in the elastomer market, where for technical reasons, SR cannot be substituted. In this respect NR price is not likely to be affected by petroleum or SR price. Indeed some industry analysts say that the market share of SR may soon shrink to a limit of about two-thirds of the pie. NR is climbing back from a low of **29%** and trends indicate that it will have secured 35% of the elastomer market by early 1990s'

7. The introduction of epoxidised rubber, which has similar attributes to SR, has also increased NR's competitiveness.

8. The entire world market for elastomer is also expected to grow by a healthy 3% per year in the next five years.

9. It is fast becoming clear in fact that NR from *Hevea brasiliensis* is well-rooted in the world economy.

Extracted from:
Far Eastern Economic Review 29.9.1987
Asiaweek 9.10.1987
Investors Digest October 1987

Palm Oil

Production . . . + Prices

Estimated 12 months to September 1987

Type of Oil	Production	Consumption	Price (monthly average) in US$/tonne			
	('000 tonnes)	('000 tonnes)	1984	1985	1986	1987 (till July)
Soyabean	14903	14564	726.0	571.2	346.3	348.0
Palm	7422	7595	731.8	504.8	262.1	340.0
(Olein)			(787.5)	(549.8)	(329.0)	(349.0)
Sunflower seed	7189	7236	769.2	603.4	373.8	399.0
Rapeseed	6891	6940	687.3	540.5	308.0	311.0
Cottenseed	3117	3221	846.2	714.3	495.9	515.0
Groundnut	3329	3173	1015.5	913.6	578.2	515.0
Coconut	3060	3343	1154.6	590.2	295.7	497.0
Palm kernel	987	1006	1038.5	556.7	287.7	470.0

(from Oils & Fats International No. 3. 1987)

The Proposed EEC Tax on Palm Oil Imports

Since the early 1980's, farmers in the European Economic Commission (EEC) countries, because of surplus in the grain market, have been encouraged to switch to oilseed cultivation by generous price supports. Presently the prices guaranteed to rapeseed farmers are three times higher than the world market price, while the subsidies given to sunflower and soyabean growers are about two and a half times the world market price. Is it any wonder that the EEC is facing a surplus in oilseed production and a huge burden in cost of subsidy? In 1977, the cost was about **US$2.3 million**, this year is about **US$2.5 billion** and in 1990's it is anticipated to be about **US$4.5 billion!**

Because of this huge financial burden, the Commission seeks to share the burden with producers and consumers by levying a tax on refined oil as it leaves the refinery. If put into effect the tax would be about **US$375** per tonne! According to the Commission the tax would be nondiscriminatory as the tax would be imposed on all oils imported or produced in the Community. However as Malaysia exports mainly refined palm oil to the EEC countries it has to bear the tax. Secondly, the tax is discriminatory because the EEC producers recover the tax in the form of subsidies, but this is not so for producers in the oil exporting countries. In fact it can be likened to "robbing Peter to pay Paul'.

Many of the EC traditional trading partners in oils and fats, i.e. US and Third World countries including Malaysia, strongly objected to the tax proposal and are considering strong retaliatory measures if the tax is adopted. In fact, same EC members eg. W. Germany, U.K. and Denmark strongly resisted the proposal.

Decision on the tax proposal was again postponed till the December meeting.

(Extracted from Oils & Fats, International No. 3, 1987)

Further Threats to Palm Oil

A few recent health fads can also be viewed as threats to the widespread use of palm oil. Monounsaturated oils i.e. high in oleic acid eg. avocado oil, olive oil, corn oil are supposed to be IN and polyunsaturated oils i.e. high in linoleic and linolenic acids, OUT. In short term studies, monounsaturates appeared to be more effective in lowering "bad" LDL (low density lipoprotein) cholesterol while leaving "good" HDL's (high density lipoprotein) alone. A number of food companies are already commercially exploiting the finding. In fact, a genetic engineering firm, Agrigenetics Corp. has recently been granted a U.S. patent on sunflower hybrid plants with high oleic acid oil.

Sucrose polyesters, a man-made compound of sugar and fatty acids, are potential fat substitutes devoid of calories, which would be welcome news to dieters. Apparently this oil passes through the body without being absorbed. The multinational, Proctor & Gamble Co., will be marketing it as **olestra** which will be used in cooking oil, salad dressing, mayonnaise, milk shakes, potato chips.

