NEWSLETTER
Malaysian Society of Plant Physiology

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NEW YEAR MESSAGE *from* PRESIDENT

First of all, allow me to wish all of you a 'Blessed New Year'. 2011 is the start of the 10th Malaysian Plan which is based on high income nation, inclusiveness and sustainability. Economic growth will also be more targeted with efficient use of resources on sectors that Malaysia has the competitive advantage. Specific cities and urban clusters will be developed into vibrant, productive and liveable cities comparable to other major cities in the world.

Plant physiologists could contribute significantly to the above mentioned aspiration of government in the 10th Malaysian Plan. The role of plant physiologist is more important today especially in addressing these aspirations. It is our duty to bring hope to the communities depending on plants as their livelihood and to improve the quality of life of the urbanities. Your work in improving the yield, quality, conservation, etc. would help in maintaining our rich biological diversity and cultural heritage while achieving the sustainable use of resources.

Last year, we started our long-term ambition of building capacity programmes. We organized our two training courses with our collaborators, Elite Scientific and Labquip. In addition, the 21th MSPPC was organized successfully last year. We would like to express our gratitude to both our collaborators and all participants. We urge you to visit our website from time to time to get updates on our courses and conferences.

The work of the Society is done by a large group of volunteers. I am grateful for the willingness of the members of the executive and the various committees to make this a vital and vibrant society.

MSPP is a professional scientific body dedicated towards promoting Research and development in tropical plant biology

MSPPC 2010 .....

by

Phebe Ding

Malaysian Society of Plant Physiology (MSPP) had its 21th Malaysian Society of Plant Physiology Conference (MSPPC2010) on 13-14 December 2010 at Equatorial Hotel, Brinchang, Cameron Highlands. The conference was co-organized with Malaysian Agricultural Research and Development Institute (MARDI) with the theme "The Role of Plant Physiology in Climate Change Adaptation and Mitigation". The conference was officiated by the Director General of MARDI, Datuk Dr. Abd. Shukor Abd. Rahman.

In conjunction with the theme of the conference, the Director General of National Hydraulic Research Institute of Malaysia (NAHRIM), Ir. Hj. Ahmad Jamalluddin Shaaban, was invited to deliver the keynote paper. He introduced NAHRIM and alerted the participants on its involvement in climate related research, including the observation and projection of global and local climate change. He also presented the outcome of some of their studies. There is a National Water Resources Study for Peninsular Malaysia for 2000-2050 but the study does not include the relevant climate change aspects.

There were a total of 13 papers and 23 posters addressing the recent studies and findings on the effects of environmental changes on plant growth performance in this conference. Unpredicted changes in rainfall patterns and extreme weather crisis had caused big losses to agricultural sector and the plant scientists must play a vital role in ensuring sustainable crop production.

A post-conference tour was held in the afternoon on 14 December 2010. The participants visited MARDI Cameron Highlands. It is an Agrotechnology Park with showcases of crop production systems and a collection of living plants ranging from herbs to fruit trees. The participants enjoyed the trip under cool weather condition.

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MSPPC 2010 .....

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NOTES FROM MEMBER 1

LEMONGRASS (*Cymbpogon citratus*) PRODUCTION IN MALAYSIA

by:

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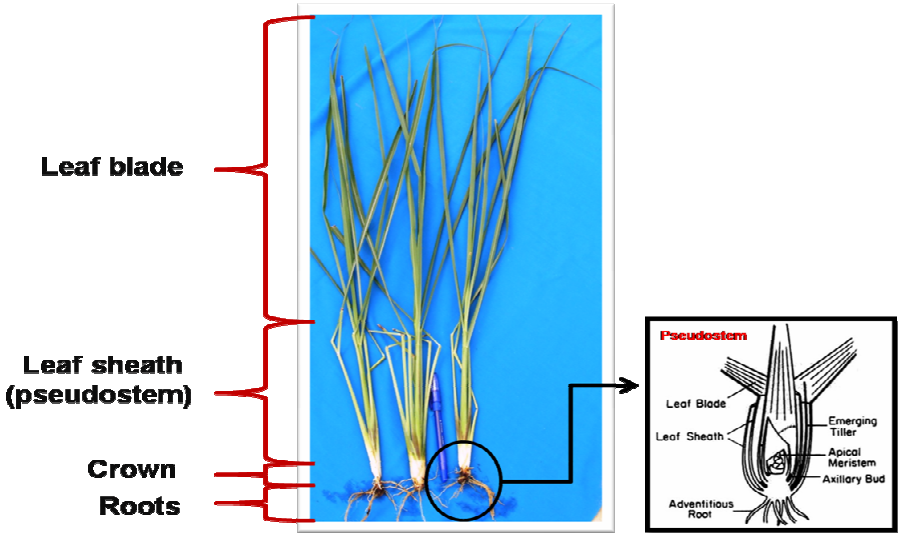
Lemongrass is an aromatic plant belonging to the Gramineae (Poaceae) family. It is a tall and clumped perennial grass growing to a height of 1m. The leaf-blade is linear, tapered at both ends and can grow to a length of 50 cm and width of 1.5 cm. The leaf-sheath is tubular in form and acts as a pseudostem. This plant produces flowers at matured stages of growth. Conversely, flowering has never been observed under cultivation due to early harvesting time. The rhizome produces new suckers that grow vertically as tillers to form dense clumps. Lemongrass can tolerate a wide range of soils and climatic conditions. However, luxuriant growth is obtained on well-drained sandy loam soil with high fertility and exposure to sunlight.



