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MEOA BULLETIN

THE MALAYSIAN ESTATE OWNERS' ASSOCIATION

www.meoa.org.my

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Editorial

Message from the Editor …

Welcome to this issue of the MEOA Bulletin for the year 2019 …

To start off, with an "all new" Malaysian government put in place by Malaysians on 9th May last year came a new minister overlooking our industry… and MEOA, almost immediately, went to work by meeting up with our 'new' Minister of Primary Industries, YB Ms Teresa Kok on 9th July 2018. Jacqui Foo therefore reports on how the association introduced ourselves and conveyed our views of the major relevant issues facing the Industry to the Minister.

Next our President, Jeffrey Ong informs us about the Montfort Youth Training Centre – and the **MEOA Oil Palm Conductorship Programme 2019/2020** it will be hosting with MEOA support.

To keep members educated, updated and informed on developments in the field with respect to oil palm plantings, we have reprinted some articles by Dr. Chee KH on **weevils and the pollination role they play**. This is particularly relevant when we see poor pollination during very high rainfall periods -in parts of Sabah especially.

We have also covered the Field Trip to the **AllCosmos Bio-Fertilizer Plant** where microbes are incorporated into fertilizer mixes. Alex Tan gives us the heads up on what microbial power is all about! There's also an article here by Tang Sew Hong on how microbes help in Ganoderma control.

There was another visit to a fertilizer plant… this time to **Behn Meyer's Pulau Indah Fertilizer Plant** in conjunction with Behn Meyer's Launch of its IMPACT Premium Compacted Fertilizer range. YS Siow tells us more about this.

The well-known writer amongst us, En. Mahbob Abdullah, shares his long experience (and that of others as well!) in managing and dealing with people on (and off!) estates, giving us his tips on **how to get estate staff and workers to stay**. We still live and *need* to learn from some past management styles!

To close, we report on the **Golf Tourney** (our 34th!) that MEOA organizes as a fun activity for members to participate and socialize amongst ourselves (plus to raise some funds in the process!). Kenneth Jacobs did a great job putting this game together.

So as always, *happy reading* …

- **Amit Guha**

BULLETIN TEAM

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MEOA'S MEETING WITH THE MINISTER OF PRIMARY INDUSTRIES, YB MS TERESA KOK

ON 9TH JULY 2018

By Jacqueline Foo

Introduction

With the unprecedented change of Government following the nation's fourteenth General Elections on 9th May 2018, there was of course a complete change of all Ministers. Some of the ministerial positions – those deemed 'key' - were filled considerably earlier, those deemed less critical were filled later. The ministry concerned with our industry, the growing and production of agricultural commodities - mainly palm oil, rubber, timber and cocoa, fell into the latter category despite the vital and indisputable importance of palm oil to the nation's wealth. Industry players waited with barely concealed impatience to learn the identity of the new minister.

In the meantime, there was much speculation as to who would be the successor to Datuk Mah Siew Keong, Minister of Plantation Industries and Commodities under the previous government. Rumours abounded, most interesting of which for this writer was the whisper that the new Minister would be female. And so it proved. On 2nd July 2018, YB Ms Teresa Kok assumed her duties as the new Minister for Primary Industries, which was the 'new' name given to the ministry responsible for the country's major plantation commodities of Palm Oil and, to a much lesser extent, Rubber, Cocoa and Timber. (We speak here of 'new' name in inverted commas because it was actually a reversion to the earlier name under which the ministry had operated for decades before it had been renamed 'Ministry of Plantation Industries and Commodities' a few years earlier).

MEOA's Working Committee had submitted our request for an early meeting with the new Minister in order to introduce ourselves and convey our views of the major relevant issues facing the Industry. Association representatives had already met with the new Minister of Human Resources, YB Mr M Kulasegaran, through the good offices of our Honorary Secretary Lim Ban Aik, to put across the reality on the ground of the acute labour shortage faced in the plantation sector, the difficulties faced by the Industry in procuring sufficient foreign workers for our estates, and the consequences for the Industry and the national economy.

It was nevertheless a great surprise when we were informed on Friday 7th July 2018 that a meeting had been arranged with the new Minister, for the afternoon of Monday 9th July. This meeting had been facilitated by Ms Ng Yeen Seen, CEO of the Centre for Research, Advisory and Technology ("CREATE"), and a contact of Working Committee member Datuk Dr Jessie Tang. A few telephone calls by the President to various mainly KL-based members secured the Association's representatives for the meeting with our new Minister. These six members were to be: Jeffrey Ong as President and Gan Tee Jin as Vice President II, and - listed hereafter by seniority (not necessarily beauty or brains!) - Khoo Khee Ming, Mark Chang, Jacqueline Foo, and Gary Gan.

Preparation

Over the weekend preceding the meeting with the Minister, Mr Khoo Khee Ming ("KKM") and this writer huddled with our President to draft our presentation to the Minister.

At around noon on the day of the meeting, the six representatives gathered at the coffee house of the Putrajaya Marriott Hotel to run through the up-coming presentation to the Minister, and the delegating of responsibilities between different MEOA representatives. Prior to departing for the Ministry of Primary Industries, we met up with facilitator Ms Ng Yeen Seen who would take us to the Minister's office and sit in as an observer during our meeting with the Minister.

MEOA REPRESENTATIVES READYING TO MEET WITH THE NEW MINISTER

Standing *(l-to-r)*: Mr Khoo Khee Ming, Facilitator Ms Ng Yeen Seen, President Mr Jeffrey Ong, Mr Gary Gan, Mr Mark Chang.
Seated *(l-to-r)*: Ms Jacqueline Foo, Mr Gan Tee Jin.

Meeting the Minister

Upon arrival at the Ministry with time to spare, we were immediately shown into the meeting room where our Gen Y member, Gary Gan, proceeded to set up the equipment for the slide presentation, and we took our seats around the meeting table.

Setting up for the meeting …

The Minister then arrived with her Press Secretary, Ms Jane Ritkos. Following introductions by the President of the MEOA members present, YB Minister explained that having no background in and previous knowledge of plantation industries and oil palm, she was now trying to familiarize herself as speedily as possible with her new portfolio, and the familiarization process involved hearing the viewpoints of the different players in the Industry. In her first week in office, she had already met with one oil palm interest group, and had meetings lined up with other associations.

Introducing MEOA

MEOA President Mr Jeffrey Ong then kicked off by giving a brief introduction of the Association:

- Founded in 1931, and therefore in existence for 87 years;
- Membership is drawn from owners of small and medium-sized plantations in all states of Malaysia except Perlis;
- Corporate members are mainly private companies, although a few are public listed companies;
- MEOA members by and large are involved with cultivation of Oil Palm, although a few members still have holdings of Rubber;
- MEOA members own 1.2 million hectares of Oil Palm estates, or 20% of planted Oil Palm area in Malaysia;
- MEOA's over-arching objective as stated in its Constitution (1931) and Bye-Laws (1987) is "…to promote, foster and protect the interests of the plantation industry in Malaysia";
- MEOA organizes regular seminars and workshops for its members to ensure they are kept up-to-date on newly implemented administrative requirements such as Minimum Wage, and on technical matters such as Manuring, Pest and Disease Control, Mechanization, as well as field visits to places of interest;
- MEOA also engages closely with other industry players on matters of mutual interest, aiming to 'deliver shared values' across our industry;
- MEOA has been active in issuing press statements on issues affecting our industry, aiming to position the Association as a 'voice of reason' in the industry.

The Oil Palm Industry Today and its Importance to Malaysia

Accompanying his presentation with the slides prepared by past President Mr Joseph Tek and used by him at the MEOA's Stakeholders' Cocktail Reception in November 2017, the President next took the meeting through the salient points of the Oil Palm Industry today.

- Agriculture accounts for 5 billion Hectares or 37.4% of total global land area of 13.4 billion Hectares;
- Of the land under agricultural use globally, livestock or pasture rearing takes up 69% or 3.45 billion Hectares, and cultivation of crops the remaining 31% or 1.55 billion Hectares;
- Total area under Oil Palm globally is 19 million Hectares or 0.4% of global agricultural land;
- Palm Oil produced from area planted with Oil Palm comprises 30% of total global edible oils produced and 55% of edible oils consumed;
- Oil Palm is the highest yielding edible oil-bearing crop per planted unit area, producing 4 to 8 times as much as other plant-based edible oils;
- In Malaysia, area under Oil Palm makes up 0.1% of global agricultural land, and produces 10% of global edible oils, and 20% of edible oil consumed globally;
- In Malaysia, there are 650,000 smallholders cultivating 35% of total planted area;
- In Malaysia, there are 4,000,000 people involved in the supply chain, directly and indirectly.

