

Newsletter BERITA ISOPB

THE INTERNATIONAL SOCIETY FOR OIL PALM BREEDERS
PERSATUAN AHLI-AHLI PEMBIAK BAIK KELAPA SAWIT ANTARA BANGSA

P.O. Box:10620 G.P.O. Kuala Lumpur, Malaysia

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■ Presidential Address

■ INTERNATIONAL SOCIETY FOR OIL PALM BREEDERS

The International Society For Oil Palm Breeders is pleased to announce the establishment of the Society. The Society came into being in August 1983. The formation of the Society was first mooted years ago in one of the meetings at Rome. Later the need for the formation of the Society was discussed at the International Oil Palm Conference held in Kuala Lumpur in 1981 where 33 members comprising breeders from Malaysia, France, Indonesia, England, Ivory Coast, Nigeria, Ghana, Brazil and Papua New Guinea were in attendance.

Palm oil has become an important source of vegetable oils and fats contributing about 15% of world's supply, Malaysia being the biggest producer. It has been realised that the future development of the oil palm industry would depend largely on the availability and supply of improved planting materials.

The establishment of the Society would be of great benefit to the industry especially to the oil palm industry in Malaysia. In Malaysia where oil palm is not a native crop the development of future planting materials will require or depend on international cooperation among various countries and research institutions for the exchange and collection of oil palm germplasm. The main aim of the Society is to advance the knowledge of oil palm breeding through international cooperation.

The Society plans to achieve this aim by engaging itself in the following activities:-

- (a) Organising symposium/workshops or meetings both locally and internationally;
- (b) Establishing committees, working groups, to deal with specific aspects on problems of oil palm breeding;
- (c) Arranging scientific meetings for the purpose of exchange of views, international collaboration and dissemination of information;
- (d) Promoting and assisting in international exchange of genetic materials for breeding;

(e) Publishing a newsletter/journal reporting the research activities in the field of oil palm breeding.

The Society shall, when and where appropriate, carry out these main activities in consultation/or in collaboration with the Food and Agricultural Organisation (FAO) of the United Nations, and with other international organisations.

As a first step, the Society plans to organise a meeting on oil palm germplasm in 1985 with the cooperation of Palm Oil Research Institute of Malaysia (PORIM) and the International Board for Plant Genetics Resources.

The workshop would provide an opportunity for the oil palm breeders to get together and discuss various topics concerned with oil palm breeding such as methods of germplasm collection, evaluation, utilisation of germplasm for improving present breeding materials.

The launching of this inaugural issue of the ISOPB Newsletter heralds the start of an important function of the Society in providing a convenient means of communication of the latest developments and news in oil palm breeding among its members.

Hopefully the launching of this inaugural issue of ISOPB Newsletter also serves as a membership recruitment drive to encourage oil palm breeders and breeding stations to send in their membership applications if they still have yet to do so.

President ISOPB

EDITORIAL

When 33 breeders from 4 continents and 10 countries met to inaugurate the formation of ISOPB; during the 1981 International Oil Palm Conference at Kuala Lumpur, it was a consequence of a general feeling that the community of oil palm breeders had grown rather sizeable and that a society was needed to promote international cooperation in the exchange of ideas, information and germplasm. The publication of a newsletter or journal is one of the stated prime objectives of the society. While a journal may be considered rather ambitious or premature at this juncture, a periodic newsletter will be very useful in providing a vital link between members in the quick dissemination of technical ideas, information and news of common interest.

The editorial board intends to publish the ISOPB Newsletter quarterly with the following broad outline of contents in mind:

1. Editorial
2. Feature articles

Technical or semitechnical ideas and communications related to oil palm breeding

3. Abstracts of papers related to oil palm breeding published/presented or to be published/presented of interest to members

4. News

Short technical communications or news social news

5. Conferences/Events

Diary of meetings and events of interest to members.

The choice of contents for the Newsletter is by no means final, any other article of interest to members eg. letters to editor, technical comments, can be included. Similarly although the Newsletter is envisaged to be a 4-8 printed page effort, it can be expanded when necessary.