Lemongrass is normally propagated using vegetative planting materials consisting of basal leaf stalks of ±25 cm in length. The lemongrass stalks are planted at a spacing of about 1m x 1m, with 2-4 stalks being planted directly into the soil, by placing the basal part of the stalk within a depth of 2 cm. Watering is normally done in the first few weeks after planting, then on, the crop will have to depend on rain water. The lemongrass can be fertilized using a mixture of single fertilizers at the rate of 300 kg N/ha, 100 kg P_2O_5/ha and 100 kg K_2O/ha, applied at 1.5, 3 and 4.5 months after planting. The fertilizer is evenly spread around each cluster. Since manual weeding has to be carried out once a week, farmers opt to do chemical weeding every three-four weeks.

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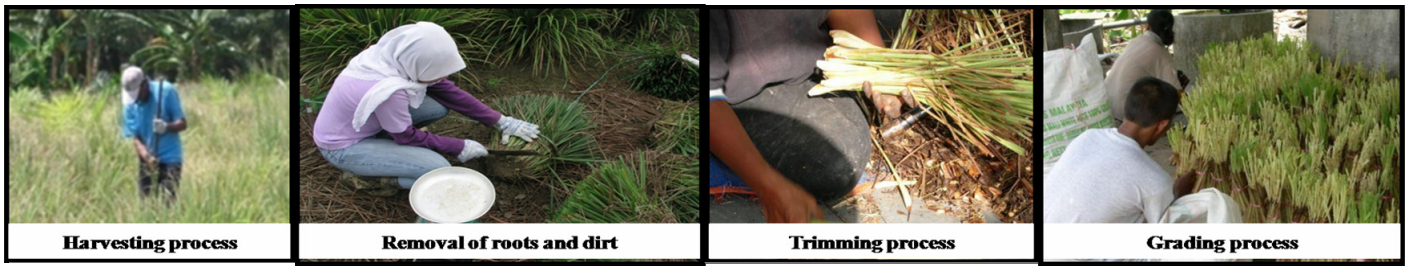
The lemongrass is harvested between 5.5 to 7.5 months after planting. Clusters of the lemongrass are harvested by digging them out of the soil together with their roots using a sharp hoe. Then, the roots were cut off and the remaining dirt on the stalk is cleaned off dried leaves. After the cleaning process, 3-4 lemongrass stalks are tied together with a rubber band, then they will be bundled up to a kilogram/bundle for sale. The whole lemongrass is harvested for stalk for culinary and leaf for essential oil production. Presently, production of fresh lemongrass in Malaysia is about RM 25 million/year which are with equivalent 12,500 tones/metric as reported from Department of Agriculture of Malaysia.



Harvesting process | Removal of roots and dirt | Trimming process | Grading process

The consumers usually prefer lemongrass with bigger stalk with strong citral aroma, no red pigmentation and clean stalk. However, lemongrass suffers from 'red pigmentation' on the pseudostem during postharvest handling due to exposure to direct light. Recently research found that lemongrass packed with plastic bag and stored at 10 ^{o}C show reduced the anthocyanin formation and prolonged the shelf life of lemongrass. Recent studies also indicated that maturity stage at harvest also had a significant impact on quality of lemongrass. Anthocyanin content was significantly higher when lemongrass was harvested at 7.5 months as compared to lemongrass harvested at 5.5 and 6.5 months.

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GRASS FAMILY....

This family of plants is known as Poaceae or Gramineae. It is a large and nearly ubiquitous family of flowering plants. Plant communities dominated by Poaceae are called grasslands; grasslands are estimated to comprise 20% of the vegetation cover of the Earth.