Cocoa

Malaysia has become the 4th largest producer of cocoa in the world (after Ivory Coast, Brazil and Ghana) with a production of 150,000 t this year, constituting 7.7% of the total world output. Of this production 61% comes from Sabah. The present output is an increase of 14.5% over 1986 production, and for 1988, a further 10% increase is forecast with the expansion of cultivated areas. Owing to continued world oversupply, prices for the first nine months this year have dropped to M$4,403/t (average) as compared to M$4,743/t for 1986. Holland remains as Malaysia's biggest cocoa buyer, the others being Singapore, W. Germany and U.S.A.

1987 Taiko Plantation Sdn. Bhd. Managers' Conference

The Conference was held on July 24–26th, 1987 in Penang, with the theme **"Initiate, Innovate, Motivate"**. Six papers were presented, one from a guest speaker and the others from TPSB/AAR personnel.

TPSB Chairman, Mr. Lee Oi Hian in his opening address complimented the Managers' on the reasonably good profit recovery for the first half of 1986/87. However he reminded them of the difficult times in 198 when palm oil price was a record low and warned of possible turbulence and competition of our produce in future. Against such a scenario, the only strategy to adopt was one of lowest costs and high standards of quality and reliability. He emphasised that all involved must commit themselves to act on this strategy by achieving targets for yields and costs i.e. rubber at **1900 kg/ha, $1.10/kg;** oil palm at **24 t/ha, $60/t;** cocoa at **1.2 t/ha, $2.20/kg,** palm oil extraction at 21% minimum and 6% kernel. Rubber quality must meet consumers' specifications. He commended the Managers of the positive trend in the group towards high agricultural standard, higher yields, better extraction rate and quality improvement. Some leadership traits were highlighted and he noted that some of these traits were being increasingly practised by Managers to get committed teams into action.

The guest speaker, Mr. W. Solubub of Bard Sdn. Bhd. spoke on the Conference theme "Initiate, Innovate, Motivate". According to him, changes are taking pla rapidly in the business world. Surviving or successful companies must have Managers who possess leadership traits in being initiative, innovative and motivative to manage changes effectively and seize opportunities or transform threats of changes to productive and profitable actions. Purposeful innovation and motivation (or performance management) were elaborated in detail in respect of their principles and characteristics, and methodology as well as conditions for successful implementation.

Ong, T.S. of AAR spoke on refinements of young budding techniques in rubber. Common do's and dont's were pointed out. Refinements of the technique included delay in budding and cutback, modification in manuring schedule, nicking of snag buds, snag length and use of *Atrinal* for earlier and uniform scion bud sprouting.

Lee, M.T. from Ladang Kekayaan in his paper "Towards Cleaner Loose Fruits" stressed the importance of clean loose fruits and oil quality, and suggested a number of measures to obtain cleaner loose fruits. The main measures included 2 harvesting rounds/month, clean circles/platforms, 3-tier sieve, wider spacing rattan basket, rear trailer and hopper sieves and hand picking. Mechanical vibrator at the mill and 3 harvesting rounds/month may be further improvements.

Lee, K.T. and Lim E.H. of Ladang

Paloh and K.K. S. Paloh respectively co-authored the paper entitled "Use of Anaerobic Sludge as Fertiliser". Initial work done in Ladang Paloh has shown that tanker application of anaerobic sludge was practical and costs were within reasonable limits. Recovery cost on capital outlay was expected within 4–5 years. Fields to be applied must be fairly close to the sludge pond, reasonably flat or undulating, away from water source and with good accessibility.

Leong H.K. of Ladang Fraser spoke on underplanting oil palm which was first tried in the estate in 1985. This method enabled considerable saving in replanting costs and time. However, more elaborate measures would have to be taken against the rhinoceros beetles which breed in the decaying trunks of the previous stand.

The last paper entitled "Sovereignity of Consumers" by Marketing Director, Ooi L. H. re-emphasised the call by the Chairman for high standards of product quality and reliability to meet consumers' specifications.

Ong T.S.

UREA – TECH '87

The International Symposium on Urea Technology and Utilization was held on 16–19 March 1987 in Kuala Lumpur. It was organised by the Malaysian Society of Soil Science and sponsored by Petronas. A total of 180 local and foreign participants attended the 3-day Symposium during which 6 keynote address papers and 28 technical papers were presented to cover the various aspects relating to usage of urea in crops, efficiency and amendments, research techniques and production technology of urea. The Symposium ended with a panel discussion to identify solutions that could be applied towards efficient management of urea in the humid tropics. Owing to unforseen circumstances, two papers from AAR by Chan Khoon San and Chew Poh Soon were withdrawn at the last minute to the great disappointment of the organisers, sponsors and all the participants.