Critical Issues facing the Oil Palm Industry in Malaysia

These were identified and presented as

- Labour

  The acute shortage of workers in our sector has been an on-going issue for several years, and the reluctance of Malaysians to work in agriculture is now widely accepted as a reality, hence the need for foreign workers. However, the procedure for applying for, getting approval for, and bringing in foreign workers is lengthy and complicated. The Association had already met a few weeks earlier with and made representation to the Minister of Human Resources Mr M Kulasegaran, and mooted the idea of a one-stop centre for processing applications for foreign workers for the plantation industry. The lack of labour has led to loss in productivity, and losses in quality and reputation of Malaysian Palm Oil.

- Mechanization

  The lack of labour on the estates has driven estate owners to mechanize certain estate activities such as collection and loading of harvested Fresh Fruit Bunches and application of fertilizers. However, the activity that has yet to be mechanized is harvesting, and any attempts to date have focused on mechanical harvesting tools that are heavy for the harvester to carry and use and that continue to require one human operator for every tool. It was suggested that small research and design companies in China and possibly Israel (though that would be a politically contentious issue) be identified and approached to come up with a solution for a mechanized harvester, with prize money of RM80 million to make the task sufficiently attractive. These funds could be sourced from payment by producers of RM4-00 per MT of CPO produced in one year.

- Taxes & Cesses on the Industry

  Once again, MEOA representatives highlighted the unfair and heavy taxes and cesses levied on the Industry: apart from growers paying Income Tax, there is the Windfall Profit Levy which kicks in when CPO prices reach a thresh-hold level of RM2,500 per Metric Ton, and for East Malaysian growers, additional Sales Tax of 7.5% in Sabah and 5.0% in Sarawak, both levied on *revenue* rather than profit. Planters have been objecting vociferously for several years to being taxed on *assumed* rather than actual profit, but these objections thus far have fallen on deaf ears.

  The CPO export tax structure was also highlighted: the current tax structure puts Malaysia at a disadvantage to Indonesia which enjoys a different tax structure that allows them to sell CPO at a lower price in international markets. While the Malaysian Palm Oil Council (MPOC) has been diligent in opening up new markets for Palm Oil, it is the Indonesians who have cornered these markets based on price. The price differential between Malaysia and Indonesia is now so marked that Malaysia's locational advantage (being closer to the major markets of China and India, with concomitant lower freight charges) is today no longer relevant. As such, Malaysia is losing global market share to the Indonesians.

- Global Image of Palm Oil

  The bashing of Palm Oil by NGOs on the environmental and health fronts – Deforestation, *orang utan*, indirect land use change concerning the environment, and 3MCPD and saturated fats (once again) concerning health - was raised. The urgent need to counter these allegations with the good story we have to tell was noted.

- Structural Problems in the Ministry

  In order to correctly reflect its vital importance to the national economy, the Ministry should be manned by dynamic, dedicated and forward-looking officials who would formulate and implement policy decisions with respect to the Industry, oversee the statutory bodies falling within the Ministry's ambit - such as MPOB (research and development, plus licensing), MPOC (promotion and image), and MPOCC (certification), and bring credit to the Minister, Ministry and the Industry - along the lines of the Ministry of Trade and Industry (MITI) as in the past

THE MINISTER EMPHASISING A POINT …

The Minister's Response

The Minister said she was aware of the acute shortage of labour on estates as this matter had been raised by other associations and Industry interest groups she had met with thus far. She gave the undertaking that she would liaise with the Minister of Human Resources to try to ease the situation for estate owners.

On the matter of unfair and excessive taxes and levies being imposed on the Industry, the Minister said it was unrealistic to expect any reduction in the current taxes and levies given the dire situation of the economy, as inherited from the previous government and of which all Malaysians were aware.

As the Minister had another meeting to attend, the President on behalf of MEOA expressed our sincere thanks for the opportunity to meet with the Minister, and we availed ourselves of a few more minutes of her time for photo opportunities with our new Minister, YB Ms Teresa Kok.

Montfort Youth Training Centre

MEOA Oil Palm Conductorship Programme 2019/2020

Dear MEOA Members,

Montfort Youth Training Centre (MYTC) - MEOA Oil Palm Plantation Conductorship Programme 2019/2020

MEOA has initiated and agreed to a partnership with MYTC (http://www.montfortsabah.org/) to introduce a two-year Oil Palm Plantation Conductorship Programme in Kinarut, Kota Kinabalu in Sabah. In addition, both IJM Plantations Berhad and Eurostar Tractors will also render local support as partners. The objective of embarking into this skill is part of the association's initiative to respond to the market demand for trained and skilled local manpower for the oil palm plantation industry in Malaysia. MEOA will contribute in providing the leadership, knowledge sharing and providing start-up funding for the above initiative. This will be MEOA's social responsibility in plantation human resource development.

Background

MYTC was first established in Sabah back in June 1999 by the Brothers of St Gabriel with the aim to reach out and provide foundational education and industrial skills development to underprivileged youths. Eligible trainees will be youths between 18 to 20 years with priority accorded to those who are orphaned, from poor and large families particularly from the rural and interiors areas. Currently, MYTC conducts 4 skills development training over 2-years residential care programmes, namely in **Motor Mechanic, Shielded Metal Arc Welding, Refrigeration & Air-conditioning Mechanic and Furniture Making**. In addition, the trainees are also nurtured in English language, arithmetic and computer knowledge. Equally important is the character building, instilling discipline and guidance. Since its inception, MYTC has uplifted and empowered hundreds of youth. Many have graduated and were able to secure employment with established companies throughout Malaysia. The **MYTC-MEOA Oil Palm Plantation Conductorship** will be its 5th skill development. This pilot programme is scheduled to start on **6 July 2019**. **Refer to the attached brochure**. *(or our Secretariat)*

Sponsorship

During the MEOA Council meeting held on 2 November 2018, the MEOA Council has approved a contribution of **RM50,000** as start-up sponsorship for the above initiative. This funding will be channelled from the MEOA's Education Fund, in which funds were generated from MEOA's annual golf tournaments in the past.

I would like to appeal to our MEOA members and other partner sponsors to add on to the above contribution. Let us help to make a difference in the society by contributing to the success of the above MYTC-MEOA Plantation Conductorship programme.

Important to note that all cash donations received by MYTC are **TAX EXEMPTED** under Section 44(6) of Income Tax Act 1967, Ref.: **LHDN.01/35/42.51/179-6.4924** Warta Kerajaan No. 5879 dated 8th May 2003. Official receipts will be issued.

I am affirmed that the above partnership will help to form a commendable platform for MEOA and its members to work with MYTC. It will showcase our outreach initiative and purpose-driven engagement towards the development of the less privileged youth of our society into skilled workers for gainful employment in the plantation sector and be upright citizens of Malaysia.
Thank you for considering this opportunity.

Yours sincerely,

JEFFREY ONG
President

What Happens to Weevil Pollinators?

By Dr Chee Kheng Hoy, FISP

[This article was first published in The Planter, Vol. 93, No. 1100, November 2017.
Re-produced in this Bulletin with permission from Incorporated Society of Planters]

Of concern to planters is that oil palm fruit set has declined. The implication is drop in fresh fruit bunch (FFB) yield, affecting plantation revenue. The cause is probably 'under-performing' pollination weevils (*Elaeidobius kamerunicus*). Why this is so? The answer is possibly due to physiological changes of the insect resulting in the slowing down of activities; possibly also a reduction of reproduction ability thus producing fewer progenies; or the environment is becoming hostile to them.

The article on 'Oil Palm Pollination Weevil Revisited' in this issue of *The Planter* (pp. 761-771) raises questions that require answers. The main question is: do we know enough of the weevils' behaviour and their activities in relation to environmental conditions. Further studies should enable us to take appropriate measures to restore the potential fruit set level.

E. kamerunicus was introduced from Cameroon, 35 years ago, in 1982. It is not unlikely that the phenomenon of climate change has changed the life style of the weevils. The change could be irreversible if after appropriate agronomic measures taken there was still no improvement.

The present scenario is that the number of weevils may be too low to effect adequate pollination for good fruit set. The possible reasons immediately come to mind is that in order to achieve high FFB yield, modern planting materials produce more female inflorescences and much less male inflorescences denying weevils of food and breeding sites. Further, the application of cypermethrin, chlorantraniliprole or *Bacillus thuringiensis* for pest control may affect the survival of weevils.