In this inaugural issue besides the presidential address, we have as feature articles write-ups on the breeding programmes of two Malaysian public research bodies, PORIM and Department of Agriculture, Sabah and an inventory of oil palm breeding stations and breeders in Malaysia. In the next issue we will feature some of the breeding programmes of private research companies in Malaysia. We will continue this approach for subsequent issues and appeal to members in other countries to write on their breeding programmes and supply an inventory of the oil palm breeding stations and breeders in their respective countries. We will have other feature articles lined up as well.

Undeniably, this inaugural issue tends to be biased towards the Malaysian scene. This was done out of necessity to launch the Newsletter, rather than to dominate the news. ISOPB is an International Society, hence we appeal to all oil palm breeders, particularly from other countries, to become members and contribute actively to the Newsletter. Any contribution no matter how small or trivial will contribute towards the success of the Newsletter and the Society.

Editorial Committee

Feature Articles

A. OIL PALM BREEDING AND GENETICS RESEARCH AT THE PALM OIL RESEARCH INST. OF MALAYSIA (PORIM)

1. ORGANISATION

As of June 1984 oil palm breeding and genetics research at PORIM was organised as follows:-

EXECUTIVE

1
Director General
(Tan Sri Dr. Anwar Mahood)

2
Director Biology Division
(Dr Haji Halim Haji Hassan)

SCIENTIFIC

Plant Breeder I
(Dr N. Rajanaidu)

Plant Breeder II
(Vengeta Rao)

3...

Germplasm pro-
spection & eva-
luation; general
oil palm
breeding

germplasm eva-
luation oil palm
breeding selec-
tion methodo-
logy

Central
Services
Unit
breeding
(Statistical
services)

Chemistry
Division
(Analytical
services)

TECHNICAL

2 Assistant
Research Officers
(ARO)

2 Assistant
Research Officers
(ARO)

Collabora-
tive
research
(Physiology)
unit, Tissue
Culture unit,
other oil
palm research
organisations

4 Research Assistants
(RA)

9 Research Assistants
(RA)

1. - The Director General - a geneticist himself, follows the research activity with keen interest.
2. - The Director - a plant breeder oversees the research programme
3. - Proposed intake of another breeder, a biometrician and a biochemist

2. THE RESEARCH PROGRAMME

Objectives :

- o to widen the range of genetic materials available to breeding programmes and to contribute to the conservation of genetic variation
- o to carry out studies that will contribute to more efficient selection procedures
- o to supplement existing breeding programmes with special attention to the needs of the smallholders and quasi-government plantations.

2.1 Main line research

2.1.1 Conservation and Utilisation of Oil Palm Genetic Resources -

a. Species : Guineensis

Early breeding materials inherited from the Dept. of Agriculture and MARDI are still maintained and used to supply recurring requests from other oil palm research organisations. Important materials in private research organisations earmarked for destruction are salvaged (seed/tissue) and conserved elsewhere.

Work on the Nigerian germplasm, obtained through the MARDI/NIFOR joint prospection is well advanced. Evaluation of the material grown in designed trials is nearing completion. This will be followed by a phase of utilization involving all interested breeders.

A prospection and collection expedition in Camerouns and Zaire has been made.

b. Species : Oleifera

A section of Martineau's collection (1967) and descendants of the first oleifera introduction are still maintained. They are used to create hybrid progenies and to fulfill recurring requests from other research centres.

An expedition was organised in 1981/82 to Colombia, Nicaragua, Honduras, Costa Rica, Panama and Surinam. The plants from this prospection will soon be field planted in a designed trial.

2.1.2 Breeding and selection methodology

The pattern of variation for oil content and other bunch components has been established for E. guineensis and E. oleifera bunches. Studies on the better estimation of the true oil content of oil palm bunches are in progress. Work on fruit development and ripening in E. guineensis, E. oleifera and their hybrids will be published soon.

The pattern of within bunch variation and repeatability values for palm oil fatty acid composition in the two species and their hybrids have been established. Currently germplasm collections, advanced breeding palms, and the interspecific hybrids are being screened for oils with superior unsaturation, cocoa butter replacer composition and other special properties.

