PORIM – Then and Now

When the Palm Oil Research Institute of Malaysia (PORIM) was officially established in 1979, it had no place of its own. It also had only a few staff well-versed in palm oil.

Nevertheless, work went on with administrative staff located in a rented lot in Wisma Angkasaraya, Jalan Ampang, Kuala Lumpur, while research and development (R&D) work was divided between two laboratories – one based in a shophouse in Ampang Jaya and the other, in a factory in Datuk Keramat.

Today, PORIM's headquarters and laboratories in Bandar Baru Bangi, 30 km south of Kuala Lumpur, is a testimony to Malaysia's commitment towards palm oil research and development. PORIM has also set up offices and regional stations in Kluang, Ulu Paka, Teluk Intan, and regional offices in England, Pakistan and the USA. It also provides employment for more than 500 personnel, of whom 25 per cent are well-trained.

As a research centre, it is one of the foremost institutes in the edible oil industry and is internationally recognized as the world's biggest reference centre for oil palm genetic materials.

PORIM's rapid development has, in turn, contributed to an increase in the marketability of palm oil throughout the world. Palm oil now ranks No. 1 in terms of trade in oils and fats in the world. In terms of percentage share of total world production, it ranks second, after soya bean oil. Over 60 countries, including the United States, import palm oil – mainly for use in foods.

Commemorating its 10th anniversary this year, there is no denying that PORIM has stayed on track in achieving its objectives, to wit:

* Expanding and improving the current uses of palm oil;
* Finding new uses;
* Improving production efficiency and quality of products so as to strengthen or maintain its ability to compete with other oils and fats;
* Promoting the use, consumption and marketability of palm oil products.

To date, the institute has seen three Director-Generals – Dr C.C. Webster (1979 to May 1980), Tan Sri Datuk Dr Anuwar bin Mahmud (June 1980 to January 1987) and Datuk Prof. Augustine S.H. Ong (Feb 1987 – present).

Tan Sri B.C. Sekhar was appointed as the first Chairman of the Palm Oil Research And Development Board (PORDB). In an interview in England last April, Tan Sri Sekhar said the decision to set up a separate body to look into the various aspects of palm oil and its production was made in 1978.

Initially, as the Government embarked on a massive oil palm planting programme in the 1950s, its agricultural research needs were met by the industry itself with support from the Ministry of Agriculture. Then, when the Malaysian Agricultural Research and Development Institute (MARDI) was formed in 1969, it took over the research work.

With the approach of the 1980s, oil palm cultivation and the development of the industry were undergoing such rapid expansion as to make both the Government and the industry realize the need for a national specialized institute for palm oil.

"There was a general feeling that palm oil was not getting the priority it deserved." Tan Sri Sekhar recalled.

His main task then was to set up an institute which was cost and quality efficient. "It was to be an institute that would meet the industry requirements in both the short and long term. This was our mandate," he said.

In staff recruitment, Tan Sri Sekhar

ensured that proper screening was carried out so that only the right people were employed. In his efforts, he was much heartened by the acceptance of all parties involved about the need to act even before the PORIM building was established. Thanks to that PORIM became an entity much sooner than expected. .

That essentially explains PORIM's success. "The industry and the Government both understood the need for a first-class research establishment," he added.

The post of Director-General was offered to Dr C C Webster. Dr Webster came out of retirement and agreed to help establish PORIM. It was made clear then that it would only be a two-year stint.

"One of the first things I did was to draft the Act to create PORIM. As a non-legal man, I did what I could based on the RRI Act," he recalled in an interview in his home in Sevenoaks, England. This Act was finally passed in April 1979.

Dr Webster also located the site for PORIM's current building in Bangi. In the meantime, a small space in Wisma Angkasaraya was rented for office use. But finding lab spaces was difficult and Dr Webster went in search of them to universities, the RRI and SIRIM. "Nobody had any space to let," he recalled. Finally, premises in Ampang Jaya and Datuk Keramat were located for the set-up of temporary labs.