This is evidenced by the improvement obtained from the 'hatch and carry' technique. However, since pollen is so crucial for fertilisation of female flowers, old data on the number of pollen on individual weevil should be re-examined. Similarly, the viability of pollen should be verified.

There is a need to find out how critical is the intensity of anise odour to lure the weevils. Experiments showed that bigger fruit bunches are more effective in attracting the weevils than small fruit bunches. Apart from smell, an entomologist mentioned that the colour of flowers attracts the weevils. There is no evidence for this. More oil palm planting countries should carry out research on pollination insects and fruit set.

Precise information on the effect of climate on weevil activities is lacking. Statements of climate effect are often contradictory. As planters can multitask, they can certainly make observations and gather information during the course of their duty. This is a realistic approach instead of leaving to entomologists to discover climate insensitive insect pollinators.

Pollination occurs on female inflorescences. It is logical to study more on the visitation of male and female weevils on female flowers. This requires perching on the oil palm canopy with a note book – an experience hard to come by.

The few examples given above, illustrate that there are many projects that we can do to help improve pollination and ultimately good fruit set.

Weevil pollination problem is also a fruit set problem. To tackle and resolve the pollination problem is to enhance fruit set. Research projects on weevil pollination are short-term and require minimal outlay of resources. The only indispensable simple requirement is the availability of research personnel. Post graduate students should take up the challenge. Research grants are readily available. Universities and plantation research centres would be happy to participate.

Oil Palm Weevil Pollination Revisited

By Dr Chee Kheng Hoy, FISP

[This article was first published in The Planter, Vol. 93, No. 1100, November 2017.
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The weevils, Elaeidobiuskamerunicus *arrived in Southeast Asia from Cameroon over 30 years ago. Consequently, oil palm pollination has improved greatly resulting in a quantum jump in FFB yield. However, despite the presence of the weevil, there has been occurrence of poor fruit set in Malaysia and Indonesia on both newly matured and older palms in recent years causing major economic set back. The behaviour of* E. kamerunicus *in time and space was examined to uncover further research to restore the potential productivity of the oil palm. Existing information on other pollination insects are reviewed to facilitate a second introduction of pollination insects if necessary.*

Keywords*:* Elaeidobius kamerunicus*, weevils, pollination, fruit set.*

Oil palm are monoecious plants. Their male and female flowers are borne on separate inflorescences of the same tree. Pollen from separate trees is required to effect cross pollination.

Initially it was thought that oil palm relied on wind pollination as insect pollination was not obvious. Malaysia has its natural insect pollinators i.e. *Thrips hawaiiensis* and possibly also the moth *Pyroderces* sp. but they were found to be less efficient. To improve pollination, and therefore, fruit set and fresh fruit bunch (FFB) yield, hand pollination was practiced.

The oil palm industry owes much to two gentlemen who effected insect pollination and thus high oil palm yield. Leslie Davidson of Unilever Ltd. (plantation group) observed that in Cameroon even during rainy season oil palm fruit set was normal, indicating oil palm is mainly insect pollinated. Davidson instigated the setting up of a project on insect pollination. Thus, Dr Rahman Syed from the Commonwealth Institute of Biological Control was engaged to carry out the project. From 1979 to 1981 a wealth of results was generated for the first time on oil palm insect pollination in Cameroon and Malaysia. Dr Syed later served as a consultant to Lonsum Plantation in Indonesia to continue his work in weevil pollination and pest control.

In Cameroon, Syed (1982) found numerous insect species visiting anthesising male inflorescences and receptive female inflorescences. Activities were noted in *Elaeidobius* spp., in particular *Elaeidobius kamerunicus* (*Figure 1*). *E. kamerunicus* (*Figure 2*) carries the largest number of pollen grains (Syed, 1979) and exhibits good searching ability (Syed, 1982).

E. kamerunicus was brought into Malaysia in 1980 and released in oil palm estates in 1981. It multiplied and spread rapidly, and it is now present throughout the world where oil palm is planted. Kang and Zam (1982) showed that *E. kamerunicus* was unable to complete its life cycle on any other plant species except the African oil palm, *Elaeisguineensis*and thus it would not be an ecological risk to introduce it to Southeast Asia.

E. kamerunicus contributes to good fruit set which is a prerequisite to high oil yield. Over the first seven months of 1982 in Malaysia, total oil yield was 20 per cent higher in Peninsular Malaysia and 53 per cent higher in Sabah (Syed, 1982). Increased fruit set resulted in higher fruit/bunch ratio, mean bunch weight and yields, oil/bunch was increased in younger palms but not in the older palms.

Indonesia is the world's largest palm oil producer. At the PIPOC 2017 its researchers commented that pollinating weevils contributed a large amount of additional revenue every year to the country's oil palm industry.

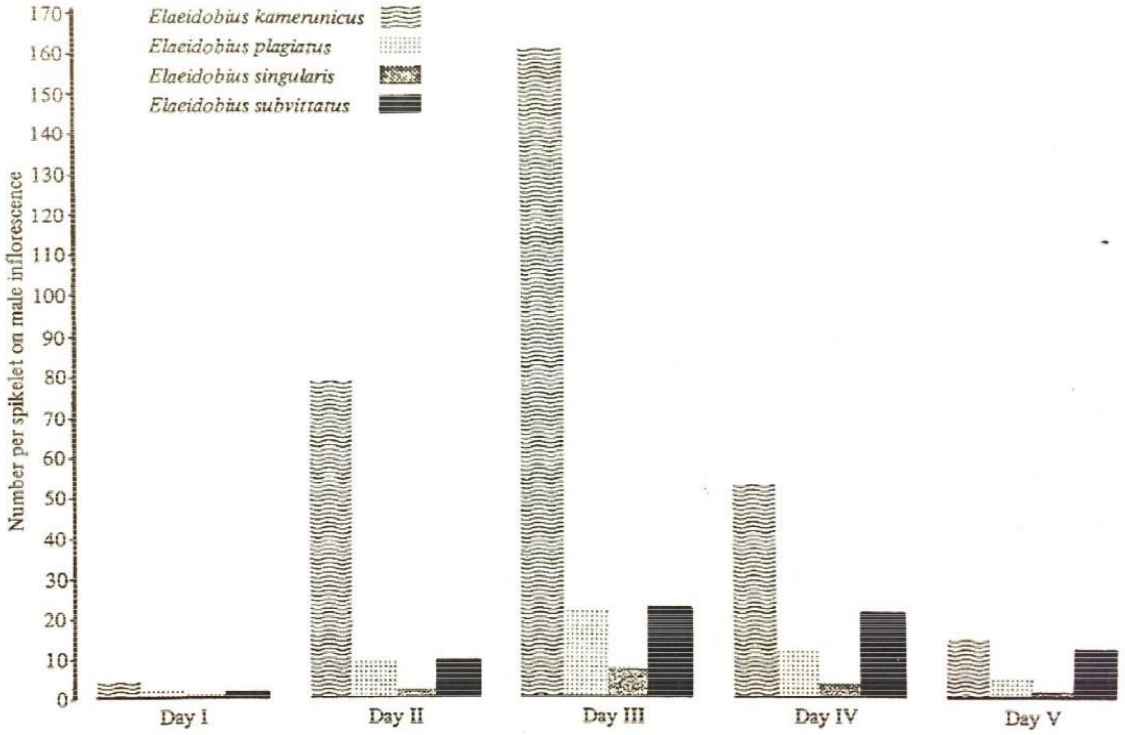

Figure 1 Number of Elaeidobius spp. on anthesising male inflorescences of oil palm.
(Based on means of monthly samples during Feb and during Jun to Oct 1979, at Lobe Estate, Cameroun).
Source: Syed (1982)

WEEVIL POLLINATION RESEARCH IN CHINA

China has 42,000 ha of oil palm in Hainan island, planted on previous rubber land. Weevil pollination research has been carried out, and their research findings are somewhat different from Malaysia (Yue *et al*., 2015).

The climatic conditions in Hainan are different from other major oil palm growing countries. Thus the population dynamics and activity of *E. kamerunicus* are expected to be different. Seasonally, two high peaks of adult weevil emergence from the spikelets occur in April and in October (Yue *et al*., 2015). Study of weevil pollination in Hainan is best undertaken to coincide with periods of high weevil activities.

