



Newsletter BERITA ISOPB

THE INTERNATIONAL SOCIETY FOR OIL PALM BREEDERS
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EDITORIAL

It has been awhile since this newsletter was put out and I would like to invite members to write in any suggestions or contribute articles of interest for the newsletter. Since this is my first attempt as editor, I welcome any suggestions or criticism from members during this learning curve.

For this issue, I have tried to provide some information on the XIII International Oil Palm Congress at Hilton Hotel, Cartagena, Colombia which was held on the 6th till 8th September 2000, since very few breeders from South East Asia participated in this congress.

The conference was jointly organized by CENIPALMA and FEDEPALMA. Only abstracts were given for all the papers and I have tried to provide some more information based on what I could gather from some of the sessions I attended. Some of the information on the presentations covering Physiology, IPM, Plant Protection and Agronomy have been included since I felt that some members may find these useful.

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Society News.....

REVIEW OF SOME OF THE PAPERS PRESENTED DURING THE XIII INTERNATIONAL OIL PALM CONGRESS AT CARTAGENA, COLOMBIA ON 6 - 8TH SEPT 2000

By Mukesh Sharma

1) Identification of Physiological Variables Associated with production in oil palm materials.

This study done was carried out at Cuernavaca Plantation in East Colombia, which is close to 1000m above mean sea level and has an annual rainfall of 3000mm per year. Six progenies were evaluated from planting materials derived from Unilever, which have been selected for resistance to Bud Rot of the shoot.

The objective was to identify physiological variables associated with yield. Significant differences were noted between the progenies for photosynthetic and transpiration rates, in response to changing levels of humidity with time and season. The light saturation point was $1000\mu\text{mol}/\text{m}^2/\text{s}$. Some progenies were less sensitive to these environmental changes (gas exchange rates remain constant even in low humidity) reflecting more efficient use of water resources. However, the high yielding progenies showed a greater response and sensitivity to water vapour pressure deficit. Stomata density was related to higher photosynthetic rates but this density declined during the dry season. The correlation for differences in leaf area or total leaf dry weight and ffb yield was low.

2) Fluctuations of the Pollinator Population and Relationship to the formation of the bunch for the Northern & Eastern Zones of Colombia.

Studies were carried out to seek an explanation for the Seasonal drop in % Oer. 100 recording palms were studied 16 months for the sex ratio and the population density of the introduced *E. kamerunicus* and the indigenous *Mystrops* sp.

Bunch analysis was then carried out to study the role of Sex Ratio, Weevil population, pollen viability, rainfall and temperature on fruit-set. In Northern Colombia, there was a clear correlation between the *E. k* population and fruit-set. Weevil population varied between 13,000 to 110,000 per male inflorescence at anthesis. They found no correlation between rainfall and weevil population. The authors claimed that high weevil populations may affect the availability of pollen because the weevil feeds on pollen.

Recalling the meticulous work of Dr. R. A. Syed where he found that all the curculionids from the sub-family Derelominae which includes *E. kamerunicus*, *E. plagiatus*, *E. bilineatus*, *E. singularis* and *E. subvittatus* feed on the soft tissues of the male flower at anthesis i.e. the filaments and anther tubes....there was no mention or indication that they feed on the pollen itself (basis for classifying the relationship between the oil palm & *E. k* as symbiotic). When enquired if any dissection work was carried out to confirm that there was significant amount of pollen in the weevils' mid-gut, they replied no. It is opined that in the Eastern zone, the high rainfall and high sex ratio resulted in poorer pollination partly due to the insufficient male flower production and high humidity resulting in poorer pollen dispersal and rapid deterioration of pollen viability during the very wet season.

3) Behavior of the viability of oil palm pollen in the Northern Colombian Zone.

The annual rainfall in Northern Colombia is 1200mm per year with a mean relative humidity of 81%. Under these conditions, 11 male inflorescences were protected from the rain whilst another 10 were exposed to rainfall. Pollen viability was determined daily from each flower. Results obtained showed that pollen viability declined from 76.3% (Day 1) → 76.0% (Day 2) → 68.0% (Day 3) → 42.0% (Day 4), from anthesis (fully bloomed). Low rainfall did not adversely affect the pollen but rainfall exceeding 12mm per day significantly reduced the viability of pollen. The timing of rainfall also had an impact on subsequent fruit set:

Anthesis of Female Flower	% Fruit Set in Bunches
1 - 4 days after rain	38.4
9 - 14 days after rain	53.8
More than 15 days	56.0

4) Selection of Dura Progenitors Adapted to the Conditions of Magdalena Medio.