With the passing of the Act of Parliament, the Government provided a launching grant of $19 million for the PORIM building while the funds for the land purchase and equipment came from the MOPGC.

A research cess was imposed from January 1980, enabling the PORDB to receive regular funding from the industry. This cess – initially based at $4 per tonne of palm oil ex-mill and later raised to $5 per tonne in 1986 – would take care of PORIM's research and development.

From the very beginning PORIM's intention was not to duplicate the roles of other R&D institutes. It was to be an improvement over them and had functions under the broad categories of Administration; Techno-Economic and Technical Advisory Service (TAS); Chemistry and Technology; and Biology.

Around this time too, recruitment of staff began in earnest. Many of these were drawn from people in MARDI who opted to join PORIM.

In research programmes, PORIM's main thrust was the project on Vegetative Propagation. Dr Webster also initiated studies on Growth Regulators, experimenting with plant hormones and studying its effects on the oil palm. Research was carried out to find ways to get a better 'fruit set' that would yield a higher oil content.

Meanwhile, existing data from research work already done by MARDI, particularly on fertilizer and oil palm germplasm, was collected and analyzed by PORIM.

Parallel to this was the effort to expand the existing end-uses and find new uses for palm oil. Mostly, PORIM concentrated on food products like vanaspati, margarine and shortening. A number of countries including S Korea, Taiwan, Japan, Middle East, India and Pakistan were visited by PORIM officers to evaluate the market and determine what new steps to take in making palm oil more attractive to them.

Elsewhere, grants were given out to institutions for relevant research projects. No research was done on the nutritional aspects of palm oil, however. "In those days, we left that to the medical institutions," Dr Webster said.

With the end of Dr Webster's contract, Tan Sri Datuk Dr Anuwar bin Mahmud, then Vice Chancellor of Universiti Kebangsaan Malaysia, was approached and subsequently appointed as PORIM's second Director General.

With the preliminary groundwork already laid, Tan Sri Anuwar quickly set about expanding its infrastructure and establishing a partnership with the industry through closer collaboration.

"Among my first concerns was to build

up both the technical and supporting staff. We desperately needed lab facilities as well as more land and research station facilities," he said. As a result, PORIM now has five regional stations, with two more (one in Sabah and one in Sarawak) in the pipeline.

Tan Sri Anuwar also saw the groundbreaking of the PORIM headquarters and the setting up of the office in the new building in early 1984. "Training of staff was a priority as not everybody knew much about palm oil then. I had to get them involved and interested, not only on oil palm research but also on palm oil research," he said. "Our research needs grew in proportion to the tremendous increase in the production of palm oil. Then again, oil palm mills were being established and we had to look into that area as well."

Aside from MARDI, other big agencies in the industry such as Guthrie, Sime Darby, Harrisons and Crossfield, had already started their own research in the early 60s. However, as Tan Sri Anuwar pointed out, their research was for their own needs whereas PORIM was concerned with national needs. "But, we sought co-operation from them and they kept us informed so that we didn't duplicate what they have done. At all times, our research was tuned to the requirements of the country and the industry. There was no such thing as research for research's sake," he stressed.

PORIM's research results were disseminated through the Technical Advisory Service, which was first started in 1979 but given greater impetus in 1980. Its aim was to assist the industry in technical matters and look into the promotion of palm oil overseas. With this, teams of representatives were regularly sent out to the various countries of the world to promote palm oil.

The other was through the Extension Service, which provides the necessary information to relevant bodies like RISDA, FELCRA and officers of the Department of Agriculture who then disseminate it to the people who need to know, like the palm oil smallholders.

"Because palm oil was a relatively new product then, much transfer of technology was needed," Tan Sri Anuwar said. "We felt like pioneers, always exploring and seeking new findings."