Nowhere except in Hainan was it mentioned that the number of female weevils is always greater than that of the males. For example, on the third day of anthesis of male inflorescences, the adult weevils were very active between 1100 h and 1200 h and between 1730 h and 1830 h. The total number of weevils reached a maximum of 515 at 1130 h, of which 400 were females and 115 were males. One would expect that more females mean more oviposition and higher reproduction rate.

Adult weevils were most abundant on female flowers on the second day of anthesis and the number of females exceeded that of the males. This observation does not seem to have been reported elsewhere. Contrary to other observations it indicates that female flowers do not appear to repel visiting weevils (Syed, 1982).

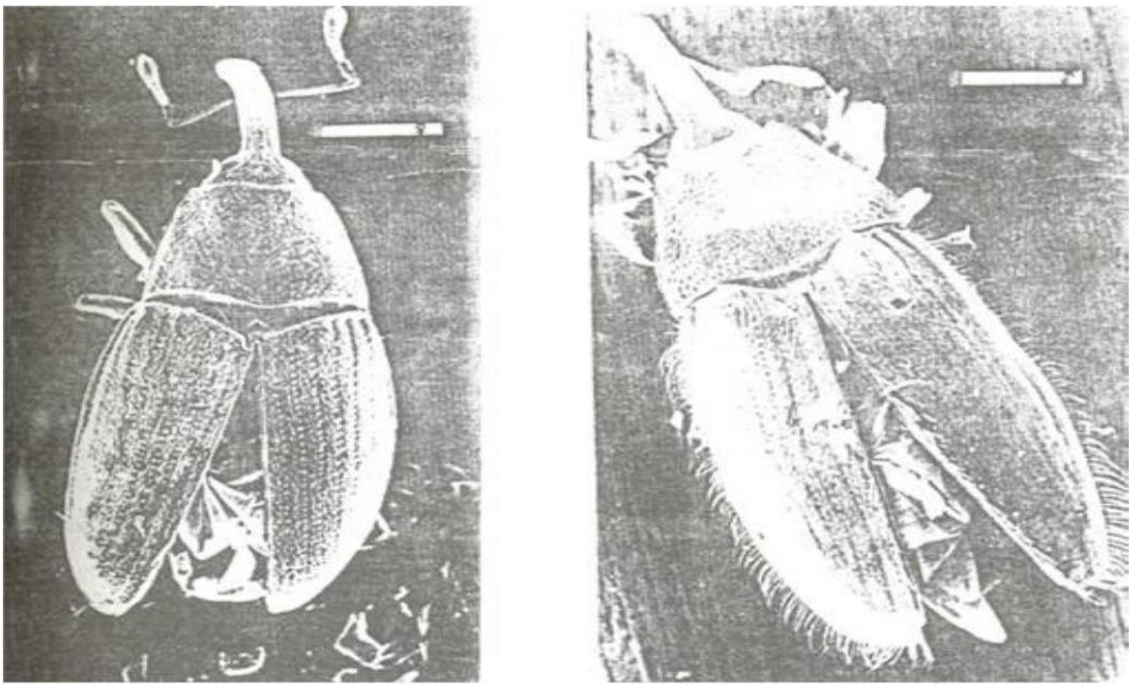

Figure 2 **Elaeidobius kamerunicus***: Adult female (left) and adult male (right).* *Both scales represent 0.5 mm.*

The male has shorter proboscis and is larger than the female. The male has a row of hair (0.2 mm long) flanking the margin of the elytra and a turf of protruding setae on the middle of the elytra, while the female has not. Also note the male has two ridge-like bumps on the upper surface of the elytra close to the head capsule

Adult weevils, though, are most likely to stay on the spikelets of male and female inflorescences until mating at dusk. Presumably fertile females if they are on the female flowers will fly to the male inflorescences to deposit the eggs.

In Hainan, the number of weevil's peak on the third day of anthesis of male flowers and on the second day of female flowers. This seems to be related to the emission of anise-like odour which is strongest on third and second day of anthesis of male and female flowers respectively. The number of adult weevils at 1100 h was 1.8 times greater than at 1800 h, possibly because the adult weevils were feeding on the nectar in the flowers. Female flowers had much nectar at 1100 h (Yue *et al*., 2015).

The main volatile constituent of the anise scent was identified by Dr Gee Ping Tou of IOI laboratory as 'estragole 56' (Chee & Chiu, 1998). It will be profitable to study this compound further or to confirm its attraction to pollination weevils. Indonesia has formulated this scent/estragole for commercial use to attract weevils (Norman, *pers comm.*).

RECURRENCE OF POOR POLLINATION

After years of high yield following the introduction of *E. kamerunicus*, there have been reports of decline of yield due to poor fruit set. Reduction of oil palm productivity is closely related to poor fruit set that lead to development of malformed and 'thorny' bunches and decreased fertile fruitlets. Poor fruit set usually occurred in newly opened plantations and modern planting materials with reduced male inflorescences (Prasetyo*et al*., 2012). Prasetyo *et al*. (2014) also reported that several areas in Indonesia only achieved 10 per cent or less of fruit set.

How to measure Fruit Set?

According to Hardon (1973), fruit set is defined as the weight of fruit expressed as the percentage of weight in relation to the bunch weight. Pollination of oil palm is considered satisfactory if the weight of fruit constitutes 60 per cent of the total weight. Fruit set can be up to 80 per cent and more.

The Malaysian Palm Oil Board (MPOB) adopts an improved method to measure fruit set whereby both the fertile fruits and parthenocarpic fruits are stripped from the bunch and counted.

Fruit Set value is calculated using the following formula:

Fruit Set =

No. fertile fruits /
(No. fertile fruits + No. parthenocarpic fruits)
× 100%

Adopting the improved method of measuring fruit set, MPOB conducted a survey to find out if low fruit set is a national phenomenon, recurring throughout the year or just seasonal. The respondents, 183 in all, did not give sufficient information and the survey is extended to December 2017 (Anon, 2017).

ELAEIDOBIUS KAMERUNICUS

LIFE CYCLE

Syed (1982) provided a detailed description of the life history of *Elaeidobius* spp. The adults of *E. kamerunicus* chew anther filaments or anther tubes of opened male flowers and feed on anther filaments. They do not feed on pollen grains. They mate any time of the day, usually two to three days after emergence. Oviposition starts within two days and the eggs are deposited in the feeding pits by protruding the ovipositor. The tissue surrounding these pits dries up, hardens and shrivels, thus providing some protection. There are three larval instars. Pupation takes place in the consumed flower.

The life cycle of *E. kamerunicus* is about 12 days in the lowland and 30 days in the highland. The number of eggs laid during its life is about 69 - 252 eggs (average 198). In a day average number of eggs laid is four eggs in the lowland and three eggs in the highland (Perdana *et al*. 2017) (*Figures 3 -5*).

Between 0700-0730 h and 1700-1730 h there is little weevil movement, but the weevils tend to aggregate around the base of spikelets or are well distributed along the spikelets. They are very active between 1100 - 1200 h (Chiu, 1984). After 1730 h there is virtually no weevil activity and the weevils present in the field are found resting on the anthesising male inflorescences.

Weevils spend little time on female inflorescences

Female inflorescences have the same anise scent as male inflorescences and the weevils apparently visit them only by accident while in search of male inflorescences, but fly away after a few minutes although a brief visit is sufficient to effect pollination (Syed, 1979). Female flowers do not offer food to the weevils [weevils feed on the nectar of florets in Hainan (Yue *et al*., 2015)]. Laboratory experiment suggests that female flowers probably contain some chemical deterrent (Syed, 1982) which repels *Elaeidobius* species. In Indonesia, recent observations showed that female weevils are greater in number in female inflorescences (Prasetyo, *pers. comm.*).

Figure 3 Emerging new male inflorescence before anthesis

Figure 4 Finger-like spikelets of male inflorescence at anthesis

Figure 5 *Yellow colour anthers of male flowers with many visiting pollinating weevils (Elaeidobius kamerunicus)*

THRIPS HAWAIIENSIS VS. ELAEIDOBIUS KAMERUNICUS

Before the arrival of *E. kamerunicus*, large numbers (approximate 200,000) of *Thrips hawaiiensis* were estimated to visit a single male inflorescence. They also visited female inflorescences - 3.7 Thrips per flower were estimated to be present at any one time, each carrying four to five pollen grains of which 78 per cent were viable (Syed, 1979).