- Populations of short palms are being assembled to study height and its manipulation for breeding palms with lower height increments.

The genetic architecture of Nigerian palm population has been established in respect of vegetative traits. Studies on the reproductive biology, yield, bunch components and fatty acid composition are in progress.

In 1982 a triple test cross programme using the 2 species as 2 parents was organised. The aim was to establish the genetic basis of the inheritance, especially of heterosis, in the hybrids. The controlled test crossings to have the necessary populations are nearing completion.

Inbred lines are extremely useful for both breeding and in genetic studies. In oil palms, a project to create a diverse range of inbred lines by the method of single seed descent has been initiated in PORIM. First selfings are being made this year.

2.2 Collaborative research

The breeding unit has worked in collaboration with the physiology unit of PORIM for a better understanding of the physiological basis of breeding improvement. New selection criteria have been defined.

Similarly the breeders work in close liaison with PORIM's tissue culture unit. Breeders select, both from PORIM's trials and elsewhere, superior ortet palms for vegetative multiplication. The resulting clones will be tested by the breeders before dissemination to the industry. Clones are also used in genetic experiments.

Research collaboration extends to the industry as well. Samples of germplasm and breeding materials are planted and evaluated in joint trials with private research stations. In the past year a joint collaborative study involving all breeders on the bunch analysis method was successfully conducted. Similar work on sampling and precision is currently

being planned. PORIM also provides data analysis and interpretation services to other agencies.

3. Ancillary facilities

The PORIM breeding research and development programme is supported by the following facilities.

In addition PORIM has planted trials with Guthrie's (Chemara), United Plantations, H&C, HRU, Sime Darby, Felda, Univ. Pertanian, Dept. of Agric. Sabah, Sabah Land Dev. Board and State Dev. Corp Trengganu.

Vengeta Rao
PORIM

■ B. OIL PALM BREEDING AT DEPARTMENT OF AGRICULTURE SABAH

Location area (ha)	Exper- mental staff	Scientific staff	Technical facilities	Physical
PORIM Station Kluang, Johore	50	Vengeta Rao	2 Assistant Officers 9 Research Assistants	-breeding laboratory - bunch analysis laboratory - seed production facility - powerful micro-computer - large nursery
PORIM Station Serdang Selangor	25	Dr. N. Rajanaidu	1 Assistant Officer 4 Research Assistants	- breeding laboratory - bunch analysis laboratory - pollen & seed handling facilities
PORIM - Bangi, Selangor	-	-	2 Research Assistants	- laboratory facilities - mainframe computing facilities - central statistical services
PORIM Station Paka, Trengganu	15	-	1 Research Assistant	- bunch analysis and seed production facilities planned
PORIM Station Jerangau, Trengganu	5	-	1 Assistant Research	- bunch and seed facilities

Oil palms have existed as ornamentals in Sabah as far back as in 1884 but commercial plantings only started around 1960. The State Government at the time realised the potential of the crop as Sabah has vast areas of suitable land. Forthwith, plans were made to pave the way for the oil palm industry in Sabah. A study, which included an advisory report by Mr. C.W.S Hartley, culminated in the establishment of an oil palm research station, whose priority was to initiate a breeding programme aimed at producing high yielding seeds for local environmental conditions.

Breeding Populations

Breeding materials were obtained through an exchange scheme organised between 4 Malaysian and 3 African participants. Thus, the Sabah Breeding Programme contained African tenera selections crossed on to the Malaysian Deli Dura selections as well as Deli dura selfs and crosses and African tenera selfs and crosses.

The Malaysian participants were Chemara, Harrisons & Crosfield, Socfin and the Federal Department of Agriculture. The origin of their Deli dura contributions could be traced back to four palms in the Bogor Botanical Gardens in Java. (Fig. 1).

The West African participants were the Nigerian Institute for Oil Palm Research, Unilevers Nigeria, and Unilevers Cameroun. Chemara also contributed teneras of mixed Deli and Congo origins. (Fig. 2).