Paper Highlights

Highlights of the various sessions containing new or useful information are summarised here.

Session 1. Urea: Current usage in agriculture

The latest forecast of the FAO/UNIDO/World Bank Working Group for the period 1986/87 to 1990/91 shows that the global surplus situation in fertiliser nutrients will remain as shown.

World balance of nitrogen, phosphate and potash fertiliser (million tonnes)

Nutrient	1986/87	1987/88	1988/89	1989/90	1990/91
N	+3.84	+3.81	+2.75	+0.79	–0.51
P205	+5.09	+5.46	+4.99	+4.12	+3.27
K20	+4.46	+4.08	+3.60	+2.81	$2.45

For nitrogen, an equilibrium is envisaged towards 1990 mainly because no major additions to the existing production capacity are expected to come onstream at the end of the decade. Latest World Bank projection for urea per tonne are 1988–US$150. 1989–US$190, 1990–US$230 and 1995–US$240.

Session 2. Urea in rice production

These papers dealt mainly on the experiences in China and the Philippines where it is estimated that current farmers' practices result in 60–70% N losses in lowland through ammonia volatilisation and denitrification. Data from these countries indicate that deep placement of urea supergranules (USG) is an effective means to reduce the losses but large scale implementation of this technique is hampered by the low availability and high cost of USG.

Other approaches for lowering N losses include lowering the content of N in floodwater, surface broadcast followed by irrigation on upland soil, use of nitrification inhibitors and optimising the rate and timing of application.

Session 3. Urea and plant

Most standards for urea limit the biuret content to less than 0.5% since biuret is considered toxic to plants. However, work in Indonesia showed that for soil application, urea containing 7% biuret at a rate of up to 135 kg N/ha did not decrease crop production. However, for application in foliar spray, urea with a biuret content of less than 0.5% to 7% damaged the leaves and caused a decrease in production. The implication of higher biuret content in urea is lower manufacturing costs.

Session 4. Urea: Reaction in soil

The papers dealt with urea transformations in Malaysian soils and volatilisation loss from flooded rice fields. The results from the urea transformation studies were obtained by aeration with moist air which may explain the very rapid hydrolysis rate of 12 hours while the normal rate is 2–3 days. Studies of volatilisation loss from flooded rice show results similar to those obtained elsewhere, the major loss mechanism being denitrification.

Session 5. Urea: Amendments

The papers ranged from experiences with urea based NPK compounds to laboratory studies of the use of Ca/Mg salts, PPD (phenylphospho diamidate) and hydroquinone inhibitors. The relatively limited use of urea in granular compound fertilisers is attributed to difficulties in plant operation and product quality. With respect to urease inhibitors, the industry has yet to come out with more practical and cost-effective inhibitors than boric acid or high grade fertiliser borate.

Session 6. Urea: Isotopic technique in research

The papers described the isotopic technique using labelled ^{15}N to study N uptake in various crops such as tobacco, cocoa, maize and rubber.

Session 7 and 8. Urea: Usage in plantation crops

The Malaysian experience of urea usage in plantation crops is discussed in Keynote Paper 5, the abstract of which is available as an AAR Technical paper. PORIM presented the preliminary results of a network of trials to compare the efficiency of urea and ammonium sulphate which showed urea to be less effective than ammonium sulphate in increasing yields in oil palm. Controversial results were obtained by Sime Darby in cocoa where urea was found to be as good as ammonium sulphate. The wet weather during the period of urea application in this trial probably reduced volatilisation loss and led to favourable response to urea.

CONCLUSIONS

Short of burying urea in the ground, volatilisation loss is inevitable where application of urea is by surface broadcasting. The objective of research and management is to minimise volatilisation losses and variability. Thus the checklist of soil, environmental and management factors for optimising urea application contained in the paper by Chew and Pushparajah should act as a useful guide to the large scale usage of urea in plantations.

Very few papers touched on the improvement of urea *per se* and from data presented, none has come out with a more practical and co-effective inhibitor than boric acid and fertiliser borate recommended by AAR.

There appears to be a need to investigate novel techniques incorporating deep placement of urea or high concentrations to inhibit hydrolysis and these will be carried out at AAR soon.

Chan, K.S.

AAR Technical Papers (to September 1987)

13/87
Further exploitation of puncture tapping in Hevea.

CWH, Ho, J.P. Choo I.F., Owen, D., Lim J.K. & Laili Darus

ABSTRACT

Puncture tapping at ethephon concentrations ranging from 1.6% to 13.3% was evaluated on normal size and very young trees at opening in four trials.