T. hawaiiensis are small and delicate insects that can only be noticed with special search (Chee & Chiu, 1998). They may not be able to compete with *E. kamerunicus* because they are weak flyers, and they are small in size carrying relatively few pollen grains in each individual insect. Nevertheless, it is compensated by their large numbers (Lewis 1973; Idris *et al*., 2016). *T. hawaiiensis* had been important in oil palm pollination, with acceptable level of natural pollination. As expected, their small size restricts them from flying into comparatively open and consequently windy areas.

The weevils are much better adapted to oil palm and, unlike Thrips, are equally effective pollinators on young and old palms. Because both *E. kamerunicus* and *T. hawaiiensis* live in the same flower, competition between them is possible.

T. hawaiiensis is still contributing to pollination but its quantitative contribution although small needs to be ascertained. After 30 over years, the original introduction of *E. kamerunicus* may have adapted to the local environment and changed its behaviour. Since there has been no research on the Thrips after the introduction of *E. kameruncus* a re-look at *T. hawaiiensis* may be useful.

Are there any changes taking place in *E. kamerunicus* after over 30 years away from its native homeland that may affect its pollination performance? Idris *et al*. (2016) compared the morphological characters of the present specimen with that of the Cameroon specimen (on loan from the Department of Agriculture Insect Collection) and found that they were similar in the length and arrangement of bristles and body size.

LEVEL OF WEEVIL POPULATION FOR GOOD FRUIT SET

The mean number of *E. kamerunicus*, or Pollinator Force (PF) per hectare recorded in Malaysia was 2,096 to 13,290. It was lowest in February and March and highest in April and May (Idris *et al*., 2016). The data was within the range suggested by Basri and Norman (1997) which was 4,000 to 30,000 depending on male anthesis stages. To provide60 per cent of fruit set, Donough *et al*. (1996) quoted 20,000 PF.

In Indonesia, weevil population varies from 400 to 12,500; usually ranging from 20,000 to 30,000 per anthesising male inflorescence. Syed and Salleh (1988) found that about 15,000 weevils per anthesising male flowers is needed to pollinate each receptive female inflorescence and effect 50-60 per cent fruit set. For about 70 per cent fruit set 30,000 weevils would be required.

WHY RECURRENT POOR FRUIT SET?

Quantity of pollen of the male flowers has been reduced due to sex ratio skew in favour of female inflorescences. This is particularly so with clonal planting materials. Estates planted with tissue cultured plants are inter-planted with certain percentage of DxP materials to increase pollen availability.

Poor fruit set is correlated with seasonal fluctuation of wet weather, possibly having negative effects on weevil population and pollination activities. Extreme climatic conditions during receptivity of female flowers may affect fruit set (see section on *climatic conditions and pollination*).

Low pollen viability is unlikely to be one of the reasons because weevils carry only fresh pollen in the field. It is easy to verify this by applying a simple agar plate (sucrose 10 g, agar 0.3 g, distilled water 100 ml) germination test.
Rats consume large numbers of larvae, destroying the male inflorescences in the process. Chiu (1984) estimated that up to 80 per cent of weevil larvae might be eaten by rats. Fruit set in Sarawak has always been poor, it is speculated that abundant decaying logs in peat soils may harbour a greater population of rats indirectly increasing rat predation of inflorescences (Paramananthan, *pers. comm*). In Kalimantan, drought and haze were found to partially contribute to the drop in bunch weight during the six months following the phenomena (Chee & Chiu, 1998). A study of ecology of weevils in relation to haze and

environmental pollution has been suggested. Weevils parasitised by nematodes (*Elaeolenchus parthenonema*) seem to be a serious pest problem affecting fruit set. Other enemies include assassin bugs and ants, and spider webs physically preventing weevil pollination. All broad-spectrum insecticides kill the weevils especially cypermethrin which though does not kill the weevils directly affects the activity of the population causing malformed fruit bunches (Chung Gait Fee, pers. comm.). The small numbers of *E. kamerunicus* released in Southeast Asia may lead to inbreeding depression (Caudwell, 2003).

Climatic conditions and pollination

Saharul*et al*. (2017) conducted a population monitoring exercise of *E. kamerunicus* in Sarawak. Three locations having been planted with oil palm in 2010 were selected for the study: Sessang, Kuala Igan and Kenyalang. The average monthly rainfall (mm) for 2015 and 2016 were: 40 (low), 90 (moderate) and 160 (high), respectively. The soils were peat, deep peat and deep peat, respectively. The results showed that the mean fruit set percentage of the three locations were respectively 55, 40 and 50 and the average weevil density per hectare were 24,000, 21,000 and 15,000.

It is **concluded** that:

i. Area with most rainfall has less weevil per hectare,
ii. The weevil density per hectare did not directly affect percentage of fruit set of the area, and
iii. In Kuala Igan which has moderate rainfall, the percentage of fruit set is significantly lesser than the low or high rainfall area.

Sugih*et. al*. (1996) found that *E. kamerunicus* would not be active if the weather was rainy or drizzling, probably due to very high air humidity that restricts the weevil's movement.

In Cameroon, it was found that 80-85 per cent of bunches were pollinated during the wet season compared to 77-82 per cent during the dry season (Syed, 1979). Rainfall washes away pollen from the atmosphere but it could also possibly transfer pollen from tall trees to adjacent trees and pollinate female inflorescences adequately.

In Perak, where there had been periods of heavy rain, the weevil population had remained relatively high. The population was also found to be favourable in a dominantly dry area of Negeri Sembilan (PORIM, 1982).

The most important characteristic of pollinator *E. kamerunicus* is its capacity of carrying pollen – an adult male carries an average of 235 pollen grains, a female 56 (Moslim & Norman, 2016). In India, Dhileepan (1994) studied a 40-ha oil palm plantation in Kerala state and found that anthesising male inflorescences released 20-25 g of pollen to the atmosphere over a period of four to five days. Weevil population fluctuated, being highest during the wet season, and lowest during the dry season (3-4 months). However, fruit set declined during the wet season, this was attributed to some pollen carried by the weevils having germinated. Normal fruit set occurred during the dry season.

There are also contrary observations that rainfall or even drizzle restricts weevil activity. Poor fruit set in peat area is thought partly attributed to persistent high humidity restricting *E. kamerunicus* movement as well as the viability of pollen.

Rain has an effect on evaporation; slow evaporation may cause the inflorescences to dry up sooner after full anthesis.

Poor fruit set in young plantings

Fruit set of palms below eight years old are generally low, possible reasons are:

- Stronger wind velocity in open field of young palms restricting weevil activity as well as dislodging more pollen from anthesising male inflorescences to the atmosphere,
- The strength of anise aroma emitted from small inflorescences is inadequate to attract the weevils. This was shown in an experiment (Syed, 1979) by placing side by side one larger inflorescence and two smaller inflorescences together, the larger inflorescence attracted three to four times more weevils than the two small inflorescences combined. Synchronised opening of inflorescences will intensify the anise scent. Laboratory experiment may be carried out to test if anise scent extracted from plants or chemically synthesised will have the same effect to lure weevils, and
- If ablation is carried out to improve vegetative growth and subsequently bunch size, only female inflorescences should be removed – male inflorescences are to be retained to build up the weevil population.

Hatch and Carry Technique

As part of fruit set research and to improve pollination and restore yields, Foong*et al*. (2004) resorted to supplementing and protecting oil palm pollinating weevils in young mature palms in Sabah. In Indonesia, plantations implement the hatch and carry technique with admirable result (Prasetyo *et al*., 2014). The technique involved allowing the larvae and pupae of *E. kamerunicus* in post anthesis male inflorescences to hatch in boxes. The hatched adults were sprayed with viability tested pollen in talc and released. Two months later 20-fold increase in weevil population per hectare was reported. Fruit set increased to 15-21 per cent (Prasetyo*et al*., 2014).

SECOND INTRODUCTION OF POLLINATING WEEVILS

After successfully introducing *E. kamerunicus*, Syed (1982) added a statement that if *E. kamerunicus*is seen to be inadequate, introduction of others could be considered.

In view of current poor fruit set resulting in poorer crop yield and heavy loss of revenue, the **Malaysian Estate Owners Association (MEOA) proposes to embark on a second introduction of pollination weevils**. The proposal also suggests more studies in the meantime to determine the factors causing poor fruit set. A working committee has been formed by MPOB and a survey on the spread and the gravity of the problem is underway.