Grasses are important plant family to human economies: It includes the staple food grains and cereal crops grown around the world. Civilization was founded largely on the ability to domesticate cereal grass crops around the world. Grasses also include lawn and forage grasses for many grazing mammals, such as cattle and other livestock, deer, and elephants. Grasses are also used as food plants by many species of butterflies and moths. Bamboo is another useful grass. It is widely used for construction throughout East Asia and sub-Saharan Africa.

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Wisdom is not a product of schooling but of the life-long attempt to acquire it. - Albert Einstein

The value of a man resides in what he gives and not in what he is capable receiving. - Albert Einstein

The most damaging phrase in the language is, "It's always been done that way". - Admiral Grace Hopper

NOTES FROM MEMBER 2

GROWTH AND FLOWERING OF *Etlingera punicea*

by:

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Etlingera punicea is an earth ginger indigenous to Malaysia. It is locally known as "tuhau", "tubu nanung" and "tepus" (Poulsen, 2002). For ethnobotanical applications, young shoots of *E. punicea* are used as medicine for Beri-beri disease (Kulip, 1997). This species has striking flowers growing on ground level. The flower has a long yellow lip fringed with red on a subterranean inflorescence and contrasts sharply with the drab colours of forest floor debris. It secretes considerable amounts of nectar (Sakai *et al.,* 1999). However, there were not many documents about the botany and growth of *E. punicea*. The objective of this study was to record the growth performance and inflorescence development of the population of *E. punicea* at Sabah Agriculture Park, Tenom. These plants were among the small population of ginger species domesticated in this park for research, education and other related purposes. The data recorded can be basic sources of information for future research and provide a guideline on the horticultural introduction of this species.

Table 1. Vegetative growth performance of *E. punicea* plants

Site A (26 tillers aged 13 years old))					
Descriptive analysis	**Height of tillers (cm)**	**Diameter of tiller (cm)**	**Leaf number/ tiller**	**Leaf length (cm)**	**Leaf width (cm)**
Maximum	533	3.58	31	69.5	17.6
Minimum	51	1.26	2	28	8
Mean	278.5	2.400	15.8	47.46	13.81
Standard Deviation	132.71	0.627	8.65	11.326	2.587
Site B (35 tillers aged 7 years old))					
Descriptive analysis	**Height of tillers (cm)**	**Diameter of tiller (cm)**	**Leaf number/ tiller**	**Leaf length (cm)**	**Leaf width (cm)**
Maximum	450	2.84	29	74.7	17.3
Minimum	98	1.09	3	22	5.3
Mean	269.7	2.097	15.0	47.99	13.42
Standard Deviation	103.58	0.491	7.47	11.639	2.642

Table 2. Classification of height of tillers of *E. punicea* plants on last week of observation

Height Class (cm)	**Population size (%)**	
	Site A	**Site B**
50 to 150	19.23	22.86
151 to 250	26.92	22.86
251 to 350	19.23	34.29
351 to 450	26.92	20.00
451 to 550	7.69	0.00

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Table 3. Interval of inflorescence stages in days

Stage	1 to 2	2 to 3	3 to 4	4 to 5	Cycle duration
Maximum	9	1	2	1	13
Minimum	5	1	2	1	9
Mean	6.8	1	2	1	10.8
Standard Deviation	1.60	0	0	0	1.60

Note: Stage 1 = Inflorescence bud initiation, Stage 2 = Initial bloom of inflorescence, Stage 3 = Half bloom of inflorescence, Stage 4 = Fully bloom of inflorescence, Stage 5 = Senescence of the inflorescence