In the oldest trial on moderately high yielding RRIM600 of normal girth, puncture tapping at the highest concentration of 13.3% over two panels and its subsequent conversion to conventional tapping covering a total period of 99 months, gave cumulative 15% higher yield and 6% higher net revenue than conventional control. Net revenues of treatments of other treatments with lower ethephon concentrations were lower than the control.

On trees of smaller girth of about 36.0 cm of the more precocious yielding PB260, puncture tapping at 6.7% ET and 13.3% ET gave positive net revenues over 22 months. On the less precocious yielding RRIM600, 623 and GTI of similarly small girth size as the PB 260, net revenue was negative at 5.0% ET but was positive at 10.0% ET. In another trial on PB 260 opened at a larger girth of about 48.0 cm, yield over the first 14 months was higher than the PB260 opened at the smaller girth of 36.0 cm.

Incidence of dryness was negligible with puncture tapping systems in all the trials although some trees suffered bark damage. However bark damage incidence was reduced by shortening length of puncture tapping needle.

Girthing was marginally better in puncture tapping systems stimulated at 3.3% and lower ethephon concentrations but was marginally depressed at higher ethephon concentrations compared with conventional control on trees of normal girth. With smaller trees, all puncture systems depressed girthing rate, some by as much as 30% when compared with untapped trees.

17/87
Implications of low branching height to further tapping

CWH & OTS

18/87
Refinement on young budding technique in rubber presented at 1987 TPSB Managers' Seminar)

OTS

15/87
Use of rachis analysis as an indicator of K nutrient status in oil palm (presented at 1987 International Oil Palm Conference)

TKC & CPS

ABSTRACT

Initial studies showed that rachis K% was highly related to the palm K% while pinnae K% showed poor relationship.

Sampling of various fronds showed that the region of least variation in rachis K% was between fronds 12 to 28, indicating that frond 17 was acceptable for rachis sampling. The middle section of the frond was more suitable for sampling as there was higher variation at the extremities.

Regression analysis of four selected trials gave better relationship between rachis K% and fertilizer K applied than between pinnae K% and fertiliser K applied. Regression of FFB yield on rachis K% was significant for the Rengam and Sogomana soil series. There was no significant regression of yield on rachis K% on the coastal clay soil as they was no yield response to K. This was confirmed by the high rachis K%. Regression of FFB yield on pinnae K% was not significant for all soil series. The critical rachis K% for the Rengam and Sogomana soil series was about 1.3%K. Yields started to decline markedly below 1.0% K but remained fairly steady between 1.3 to 1.6% K.

Rachis K% was more sensitive to fertiliser inputs than pinnae K%. The range of rachis K% was between 0.22% K for unmanured palms to 2.0% K for manured palms. In comparison, pinnae K% ranged from 0.6% to 1.2% K. The coefficient of variation of rachis K% for individual palms within the same K treatment plots was about 20% and was acceptable, when compared to 15% reported for commercial leaf K analysis.

As rachis K is part of a larger pool of reserve K in the palm, it is expected to fluctuate relatively less than pinnae K.

16/87
Potassium in the oil palm eco-system and some implications to manuring practice (presented at 1987 International Oil Palm Conference)

TKC & CPS

19/87
Prospects of *Oleifera* x *Guineensis* hybird for commercial plantations

SAC

12/87
Second report on the outbreak of *Setora nitens* in KDC estates, Sabah

MMM

14/87
Soil and crop suitability assessment report (Blk. III and IV) of the mid-Samarahan oil palm project area

KKK

22/87
Soil Survey and crop suitability report on Hung Yik II Estate (1415.57 ac.)

GK

23/87
Soil Survey and crop suitability report on Blk. 53

PK

24/87
Podzolic soils of KDC

KKK

25/87
Soil survey of Sakilan Desa (unplanted and abandoned areas only) for crop suitability

KKK & OLH

AAR Advisory Circulars

1/87
Glyphosate for general weed control in plantations

MMM

2/87
Poisoning of Gliricidia

OLH

3/87
Herbicide-induced parthenocarpy in oil palm

MMM

4/87
Leaf/soil sampling notes for oil palm

CSP

5/87
Leaf/soil sampling notes for cocoa

OLH

6/87
Cocoa plant hopper outbreak

OLH

7/87
*Rubber and soil sampling and analysis

OTS

SPECIFIC RECOMMENDATIONS CONTAINED HEREIN SHOULD ONLY BE IMPLEMENTED WITH PROPER AUTHORISATION.