The search for another suitable insect species for the proposed fresh introduction can be based on the lead by Dr Syed R A– his analysis of the insect species that he studied in Cameroon in connection with the primary introduction of *E. kamerunicus*. The desirable second weevil species should have a good pollen carrying capacity, strong searching ability and high population.

It is known that *Elaeidobius* spp. Carry much more pollen than other insects arriving to oil palm inflorescences (Syed, 1979). *Elaeidobius subvittatus* and *Elaeidobius plagiatus* carry substantial amount of pollen only behind that of *E. kamerunicus, E. singularis* carries the least pollen (Syed,1979).

In an experiment on population dynamics of the weevils, the numbers of three insect species with good pollen carrying capacity arriving at a large anthesising inflorescence were counted. The results show that for *E. kamerunicus* the total number of individuals, male and female combined, was 5698, *E. subvittatus* - 1522 and *Atheta* sp. - 1088. The result shows that *E. kamerunicus* is much more superior, by fivefold to *E. subvittatus*.

This population study also enables analysis of searching ability, i.e. how fast the pollination insect arrives at the site. The time sequence from first to last was *E. kamerunicus*, followed by *E. subvittatus* and *E. plagiatus*. It appears that the limit of searching *of Elaeidobius* spp. is about 1000 m on a dry and comparatively breezeless day.

There is a further species of pollinator to consider. *Prosoestus minor* was found in small numbers in the male inflorescences, but they are present in much larger numbers in female inflorescences, possibly playing a role in distributing pollen within the female inflorescences. This observation provokes renewed research on *T. hawaiiensis* to discover any merits of this insect which have been overlooked.

If the original pollination capability of *E. kamerunicus*is eroded, a fresh introduction of the species can be considered. It has also been proposed to find an insect whose normal pollination activity is not affected by any weather conditions. Desmier de Cheuon (2016) suggests introduction of at least another weevil species to create a pollinator complex similar to that present in West Africa, covering the rainy period (*E. kamerunicus*) and dry period (*E. plagiarism*).

OTHER RELATED INFORMATION

E. subvittatus is the only *Elaeidobius* found in South America. Its freak presence is presumably from accidental introduction by the slave ships. The natural host of *Elaeidobius* spp. is *Elaeis guineensis;* even the closest South American relative *Elaeis oleifera* does not attract it. Amongst the *Elaeidobius* genera, only *E. subvittatus* breeds sufficiently to maintain its population on *E. oleifera* and presumably has a role in pollination. Oil palm breeders seem to think *E. oleifera* is the future star of the oil palm industry because *E. oleifera* has desirable attributes in oil quality and plant architecture which are lacking in *E. guineensis*.

CONCLUSION

Poor fruit set of oil palm is related to the activities of pollination weevils, *E. kamerunicus*. The present review of the literature on the subject would help planters and researchers alike to have a deeper knowledge of the science and can quickly proceed with further investigation to address the problem of declined FFB yield. It seems likely that the problem is too low a population of the pollination weevils and climate changes affecting the stability and behaviour of the weevils. Recommendation of new introduction of pollination weevils from neighbouring small oil palm growing countries and from Africa can be considered.

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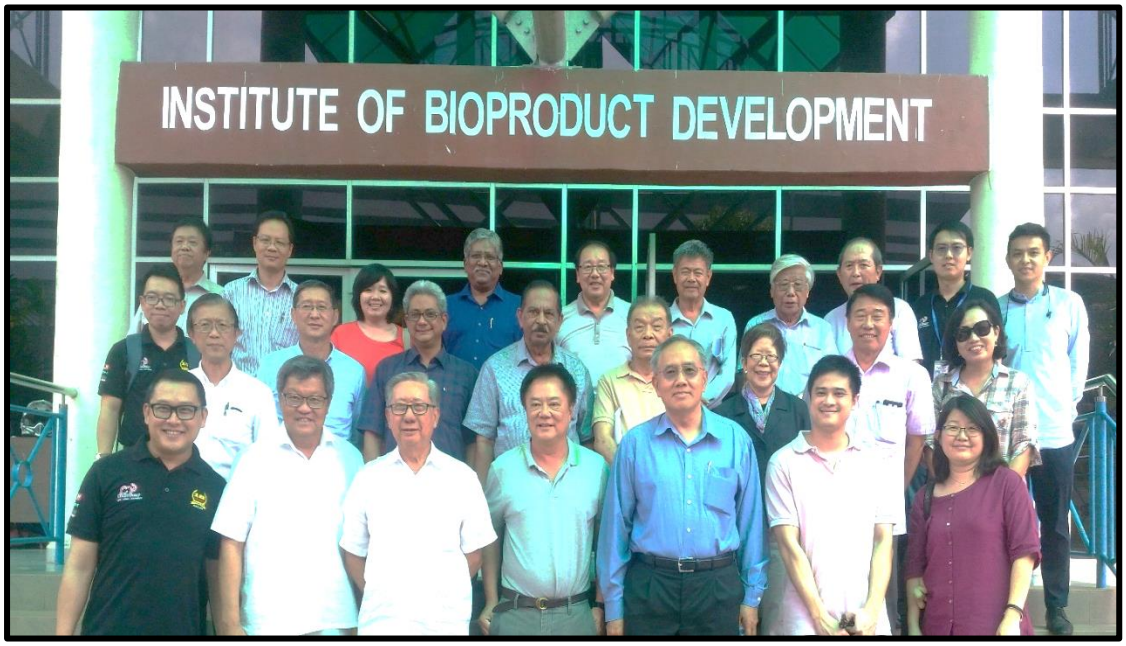
All Cosmos welcomes MEOA members to its Research Facilities & Fertilizer Plant

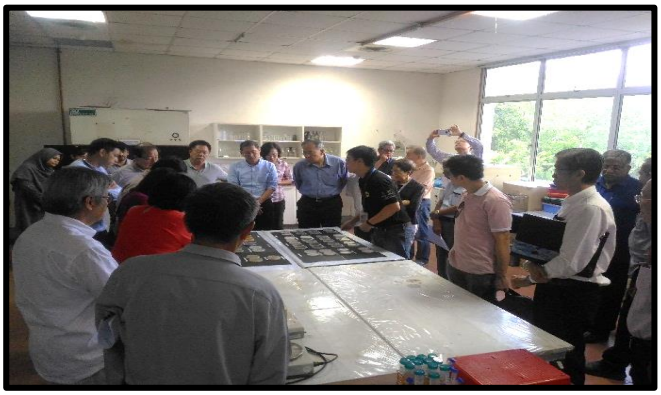
By Alex Tan

It was a fine day on 13th July 2018, and Johor hosted the first MEOA council meeting of 2018-2019 term, followed by a visit to All Cosmos' research facilities and fertilizer plant in Pasir Gudang.



Our first stop was the UTM (University Technology Malaysia) Johor campus, where All Cosmos has its research laboratory that also houses the bioreactor for the production of microbes. Since All Cosmos is one of the major producers of microbes for enhancing crop yield and protecting crop against disease infection, visitors had a chance to listen to a lecture on the recent development of microbiology (Lecture given by H'ng Wei Chang) and to see laboratory work on culturing and testing of beneficial microbes.

R&D Presentation provided by Mr. H'ng Wei Chang.



Briefing on the Effective Micro-organism.

The highlight of the All Cosmos tour was our second stop at the fertilizer factory. For those members who are not so familiar with fertilizer manufacturing, it was indeed educational to see the gigantic heaps of raw materials, both organic and inorganic nutrient substances waiting to be processed and bagged.

Dato' Tony Peng, the CEO of All Cosmos led the factory tour for our MEOA members. He introduced the various operations in the company and how All Cosmos expanded its market share in organic fertilizer, microbial formulations and new products, one of which is the recently launched K-Neutralizer. The product addresses the two important factors determining crop productivity, namely potassium and soil acidity.

Manufacturing plant visit led by Dato'Tony Peng

K-Neutralizer demonstration by Dato' Tony Peng

Getting Your People to Stay

by Mahbob Abdullah

When I was working in estates I knew that my move up would depend on a strong team.

Fortunately, the company knew it too, and they gave the support. For example, I had experienced people to work with me such as two senior conductors in a division of oil palm when I joined, fresh from working in rubber. They were Mr Kenganathan and Edwin Rajagopal who regarded Pamol estate as home. The mandor's too had worked there for many years. In Sabah the company had a plantations manager to support me, Bill Morrison who was once manager in Sungai Mai and Kok For, before he came to work for Unilever. Lau Kok Chin, a graduate from University of Malaya, came from Harrisons and Crosfield, and joined me in Sabah after we worked together in Kluang. In addition, I had two more managers, Julian Stanning, a tall 6 foot 6 with experience from Ghana, and Dr Steve Watson, who came in from the Solomon Islands.