Breeding Scheme

The breeding scheme intended for the programme at its inception was the Reciprocal Recurrent Selection (RRS) which originated from maize breeding research and is adapted in oil palm breeding. Basically, it involves the repeated selection of parents based on the performance of progeny test crosses. RRS in oil palm breeding is outlined in Fig. 3.

The system practised in IRHO and other West African organizations closely follow the RRS system and is referred to as RRS in this communication. As the choice of parental families,

are based on DxT progeny test crosses, only the latter are planted in replicated trials.

Another method practised in most oil palm organizations in Malaysia is shown in Fig. 4. This will be referred to as the 'modified recurrent selection'. Crosses within the respective populations are planted in replicated trials. Dura mother palms are selected on family and individual performance. Pisifera pollen parents are selected on their sib tenera performance, and on DxP progeny test results. This system avoids the effects of inbreeding depression by obviating the use of selfs.

The scheme now adopted by Ulu Dusun is a combination of both systems. As problems such as pollination and germination have sometimes prevented planting of crosses, the progeny testing is also backed up by comparison of the parental families through replicated trials. This has turned out to be a more flexible system. In many cases where we have DxT progeny test results, selection is practised as per RRS; where we do not, we can still do family and individual selection followed by DxP progeny testing as per the modified R.S.

Additional Characteristics of the Programme

The programme has other useful characteristics, namely one generation cycle is saved by planting both the parental crosses and the test crosses simultaneously. Moreover, some speculative recombination DxD and TxT crosses are planted and where selected, will save another generation time. Finally, as the same crosses are planted by other participants, some in widely different environments, additional information on the genetic value of these materials can be obtained from genetic x environmental studies.

Breeding objectives

The improvements of primary concern are oil yield and height reduction. Breeding for disease resistance is not warranted as at present because diseases are not serious and can be more easily controlled by good agricultural practices. Improvement in oil composition will be a subject for future studies.

Selection Criteria

Selection in RRS - Selected progeny tested families yield between 6.1 to 9.7 tonnes of oil/ha/yr. The FFB yield is the mean of 6 years' yields from the 5th to 10th year.

Selection in modified RS - Parental families are selected based on their superiority over the trial average. Individual dura mother palms have FFB yields ranging from 175-260 kg/palm/yr. As pisifera pollen parents are mainly female sterile, they are finally tested in DxP progeny trials.

Progress

The first generation of DxP seeds are being produced for estate planting.

In view of the introduction of weevils (*Elaeidobius kamerunicus*) all progenies are now being reassessed for possible changes in bunch characteristics.

A second cycle of breeding materials are being produced consisting of an improved series of DxT test crosses, and selfs and crosses of selected parents.

Under the 'Short Palm Programme', crosses have been produced from progenies selected for low height increment.

A joint PORIM/DQA Sabah project on the evaluation of inter-specific *Elaeis oleifera* x *Elaeis guineensis* hybrids for the improvement of oil composition, height reduction and disease resistance is in progress.

Outstanding palms are being selected for future clonal tissue culture propagation.