"Because PORIM was set up to service a very big industry, we had to keep up with its very rapid development. In fact, we had to keep one step ahead," he said. Underlying this work ethic was his determination to develop PORIM into a leading vegetable oil research institute in the world.

In research, certain thrust areas were identified:

* *To develop new varieties of oil palm.* "The palm," said Tan Sri Anuwar, "must be improved from time to time. For this, our pool of genetic material had to be broadened. This was done by prospecting for and collecting materials from Africa, Central and South America." As a result, PORIM now has the biggest collection of genetic materials in the world.

* *Oil Palm Management.* In this area, the estates had already done well. But PORIM had also to look into the interests of the smallholders and the methods of planting, harvesting, etc.

* *Research on milling.* This was started to find ways to increase efficiency. To encourage and motivate the millers, PORIM began to award certificates for milling efficiency after the successful implementation of the certificate of competency for refineries.

* *Manufacturing of products.* Since palm oil is imported by 64 countries, it was necessary for PORIM to look into their individual requirements.

* *Quality improvement, assurance and control.* Since palm oil is one of the 17 oils and fats in the world, there was a need to promote its use, to put the fact across that it has no deleterious effect and is, in fact, a health food.

To facilitate the smooth running of these multifarious projects, a structure was set up in which the divisions of Biology, Chemistry and Technology, and Techno-Economic and Information would each have a sub-committee to look into their research needs.

This is then submitted to the Technical Advisory Committee, comprising members from the industry and those involved in palm oil, who will then prepare a programme covering the areas of research. On a higher level is the Programme Advisory Committee (PAC), made up of representatives from all over the world who are specialists in their particular areas of study. "The TAC tells PORIM what should be done and the PAC will then look at the programme, and offer its suggestions and amendments. So the PAC might say this project should be done this way and not that way or even say that some projects should not be done because they have already been done in other parts of the world. Through the PAC, therefore, PORIM not only avoids duplicating studies and wasting time and money but also maintains its image internationally," Tan Sri Anuwar explained.

Having ensured that PORIM was well on-track in its objectives and lucid about the importance of its role to the industry, Tan Sri Anuwar retired in early 1987. Datuk Professor Augustine Ong Soon Hock, who had first joined PORIM in 1981 as the Director of its Chemistry and Technology Division, was appointed the new D-G.

His foremost objective as D-G is to further consolidate PORIM's position as a research institute of international repute. Into its 10th anniversary, he is pushing the institute to pursue its mission with even greater vigour as embodied by the motto, "Towards Excellence." "Research," said Datuk Ong, "is the basis of PORIM. How we approach research might vary from D-G to D-G but basically, what we do is to identify our objective. And in the final analysis, it is the market." We want to get our palm oil into the various markets. By knowing the market needs, we can then work backwards to development work and even more basic work. "For example, we want to incorporate more palm oil into our products... let's say margarine in the developed market. But there is a constraint because palm oil has a limitation in its behavior in that its rate of crystallization is very slow. This, in turn, affects the cost of production. So, we have to find out what makes it crystallize so slowly to overcome this bottleneck."

As D-G, he sees his main role as being able to create the right environment in which research can flourish.

"The role of the D-G. is not a mere administrator; he should also be a leader in research activities. You can't just send out directives and expect work to be done. There must be stimulation, persuasion, inspiration and encouragement as well." He explained.

On PORIM's objectives, he said, "The objectives now and before have not changed greatly. Although we have made some progress, there is still a lot to be done.

"For example, we still cannot tell the industry how to reduce cost of fertilizer, which constitutes 30 per cent of production cost; tissue culture – to produce high yielding palm with high quality oil – is still not finished; and genetic engineering is just beginning.

"In areas where cost is high, we are also looking at whether we can be self-financing. Research stations, for instance, can be large and expensive. And when we plant research materials, they are not high yielding because the intention here is not so much to make money but to get the various genes and germplasm material."