When I moved to Solomon Islands, I had to deal with crops also new to me, coconut, cocoa and cattle, but I had the support of the best coconut and cocoa man on the islands, David Friend, who had his education in Reading - and later in Trinidad. Julian Stanning came over as Plantations Director, and John Clendon was in charge of the 8,000 head of cattle.

When I moved to London, many went on to head other units in the group, Steve going to Congo, Julian in Kenya, and John in Thailand, as head of the team in Univanich, the plantation that once had a joint venture with Unilever.

Unilever had a way to keep its good people, some formalised, and in other ways it was a part of the culture that had built a bond among us.

In the formalised way, the personnel departments would see that those with high performance went on a fast-track list. These were managers who gave attention to details, and through their teams they could get the crop to increase, with prompt rounds and high quality of oil, while staff and workers' turnover were low. They would be sent to management courses including overseas, without them being told why. But generally, they could guess that they were going places, if they kept up their good work.

It was the more informal way that made me smile. Until today I can remember observing the leaders in the industry. They too had their way of keeping their people to make their companies give among the best results in the country. I was told that a top plantations magnate in Ipoh would ask for permission when he was on a Sunday drive, to enter one of his estates and perhaps have a cup of tea, and his manager would of course agree. In the house he would ask questions about the children, while the wife would be serving tea. He might tell one or two stories. Not a word was said about work, before he took his leave. It was his way of showing how pleased he was with the way the manager was running his estate.

The famous Tan Sri Borge Bek-Nielsen was also noted for keeping his good people. I saw in a small way how he did it, at a conference where he had made his speech, and came down to line up for the buffet lunch. He could not stop talking of course, being a great communicator, but he did not forget to stop and take a plate to give to his planter, a few people behind the row, and then went back to his place in the queue and went on talking to the man next to him. That little gesture said everything.

In the businesses of Robert Kuok, he does not count your age, but keeps you on if he wants you to stay.

In the place where I worked, many would have read about my stories on Datuk Leslie Davidson. He had his own special way when working in the Labuk, upriver from Sandakan where he opened the area from jungle. He had a group of people who would stay and work with him to reach the planting targets. He worked with the Hakka community there, who settled and became contractors, and some came up to be shopkeepers along the river. For the workshop, drivers, and foremen, he brought the Cocos people from the failed tobacco plantations by the Segama river. The Cocos came to Sabah from the Cocos and Keeling Islands, and he made sure he got land from the state through Tun Mustapha Harun the Chief Minister. Each family got a loan to build a house, with water tanks to catch the rain, and more loans for seedlings to plant so they would have a stake there. The plantation was so remote that most skilled people could be tempted to work downriver and closer to town. He had a school built for their children and watched how it was doing.

Of course, he joined in with the festivals including Chinese New Year, and Hari Raya. He would jump up on stage to make a speech, and with his knowledge of Hakka, he was a hit with the Chinese community. With his skills in Malay and *pantuns*, the Cocos village would be excited when he began his speech, which was always a great laugh, but interspersed with serious stuff about working together, education and sharing prosperity.

For the management club, he built one that replaced the old hut taken away by the floods. The new one had the longest bar made of thick merbau wood, and a long freezer that stocked beer and soft drinks. He had parties held at the slightest excuse, and for the evening the staff and management were on equal terms, and traded jokes easily, and of course he would have his eyes out for anyone who showed more skills and liveliness than those displayed at work, and would soon place him in a job that would interest him more. The same would be the case when he watched football. He looked for signs of leadership, a team player, and those who kept on fighting when the team was down. His wife Olive, would have the wives for morning coffee by the club, playing gin rummy or pontoon, and their children would be enjoying the swimming pool where the water was as clear as rain.

I have also heard of stories of famous planters, like WL Harvey at Sungai Wangi Estate outside Sitiawan, who became giants in their day. Many of their planters would go on to lead big estates later on. Mr J Morgan, manager of Sepang Estate in 1952 – 1965, was also a famous figure, who spoke Tamil so well the workers referred to him as Tuan Murugan. It was common in those days for managers to be in one place for a long time, and the continuity engendered loyalty among the people working for them, as they would know the names of most of the workers, and even their children's names and how they were doing at school. When there was a wedding, or a crisis, the manager would be there, and showed that he cared.

In many ways those days are over, but the culture and the practices are still useful. The estates can gain so much from experience and continuity. The salaries and perks may follow industry standard but they may not be good enough to get the people to stay. But attention to details on small things that we often forget can make a difference. When someone leaves, usually the gap can cause a drop in performance. It is not easy to find one as effective, even if he has glowing testimonials. New people need a long time to size up, to know their strengths and uncover their weaknesses, and a wrong choice can hurt the business. Many successful plantations companies grow their own people and hardly take on someone new. They would take on only trainees, and develop them into the company culture. This serves as part of a succession plan, and at the same time the more senior planters would know that the young ones are there behind them, more or less ready to take their place if necessary.

On the other hand, there are those in the team who are not pulling their weight or they cannot fit in. In this case they have to be let go. That has to be done to make the team stay strong, but it should be done in the least stressful way. That, too, is an art. ~

Visit to Behn Meyer's Pulau Indah Fertilizer Plant & Launch of IMPACT Premium Compacted Fertilizer

By Siow Yuen Seng

Behn Meyer AgriCare (M) Sdn Bhd invited some MEOA members to attend the launch of its new fertilizer formulation – IMPACT at its Pulau Indah plant on 9 July 2018.

The launch-cum-dinner, following the visit to the Pulau Indah plant during the day, was held at Le Meridien Putrajaya gathered together 400 invited guests from oil palm plantations in West Malaysia and Sarawak.

IMPACT fertilizer, which is a premium quality compacted compound fertilizer, is a new addition to the comprehensive series of fertilizers marketed by the Behn Meyer.

IMPACT carries many premium features and has a series of formulations designed for oil palm in various soil type. Planters can deliver the optimum nutrient requirements to their palms with only 3 – 4 applications of IMPACT fertilizer per year in order to maximize their yields.

IMPACT fertilizer is currently manufactured using the latest modern compaction technology from Germany and China in two plants - one in Lahad Datu, and the latest in Pulau Indah, Port Klang. All the guests were cordially invited to visit the Pulau Indah plant.

The guests were then given an overall view on the manufacturing and technical aspects of IMPACT fertilizer in a presentation by the General Manager (Manufacturing), Mr Albert Heng. He emphasized the continuing role of the company in working with the industry to innovate solutions to problems especially those related to crop nutrition. He highlighted the following premium features of Impact achieved through the special manufacturing process:

- Homogenous nutrient analysis according to specifications
- Hard, dry granules (3 – 7mm) for ease of uniform application
- Contains no urea, therefore minimising N-losses through volatilisation
- All nutrients are fully soluble and plant available
- Most grades contain the micronutrient B (Boron)
- Customised formulas with minimum quantities are possible.

Souvenir – "Impact Fertilizer" Paperweight

Ganoderma Control – A Natural Way with Microbes

By Tang Sew Hon

Sharing A Planter's Observations …

1.0. Introduction

1.1. The writer has been involved in Ganoderma Control right from the beginning of his planting career back in 1966 in Johore using surgical method. He has covered Malaysia and Indonesia extensively as a Planting Advisor since 1985. In his work, he had come across some very severe Ganoderma infestations, even to the **first generation oil palm planting** in the peat soils in Indonesia. Low scattered incidences were also seen in the mineral soil of new jungle plantings under heavy manuring regimes. He had been monitoring/ observing several methods of Controlling Ganoderma since, namely:-

- **Surgical –Skilful job-** effective but very tedious and labour intensive **(Hands on experience)**
- **Cultural Practices –** mainly burning/ removing / isolating disease palms / inoculums**.**
- **Fungicide Spraying / Trunk injection –** Temporary relief ± 2 years before relapsing.
- **Trunk injection of certain acids / enzymes -** will relapse in 2 years if not timely followed up.
- **Fertilizers incorporated with microbes / enzymes / micro-nutrients-** latest in the market.
- **Planting Ganoderma disease "tolerant" materials –** in Indonesia **and**
- **Microbes–** Effective Microbes (EM) or in Spores Concoctions.