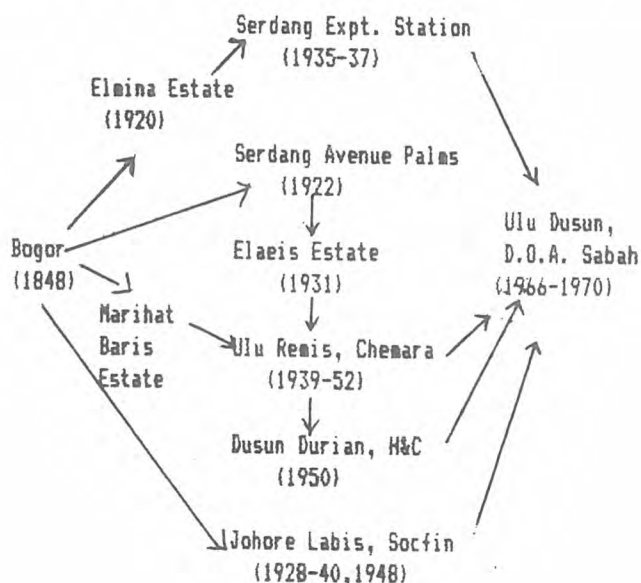


Fig. 1. ORIGIN OF DELI DURA FAMILIES IN THE SABAH BREEDING PROGRAMME

■ INVENTORY

Oil Palm Breeding Stations and Breeders in Malaysia

A. Public.

1. Palm Oil Research Institute of Malaysia (PORIM)

Director General : Anuar bin Mahmud
 Director of Biology : Abdul Halim Hassan
 Senior Breeder : Rajanaidu, M.
 Breeder : Rao, V.

2. Department of Agriculture, Sabah

Ulu Dusun Research Station,
 P.O. Box 1401, Sandakan,
 Sabah.

Asst. Director (Research) : Tay, Eong Beok
 Breeder : Ngui Liang, Mary

3. Felda Agricultural Services

Pusat Penyelidikan Pertanian Tun Razak,
 Sg. Tekam, Jerantut,
 Pahang.

General Manager : Chong, Gong Gong
 Senior Breeder : Chin, Cheuk Weng
 Selectionist : Abu Zarin Othman

B. Private

1. Ebor Research (Sime Darby)

P.O.Box 202,
 Batu Tiga,
 Selangor.

Director : Wood, B.J.
 Breeder : Tan, Swee Tian

2. Guthrie Research (Chemara)

Labu Road, Seremban
 Negeri Sembilan

Controller : Mohd. Aminuddin Rouse

Head of Oil Palm Section : Chan, Kook Weng
 Breeder : Ong, Eng Chuan

3. HMPB Oil Palm Research Station,

P.O.Box 207

Banting, Selangor.

Director : Sheppard, R.
 Asst. Director : Yeow, Kheng Hoe
 Breeder : Lee, Chong Hee