"To reconcile this, we are combining the planting of research materials with commercial materials in such a way as to balance its low yield. That way, we can self-finance part, if not all, of the project."

In his overall endeavor to cut costs, Datuk Ong has many approaches. "But first, we have to determine the parameters that contribute to the costs. Having done that, we can address the problem."

At the moment, among the many research areas being looked into are:

* *Tissue culture.* To produce high yielding elite palms that are slow in growing tall, thereby further reducing the cost of harvesting;

* *To produce better quality oil.* "We want to get oil which is more liquid. In more technical terms we want oil with a better

IV value." (IV value measures the degree of liquidity and unsaturation of a oil).

* *Improve agronomic practices* and to find out the optimum use of fertilizer, which now constitutes 30 percent of production cost.

* *Pest control.* Although under control, this is an area of growing concern. Work on how best to control the rat population is underway. It is now found that a combination of chemical baits and the use of barn owls is a more economic way to deal with the problem compared to the previous method of using only chemical baits.

* *By-Product Utilization,* with the aim to attain zero waste. The oil palm produces a lot of biomass. At present, only a small percentage – the oil – is being used. Studies are being made to find uses for the fronds, the empty bunch, fibre, shells and even the trunks.

Already, some progress have been made, like in the production of kraft paper from the empty fruit bunch; the making of blockboard for building purposes from strips of the trunk; and the making of what is known as tiger furniture.

PORIM is also trying to isolate Vitamin E from the leaves, a process which has already succeeded on a lab scale.

Finally, the effluent. In this area, Datuk Ong indicated that measures are being taken to process the solids as a composite for animal feed and fertilizer. It is also possible to derive from it biogas to generate energy which can help power ancillary factories associated with the mills.

In a parallel development, the intensification of the anti-palm oil campaign by the American Soybean Association in the United States means that the Director-General, PORIM also has to divert some of his time and attention responding to the crisis and correcting the distorted information about palm oil.

It also means that urgent and greater emphasis needs to be placed on nutritional research. To date more than 40 nutritional research projects are being carried out world-wide to confirm and to extend our knowledge on the nutritional benefits of palm oil.

The forecast is bright as PORIM heads for the year 2000. "Palm oil has so many advantages vis a vis other oils. It is the most economic in terms of production cost; it is versatile in that it supplies both the liquid oil and the solid fats market; and it is stable," stressed Datuk Prof. Ong.

"Of the four important oils – soybean oil, palm oil, sunflower oil and rape seed oil – except for palm oil, the rest are liquid. So those who want oil in solid form will have to process it. That means extra cost plus having to content with the presence of unnatural trans-fatty acids.

"Meanwhile, the stability of palm oil allows the product to be used at high temperature without it deteriorating as fast as a liquid oil would. Consequently, food fried in it has a longer shelf life. Liquid oil would require processing (hydrogenation) to achieve this rare stability."

In the area of nutrition, Datuk Ong could easily list 16 facts that put palm oil way ahead of the other oils. Among these are its rich source of Vitamin E; its anti-thrombotic properties; its ability to lower blood cholesterol level; and its anti-cancer potential.

"Whichever way I look at it, the future has to be bright," Datuk Ong said. "Everything points to conditions becoming even more favourable towards a greater need for palm oil.

"Look at the world population. It is 4 billion now and expanding rapidly. In the most populated nations – like China and India – they do not have sufficient calories. The same holds true for other developing countries.

"The forecast is that by the year 2000, there will be a need for another 30 million tonnes of oil. Even with our projected production which will double by the 21st Century, we can only contribute to a fraction of this requirement.

"With increased demand, palm oil will be much sought after. Because it is the more economic oil, both in terms of lower cost of production and lower processing cost, all countries including the developing and under -developed,will find palm oil most acceptable."

In the final analysis, if one were to weigh the economic and nutritional advantages of palm oil against the other oils and fats in the world there is no question about the choice edible oil of the future.