1.2. While breeding for a resistant / tolerant OP planting material will be the ultimate solution, it is still under trial. Pursuing further into **Soil Microbes** would be the **best way** as done by many Researchers now. Since Ganoderma is a microbe, it is only logical that microbes would provide a solution also. **Mother Nature** has its way of check and balance, like, **"it takes a thief to catch a thief".** There are many microbial concoctions in the market nowadays, majority in EM forms but not all are effective against Ganoderma. Most microbes are good as soil enhancers for various crops, provided they are being applied properly. The Microbial concoction used for this Ganoderma control exercises in **Spores form**, stored in **clear liquid** and with **no shelf life**. The EMs with short shelf life are unstable and some may even require **re-formulation** on site before being used, thus not application friendly. This natural method has been **improved progressively** with time.

1.3. It is agreed that to-date, there is no 100% effective "**cure"** for Ganoderma infestation. Unlike Rubber, Oil Palm does not have the "Cambium" layer, thus damages are unable to "heal" fully. Hence, for a **product** to be considered effective against Ganoderma, it has to be able to **halt the active aggression** of the disease inoculums within the infected region in the palm trunk/base. Products with only "**preventive ability**" are not good enough as **any**

normal healthy palm root would be able to fend for themselves against Ganoderma. The urgency in Ganoderma control lies in the **young /prime Oil Palms,** to prevent the decline in their FFB yield trend through losses in palm stands, which would invariably shorten their economic lifespan leading to earlier replanting. Worse still, if left untreated during the old stand stage, Ganoderma re-infestation would surface in the new replants early in their immature stage as seen in plantations in Johore, Malacca, Sumut, Riau& Kalbar. Therefore, it would be prudent to treat Ganoderma early so as to prevent the disease from spreading with time, which would be more difficult to overcome later.

2.0. Soil Microbes

2.1. Since Ganoderma spores / inoculums are present in the soils as a **norm** akin to Cancer cells in a human body. While diet (**especially sugar**) plays an important role in the manifestation of **Cancer** in the human body, there must be something that trigger the soil Ganoderma pathogen to manifest and infect the roots of Oil Palms. In this respect, could the **heavy application** of chemical fertilizers be a **pre-disposing cause?** Further, being a **Basidiomycete** with large hypae, Ganoderma's hypae may not be able to penetrate the normal cell walls of a healthy palm root by itself. It would need help from other soil micro-organisms or from prior-inflicted physical wounds. Therefore, Ganoderma could only be a secondary infector instead of primary. It is strongly believed that heavy chemical fertilizer applications adopted in pursuit of higher FFB yields, is one of the main causes for the spread of Ganoderma - both in terms of fertilizer type and standard of application. It has also been observed that Ganoderma cases usually start from the roadside (1-5 palms) initially before spreading further inwards.

2.2. Microbes are no miracle creatures, their response are slow and their efficacy of control against Ganoderma is variable according to the following:-

- **Rainfall /Weather conditions.**
- **Land Terrain / Soil types.**
- **Upkeep practices / ground vegetations;** and
- **Standard of application / treatment.**

2.3. To achieve optimal result from this natural method of Ganoderma control, one should have an open mind, be fully committed and adhere closely to the spraying protocol. Proper / even delivery of the Microbes Mixtures on the **soil surface** within the palm circles is vital since microbes spread only through **Binary** actions. More often than not, **failures in control** were due to spraying shortfalls – **uneven or skipped spraying**. Therefore, stringent supervision on the ground during spraying, is crucial.

3.0. Recovery Symptoms Observed

3.1. The most impressive recovery symptom seen after 2 years of treatment was, **healthy active palm roots growing within the treated diseased section(β)**. This would not have been possible if the active Ganoderma inoculums had not been successfully **neutralized.** The other positive symptoms observed during the treatment period were:-

- **Recovery of palm canopy –** Longer fronds / opened spears / broader pinnae.
- **Increase in new female inflorescences –** less bunch abortion.
- **Larger bunches –** better fruit sets.
- **Diminishing appearance of disease fruitifications–**will continue to appear until food source / reserve depletes fully.
- **Accelerated rotting of infected tissues –** depleting food source by microbes.
- **Disease aggression stopped gradually–** usually followed by saprophytic termites.
- **Increased in windfall casualties –** weakened anchorage of stage 3-4 cases after rotting.
- **Profuse rooting when mounded after >1 year's treatment -** microbes enhance rootings (β)**.**
- **Reduction in soil acidity from ±pH4.0 to pH5.5 -6.0** due to soil microbial reactions and
- **Underplanting, 2m from standing infected / dying palm -** not re-infested after 5 years (β)**.**

3.2. All the recovery symptoms shared above were from **Personal Observations** over a period of ±9 years (2009-2018) from Commercial Trials in small estates instead of Scientific Trials conducted by the Research fraternity. Therefore, the observations may not be deemed conclusive i.e. Conforming to Research's technical requirements. Admittedly, there would be many ambiguities and assumptions, which, it is hoped that some interested Research parties who may follow up in future, to **link up the missing dots.**

4.0. Commercial Trial Parameters Adopted

4.1. As a Planter, the parameters used for the commercial trials were more realistic and practical instead of technicalities, they were:-

- **FFB Yield sustenance –** comparable yield trend to "Control" fields.
- **Cost Effectiveness –** direct / indirect (logistic) savings.
- **Easy / Safe to apply**
- **Environment / MSPO / ISPO friendly.**

4.2. The main objective of this natural method is to stop the advancement of Ganoderma disease **promptly**, thereby arresting the decline in FFB yield trend caused by the losses in palm stand. Since replacement of usual **chemical fertilizer manuring** with **Bio Microbes manuring** is a pre-requisite during the **3 years treatment period only**, those who were to adopt this method of control would actually make more money via:-

- **Sustaining FFB yield trend instead of declining if untreated.**
- **Significant savings on high cost of chemical fertilizers** cheaper Bio Microbes concoction.
- **Direct / indirect savings -**logistics in handling / storage of the bulky chemical fertilizers&
- **Less workers required.**

4.3. The quantum of savings would depend on the estate's existing manuring regime and the extent to which the Ganoderma control is being carried out using this natural method.

5.0. Conclusion

5.1. Although researches into finding a more effective method in controlling Ganoderma infestation are still ongoing, it is felt that **Soil Microbes** provide good potential as seen, therefore, they warrant further follow up studies by interested parties concerned.

5.2. The main aim of this article is to share with those **Planters/ Stakeholders** affected economically by the deadly Ganoderma disease, that there is a **feasible /economical** control method using **correct natural Microbes**. Though this has not being proven scientifically, it has shown positive results under commercial observation trials, especially in arresting the **active disease aggression** inside the infected section. The other commercial benefit is- **realizing higher profits** through sustained FFB yield trend at lower input cost, which is **contrary to being an added cost** under normal disease treatment operation. This extra saving will come in very handy under present **depressed OP price and high fertilizer cost scenario**.

5.3. For those who are using other methods of Ganoderma Control presently, there would be no loss for them in trying out this method as a comparison on efficacy.

(β)

Bruas Perak:– Stage 3/4 infestation – new roots after 3 year's treatment.

Lahad Datu:- Stage 3/4 Ganoderma – **Profuse rooting** - Mounded in 2012. De-mounded in December 2015 for Replanting.

Laras, Sumatra Utara:- 2012 Underplanting, still not re-infested in 2017.

MEOA 34TH Annual Golf Tournament

The Datuk Boon Weng Siew Challenge Trophy

By Kenneth Jacobs & Siow Yuen Seng

Friday 27th July 2018

At Nilai Springs Golf & Country Club, Negri Sembilan

This year, we hosted our 34th Annual Golf Tournament at Nilai Springs GCC, where we were joined by members, friends & supporters of MEOA. The weather did not disappoint, as a light drizzle officiated our shotgun tee-off, cooling off the greens for an enjoyable round of golf for all 89 participants.

We congratulated our member Mr Jason Chee Kok Seng, for winning the Datuk Boon Weng Siew (DBWS) Challenge trophy for the first time & also sharp-shooting Guest Champion, En Mazlan Ahmad, for his Hole-in-One on hole 6.

DBWS Challenge Trophy Winner – Jason Chee

Guest Champion & *hole-in-one* winner, En Mazlan *(4th from left)*

Lastly, we would like to thank all our Flight sponsors for their generosity & support, and our Dinner sponsor for the wonderful meal that capped off a memorable day!

Golf Tournament – Acknowledgement

~ End ~

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