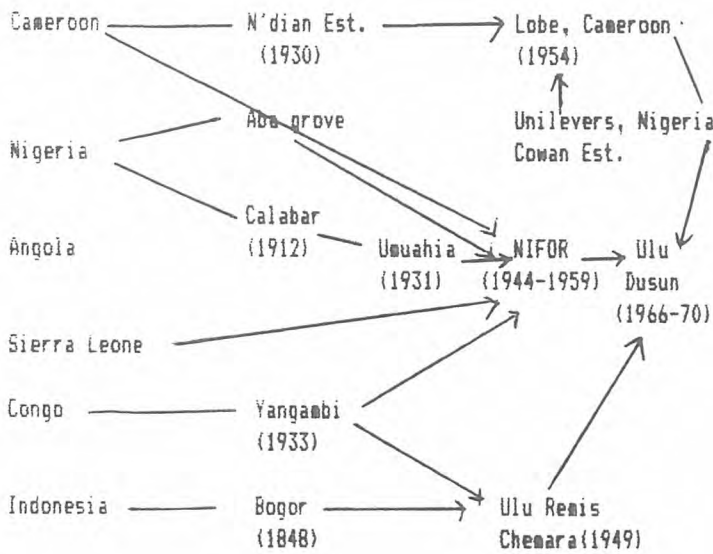


Fig. 2. ORIGINS OF TENERA FAMILIES IN THE SABAH BREEDING PROGRAMME

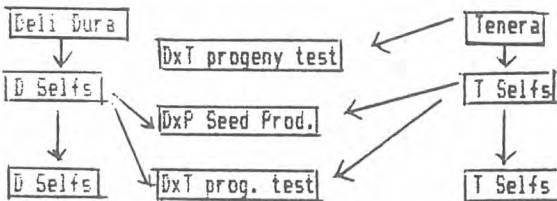


Fig. 3. RECIPROCAL RECURRENT SELECTION IN OIL PALM BREEDING

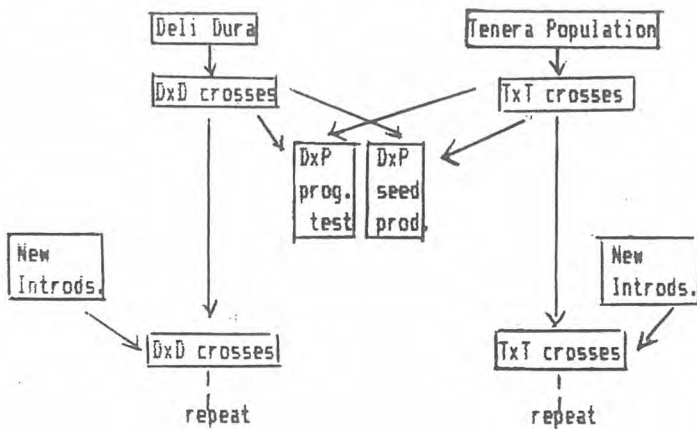


Fig. 4 MODIFIED RS AS PRACTISED IN PENINSULAR MALAYSIA

Mary Ngui Liang
 D.O.A. Sabah

4. HRU Sdn. Bhd.,
Langat Road,
P.O.Box 2009,
Klang, Selangor

Head : Chew, Poh Soon
Breeder : Soh, Aik Chin

5. Pamol Plantations Sdn. Bhd.,
Research Department,
Pamol Estate,
P.O. Box 101,
Kluang, Johore.

Senior Agronomist : Law, Ing Hock
Breeder : Donough, Christopher R.

6. United Plantations,
Research Department,
Jenderata Estate,
Teluk Intan, Perak

Controller : Tan, Yap Pau
& Breeder

■ News

Closure of Socfin Breeding Station

Socfin decided to close down their experimental station and thus their oil palm breeding programmes in 1983. Socfin has been one of the earliest pioneers in oil palm breeding and seed production, and during this span of 40 odd years have accumulated a range of genetic materials. As a magnanimous gesture, Socfin has made available their genetic collections to other breeding stations.

Review of PORIM's Breeding and Genetics Research Programmes

Reflecting the Malaysian oil palm industry's concern with the possibility of further yield improvement in the oil palm to make palm oil more competitive in the world despite the generally high yields obtained, three well known consultants were invited in 1983 to review PORIM's breeding and genetics research programme with the view to draw up a comprehensive long term strategy and programme for PORIM and the industry.

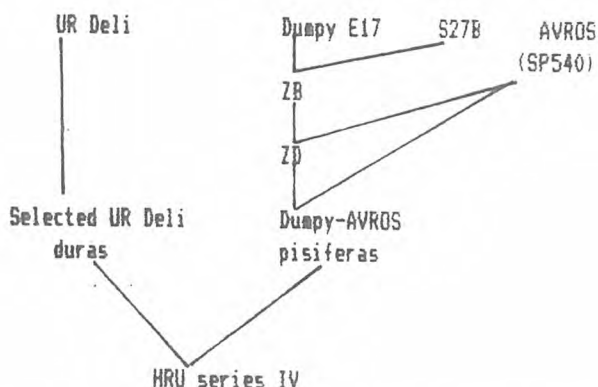
The consultants were : J.J.Hardon, a former Malaysian oil palm breeder presently with the Dutch Agricultural Directorate, J.Meunier, breeder and geneticist with IRMO and M. Lawrence a biometrical geneticist with University of Birmingham, U.K.

Establishment of New Oil Palm Tissue Culture Laboratories

Guthrie Research (Chemara) and Dunlop Research recently advertised for plant tissue culturist appointments. These brings to date a total of 7 organisations in Malaysia which are getting into the oil palm clonal propagation business, the others being Bakasawit, PORIM, Felda, HRU, Sime Darby and Department of Agriculture, Sabah. The first four have succeeded in obtaining plantlets. There is a strong possibility of a further one or two groups entering the field.

HRU Series IV DXP Commercial Seeds

HRU recently promoted their latest series of commercial DXP material which was claimed to be distinctly shorter and smaller than current DXP materials available in Malaysia and are capable of high early yields. The lineage of these materials is



The original Dumpy palm E206 was found in an estate (Elmina) associated with HRU. It is thus not surprising that the Dumpy lineage has featured prominently in HRU's breeding programmes.