The dura palms produced by the Institute de Fomento Algodonero (or known as IFA Duras) was the earliest source of planting materials in Colombia. From these 1960s plantings, CENIPALMA short-listed 130 palms for evaluation and possible introduction into their breeding programme. The objective is to select for ffb, oil and adaptive tolerance to local pest and diseases. Since starting the project in 1997, elite palms have been identified and screened for resistance to bud rot by inoculating their progeny with the fungus *Thielaviopsis paradoxa*. They also looked for yield stability i.e. palms with low year to year variability for ffb production in the selection protocols. Interestingly, some of the dura palms from this old generation had outstanding mesocarp to fruit (55%) and oil to bunch (26%).

5) Molecular Characterization of Dura Materials in the Promociones Agropecuarias Monterrey Plantation.

Preliminary results were presented for the IFA Duras described in Paper No. 3) above, using RFLP and AFLP molecular techniques. They are trying to categorize the palms into genetical groups and look for markers for tolerance / resistance to bud rot.

6) Influence of Pruning over the Physiological & Productive Performance of the Oil Palm in the Colombian Northern Zone.

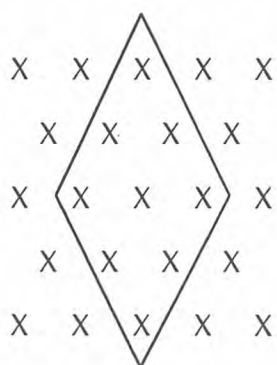
The objective is to re-examine the critical leaf area required for optimal yields under Colombian climatic conditions. The ffb yields for 2 frequencies x 3 levels of pruning were evaluated over 3.5 years.

The optimum regime was to maintain 30 fronds/palm with pruning once every 6 months. FFB yield declined when the number of fronds was reduced to 24 fronds whilst the difference was not significant between 30 and 36 fronds/palm. This reaffirms that under pruning has a lower economic impact when compared to over pruning.

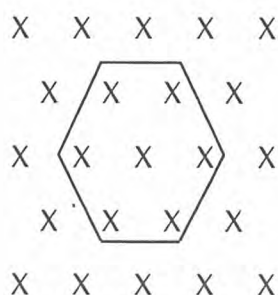
7) Thinning-related Vegetative and Productive Behavior of some materials planted in the Eastern Plains of Colombia.

Dami derived DxP materials (Deli x AVROS) were planted at 143 palms/hectare in 1986. Initial yields increased to 26.7 t ffb/ha in 1992 after which yields declined gradually with increasing competition to only 19.1 t ffb/ha in 1996. Bunches were wedge-shaped owing to the acute angle of insertion of fronds with marked elongation of fronds due to etiolation. The annual rate of stem increment was 1.2m/year against only 0.7m/year for Deli x La Me.

In 1996, hexagonal thinning was carried out i.e. 15% reduction of stand to 121 palms/ha. The result of this was improved bunches (rounder or better fruit set) and increase in Av. Bunch Wt (27.8 kg). In 1999, the ffb yield was higher in the thinned plots (165 ha) i.e. 25.5 t ffb/ha/year when compared to plots where no thinning was done (only 24.6 t ffb/ha). The lack of a more significant response was attributed to excessive reduction of stand. The authors suggest the adoption of the 'Diamond Model' instead of 'Hexagonal Model' for future thinning trials:



Diamond 1: 9



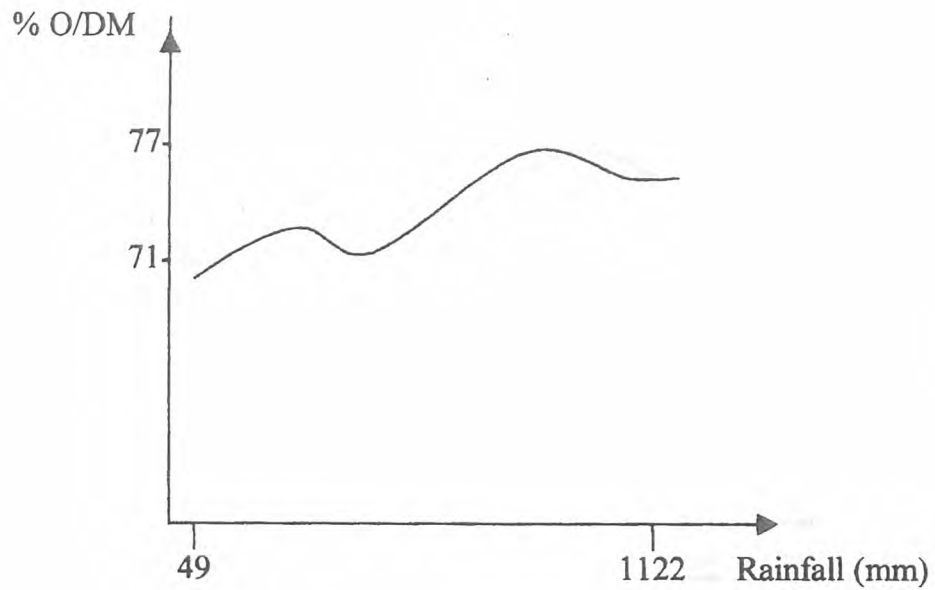
Hexagon 1: 7

8) Bunch Development and Oil Formation in different times of the year.

This trial was carried out in Northern Colombia where there is a seasonal decline of %Oer in mills from December to February. The trial is still on going and results were reported from ASD's Deli x AVROS DPs (Ex-Dami origin), which was planted in 1987. Starting in November 1998, female inflorescences were marked at anthesis and with 4 bunches taken at random starting at 12 weeks from till 23 weeks from anthesis. The bunches were grouped according to the following classes at the time of harvest: 1 loose fruit (LF), 2-5 LF, 6-10 LF and > 10 LF per bunch.

Results to date showed %Oil/Dry Mesocarp was insignificant at 12th week from anthesis but rose drastically after the 16th week before reaching maximum values at 21-22 weeks. There were no significant differences between the various loose fruit categories, which implied maximum oil synthesis on the onset of detachment of a single loose fruit, under normal circumstances but abscission rate showed seasonal fluctuations. Environment appeared to play a role whereby the June Period had highest % Oil/Dry Mesocarp i.e. 76.4% against the April Period, which had the lowest values i.e. 71.5%. I take it that the periods when abscission took place accompanied by low oil to dry mesocarp is similar to the phenomenon known to those in Malaysia as premature ripening.

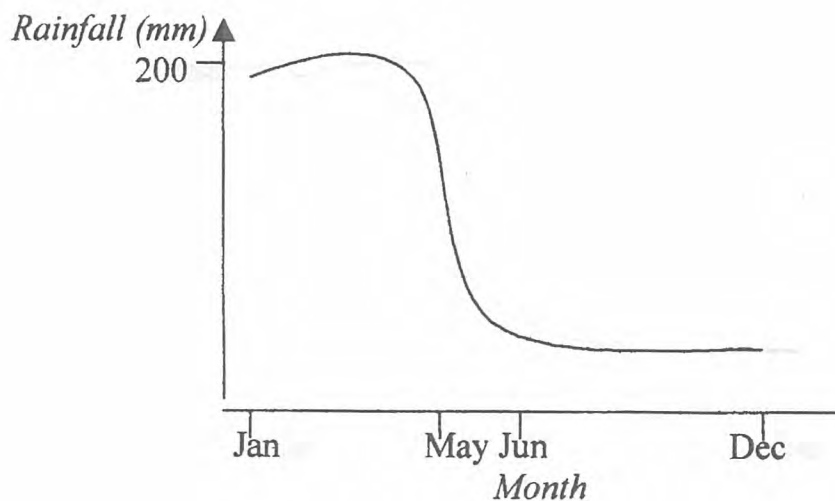
Periods of extremely low & excessive rainfall were opined to account for these differences :



9) Influence of Fertilization and Irrigation on the Development, Nutrition and Efficiency of the African Oil Palm on the Zone of Quevedo in Ecuador.

The authors estimated that there are 91,000 ha of oil palm in Latin America. In Quevedo, the cultivation of *E. guineensis* started in 1985 and covers 17,000 ha to date. The soils are strongly acidic in contrast with the soils with udic moisture regimes, which are more suitable for oil palm. However, they expect satisfactory yields owing to the good rainfall (2094 mm/year) and high relative humidity (84%).