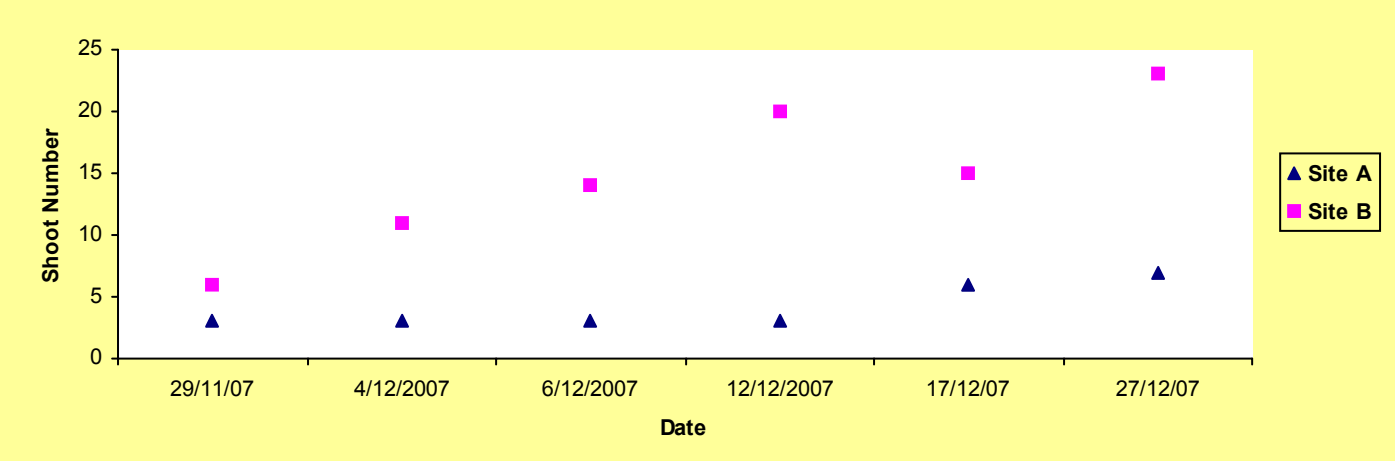

Figure 1. Number of new shoots

Table 4. Growth measurements of *E. punicea* inflorescence in cm

Descriptive analysis	Bud		Calyx		Labellum		Inflorescence D	No. of Fertile Bract	No. of Corolla
	L	D	L	D	L	D			
Maximum	6	3.49	8	7.35	5	1.18	10.32	8	8
Minimum	0.5	2.68	6.5	5.5	3.25	0.82	8.8	2	2
Mean	4.490	3.083	7.083	6.267	4.075	1.018	9.586	4.417	4.889
Standard Deviation	1.149	0.282	0.495	0.659	0.568	0.121	0.537	2.065	1.811

Note: Based on inflorescence that completed the growth cycle until senescence; L denotes length; D denotes diameter

Etlingera punicea plants at site A were generally more uniform in their vegetative growth in terms of diameter of tillers, height of tillers, leaf number and leaf size but not efficient in terms of new shoot and inflorescence production as compared to site B. It was probably due to the age of the stand. The lack of new shoot and inflorescence production at site A was also probably due to the bad condition of plants following damage by pests, in addition to the lack of proper husbandry practices. The big trees adjacent to the plants at site A were also competing with *E. punicea* plants for nutrients and other growth requirements.

Plants at site B were exposed to full sunlight, thus allowing them to produce more new shoots and inflorescences. This site was also damper as compared to site A which was rather dry throughout the observation period. The availability of moisture also probably contributed to the better growth of new shoots and inflorescences with this species. The growth performance and inflorescence characteristics of this species are yet to be explored further.

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Wonders of Plants …

God's Crown ???

The tropical rainforest is often rich in plethora of medical qualities. Mahkota Dewa is scientifically known as *Phaleria macrocarpa*. It means 'God's Crown'. The name given to this fruit implies that it descends from heaven, as a benediction from divinity to help mankind. It is a plant from the family of Thymelaeaceae.

Mahkota Dewa is an indigenous plant from the island of Papua (Irian Jaya). It is a dense evergreen tree, growing well in tropical climates.

The tree can grow with ease up to about nine meters in height in areas from 0 - 1000 meters above sea level. It is usually propagated by using seeds. After planting for about 18 months, it effortlessly produces ample fragrant flowers that eventually develop as young green fruits on every branch. In a maturing process, the fruits then become a dazzling red tone in shapes that range from a ping-pong ball to apple size in appearance. Some of the local residents reported that the tree is only decorative and its fruit is extremely poisonous. However, this fruit is currently being sourced by outsiders to heal many kinds of disease.

The entire component of the crop, seeds, fruit, leaves and branches all contain medicinal properties. It can be utilized as single drug or mixed with other herbs to strengthen its effects and to neutralize its poison. The immature green fruit as well as the ripened red fruit can be shredded and sun-dried. Take one tablespoon (no more) of this dried shredded flesh and mix it with a glass of boiling hot water to make a beverage infusion. It is believed that the flesh of the Mahkota Dewa fruit contains the anti-oxidant compounds that fight cancer. This is not recommended for pregnant women as consumption of this non-prescribed alternative medicine can endanger the unborn fetus.

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Have patience with all things, but first of all with yourself. - St. Francis de Sales

You can live to be a hundred if you give up all the things that make you want to live to be a hundred. – Woody Allen

Those instrumental goods which should serve to maintain the life and health of all human beings should be produced by the least possible labour of all. - Albert Einstein

Gossip is the art of saying nothing in a way that leaves practically nothing unsaid. - Walter Winchell

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