PEOPLE

M.T. Arasu, editor of ISOPB Newsletter, and formerly Head, Oil Palm Branch, Malaysian Agricultural Research and Development Institute (MARDI) left for the University of Birmingham England to write up his PhD dissertation on the genetic variability of oil quality traits in the Nigerian prospected materials. This will be the second PhD and the third thesis derived from the Nigerian prospection. Rajanaidu obtained his M. Sc. and PhD from data collected from these prospected materials. By next year, presumably another PhD will be added to the list when Vengeta Rao writes up his thesis.

In Arasu's absence, Soh Aik Chin is serving as acting editor for the Newsletter.

Lee Chong Hee, in April this year spent 10 days in Sumatra examining the oil palm breeding programmes of Marihat, RISPA, Socfindo and Lonsun.

Ho, Chai Yee, ISOPB Treasurer and formerly Controller of Ebor Research, Sime Darby, has assumed his new assignment as Director of Development in Sime Darby. Ho was a rubber breeder in the Rubber Research Institute of Malaysia prior to joining Ebor Research.

Geoff Squire, crop physiologist and senior research fellow with PORIM, left PORIM in July at the end of his appointment. Squire has been working closely with PORIM breeders on defining the physiological parameters of crop yield and the oil palm ideotype. He delivered a talk on this topic to oil palm breeders and agronomist on July 10, and has promised to contribute an article on oil palm ideotype or related topic to ISOPB Newsletter. Prior to his engagement in Malaysia, Squire was with Monteiths' Crop Physiology Group in the University of Nottingham.

Rajanaidu just returned from a 4 month prospection trip to Cameroun and Zaire. Hear about his exploits in the next issue of the Newsletter. Talk about genetic stability, Rajanaidu must be one of the most genetically stable human beings for he seems to thrive in most environments. Perhaps we can include J. Meunier to this list too.

Chin, Cheuk Weng, oil palm breeder with Felda has at long last decided to tie the nuptial knot. Before long the country will be enriched with superior progenies from the Chin's. By and large oil palm breeders, at least in Malaysia, are poor breeders at home both in precocity and prolificacy, not that they mind having to do more progeny-testing to prove otherwise.

■ MEETINGS/EVENTS

- 1984
- Oct. 15-17. 1984 International Conference on Cocoa and Coconuts, Progress and Outlook. Kuala Lumpur, Malaysia
- Nov. 11-16 ADCS-PORIM World Conference on Processing of Palm, Palm Kernel and Coconut Oils, Kuala Lumpur, Malaysia
- 1985
- Mar. 25 ISOPB-PORIM. Workshop on Oil Palm Germplasm and Utilization, Bangi, Malaysia.
- Nov. 25-29 Society for the Advancement of Breeding Researches in Asia and Oceania (SABRAO) Fifth International Congress New Frontiers in Breeding Researches. Bangkok, Thailand



■ ISOPB Committee Members

- President : Tan Sri Datuk Anuwar bin Mahmud (PORIM)
- Vice President : Haji Abdul Halim Hassan (PORIM)
- Secretary : Rajanaidu, N (PORIM)
- Treasurer : Ho, Chai Yee (SIME DARBY) (till 14/8/84)
- Editor : Arasu, N.T. (MARDI)
- Committee : Tan, Swee Tian (SIME DARBY) (Acting Treasurer)
- Member Chin, Cheuk Weng (FELDA)
- Regional : Europe - Noret, J.M. (IRHO)
- Committee : Africa - Akpan, E.E.J. (NIFOR)
- Members : Jacquemard, J.C. (IRHO)
- South America - Nascimento, J.C. (EMBRAPA)
- Asean/Pacific - Lubis, A. (MARIHAT)

■ Editorial Committee

- Editor : Arasu, N.T. (MARDI) (on study leave)
- Members: Rao, V. (PORIM)
- Soh, Aik Chin (HRU) (Acting Editor)