They then stated in apparent contradiction that the 8 months of dry season poses limitations to the site yield potential:



The soil is derived from volcanic ash, has Ph = 6.3, high Mg and Ca content and palms growing on these soils frequently suffer from a nutritional disorder known as 'Yellowness' ('Amarillamiento' to the locals). This is thought to be caused by nutrient imbalance.

A Fertilizer x Irrigation Trial was carried out to overcome these limitations on mature palms planted at 143 points/hectare. Results obtained to date indicates that ffb yield was lowest in the Control (no fertilizer and) < N Application < NPK Application < NPKMgS Application < NPKMgS+ Ca(OH)₂. There was a significant interaction between the Irrigation and Fertilizer components. Nitrogen fertilizers reduced the Ph and the application of Lime (98% strength) countered this by raising the Ph from 5.5 to around 6.2. The authors were baffled on the response to liming in a soil, which has a high Ca content:

10) The Bud Rot Complex (BRC) in the Eastern Zone of Colombia.

BRC is the most serious disease affecting oil palms in the Eastern Region of Colombia where the incidence covering 25,035 ha in 1999 was 50%. Although the incidence is high, the disease is not always lethal and 80% or more of the palms do recover after 2 to 3 years regardless of whether surgery is carried out or not.

There is no known solution to date in preventing / arresting the spread of BRC. The cost of surgery and sanitary practices in its management can cost as much as USD 300/ha/year. FFB production can drop by 40% and affected palms can have 8% lower oil content.

The incidence in Deli x AVROS and related breeding lines of Malaysian, Indonesian and PNG origin have the highest incidence (40 to 60%) whilst genotypes of La Me and other African origin have a much lower incidence (30 to 40%).

This has implications to the Malaysian seed producers whose planting materials are derived from the susceptible lineages if or when future export of seeds are allowed by the government.

11) Morphological and Physiological Characterization of Oil Palms (*E. guineensis*) for tolerance to Bud Rot (BRC).

CENIPALMA suspects 3 species of fungus implicated with BRC i.e. *Pythium sp*, *Thielaviopsis paradoxa* and *Fusarium solani*. Screening of palms for resistance was initiated to include resistant palms into the breeding programmes. Palms, which showed tolerance, had more stem girth and root turnover compared those which were susceptible.

12) Commercial Management Programme of *Leptopharsa gibbicarina* (Hemiptera: Tingidae) with the ant (*Crematogaster spp.*) in an Oil Palm Plantation.

L. gibbicarina is a bug, which is the vector responsible for the transmission of Pestalotiopsis disease. The traditional method of controlling this vector involves the use of root feeding technique with systemic insecticides. This is expensive and as such, a more sustainable approach was adopted using the ant *Crematogaster spp* that is the natural enemy of *L. gibbicarina* in an integrated biological control programme. Three species of *Crematogaster* have been identified in Colombia. They are: *Crematogaster crinosa*, *Crematogaster distans* and *Crematogaster compleja*. Beneficial plants, which are known to harbor and promote the ants, were propagated in the plantation.

SOCIETY NEWS

PUBLICATIONS

Nil.

MEETINGS

The Society held its Annual General Meeting on 23rd August 2001 at Mutiara Hotel (formerly Hilton), K.Lumpur. The President for the new two-year term is Prof. Dr. Jalani Sukaimi, Senior Research Fellow at the Malaysian Palm Oil Board (MPOB).

SYMPOSIA, WORKSHOPS, ETC

In conjunction with the ISOPB AGM, a seminar was organized on oil palm breeding which involved the presentation of two invited papers. The first paper was by Dr. A. Razak Purba from IOPRI, Indonesia entitled: "Improvement Of Reciprocal Recurrent Selection Scheme Used In IOPRI's Oil Palm (*E.guineensis*) Breeding By Using Selection Index And Molecular Markers." The second paper was by Mr. Mukesh Sharma from United Plantations Bhd, Malaysia entitled: "New Parameters Of Interest In Oil Palm Breeding."

There has been suggestions from some members to hold a ISOPB Seminar in Thailand, followed by a visit to the oil palm growing areas in Karibi or even the Horticultural Research Station in Surathani where the Kigoma materials selected for high altitude (from ASD) have been planted. Others have suggested to hold the Seminar at Medan in Indonesia followed by a field trip to Marihat and the IOPRI Station. Because the tentative period for the Seminar would be around November 2002, we would appreciate your views on this proposal and request that you forward your views to the Secretary of ISOPB.

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