



BIOCHAR MALAYSIA ASSOCIATION

Reduce Carbon Footprint, Increase food productivity

Editor: Dr. Rosazlin Abdullah

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BMA AGM 3, PRE-AGM TALK AND PRE-AGM FIELD ACTIVITIES

The Third BMA AGM was held on May 16th, 2017 at Agriculture Hall, Faculty of Agriculture, UPM. The sunny Tuesday started with a Pre-AGM field activity. The 80 participants walked to the Organic Unit, Faculty of Agriculture, UPM to watch the hands-on biochar production at field scale from Dr. Amran (UPM) and Dr. Rosazlin (UM). It was later followed by hands-on biochar application at the BMA Demo plot, Organic Unit, Faculty of Agriculture, UPM lead by Prof. Dr. Rosenani (UPM) and Dr. Siti Hajar (UPM). All participants experienced applying biochar and corn planting during that field trial. Upon completion, heavy breakfast was served during the break, before all participants and BMA's members gathered back at Agriculture Hall, Faculty of Agriculture for a seminar. The Pre-AGM talk with the theme 'Biochar: Progress, Challenges and Moving Forward' was successfully delivered by Dr. Nahrul Hayawin from MPOB. Her talk was inspirational and has attracted the attention of many parties including industry, farmers, researchers, students as well as the general public. The annual general meeting started right after the conclusion of the Pre-AGM talk and 43 BMA members listening to the BMA AGM report by the committee members. Interactions, discussions and suggestions were fruitful and highly appreciated by BMA in moving forward regarding biochar production, application, research, collaboration and technology transfer to the community. - Dr. Noraini Md Jaafar



Biochar Malaysia Association (BMA) marks its fourth year anniversary since its establishment. The successful branding and rapid growth of our association locally and internationally have been greatly contributed by various brainstorming sessions and activities carried out by our members from great range of universities and government agencies such as UPM, UM, FRIM, MPOB, MARDI including collaborations with others within the industries.

At the Pre-AGM Talk, a seminar entitled 'Biochar: Progress, Challenges And Moving Forward' was given on the 16th May 2017 in Agriculture Hall, Faculty of Agriculture, UPM as the first of many activities planned for the 2017/2018 session. The seminar given by Dr. Nahrul Hayawin from MPOB has successfully attracted people of all walks of life including from the industries, farmers, researchers, students and also the general public. The field activity, application of biochar and the impacts on organic plantation involving the planting of corns at Demo plot BMA, Organic Unit of Faculty of Agriculture, UPM during BMA AGM 2017 also gathered good attention from the public. The results of the research carried out on the demo plot was written and reported in the newsletter and website for the attention of our members.

This is followed by many other activities such as a visit comprising committee members and BMA members (Dr.Amran, Prof.Zainab, Dr.Noraini, Pn.Theeba dan Cik Zahidah) to Indonesia in conjunction of their participation in ORGATROP in September 2017 (Jogjakarta) to present their research findings on biochar to the international audience. During our stay there, we took the opportunity to organize a gathering and technical discussion session with the committee members of Biochar Association of Indonesia (ABI). This gathering was made possible due to our constant communication via email prior visit and the recognition of BMA as a credible biochar association in the region and also international. In our discussion session, we have presented the idea of working together with the members of ABI in hosting and organizing the Regional Biochar Conference in 2018/2019.

BMA continued its effort in organising activities by using the platform in Dialog Programme by TN50 to showcase the aspiration and efforts of BMA in developing research and usage of biochar in Malaysia. Besides that, BMA managed to channel the inspiration and knowledge with the closely associated party, GreenTech Corporation under KeTTHA. Furthermore, BMA was active in successfully requesting financial grants such as Community Grant and KTP Grant (UPM-MARDI) to aid the activities organised by BMA and researches on the applications of biochar as an effort to further fortify and improve the research and community linkage with the industry.

As the finale activity of BMA for the session 2017/2018, a site visit to Biomass Technology Unit, MPOB was held on the 28th March 2017. We gathered 20 members to visit and experience the research conducted in MPOB on the production of biochar and the residue products such as wood vinegar. The publication of BMA newsletter 2017 consist of the various useful activities of BMA in the year 2017 and the research developments, educating the community on biochar in Malaysia.

I am very thankful and emotionally moved on the efforts and support from all members and committee members and I hope BMA will move forward holding the aspirations in developing biochar (production, usefulness and biochar research in Malaysia) for the betterment of the society. I would like to this opportunity to extend my invitation to the members for their inputs and suggestions in planning future activities and in the direction of BMA in achieving the objectives of this association while giving back to the society.



BMA TRIAL PLOT

The BMA Biochar Trial Plot was established on 10th May 2018, in conjunction with BMA AGM 2017. Corn was selected as the planting crop, and was planted on 3 different treatments as shown below;

Plot	Treatment	3 rd Cycle (12 th Dec 2017)	4 th Cycle (3 th May 2018)
1	Control (organic fertilizer)	52 cobs (7.9 kg)	60 (13.62 kg)
2	Organic fertilizer + husk biochar	73 cobs (15.27 kg)	63 (27.28 kg)
3	Biorichar	30 cobs (4.1 kg)	61 (21.26 kg)

Results obtained shows that corn grown on soil fertilized with a mixture of organic fertilizers and husk biochar (Plot 2) have higher yield, followed by plot 3 and 1. Differences between the crop yield in the 3rd cycle and 4th cycle, might be due to the amount of water received by the crops.

Dr. Daljit Singh



Figure 1: Left is control, Organic fertilizer (OF) only. Right is OF+ biochar put at start of trial



Figure 2: Organic fertilizer mixed with biochar.



Figure 3: Left =OF + biochar ; right= biorichar alone

Technical Discussion and Potential Collaboration between Biochar Malaysia Association (BMA) and Association of Biochar Indonesia (ABI)

A technical meeting between BMA and ABI was held in Universitas Gadjah Mada, Yogyakarta Indonesia in conjunction with BMA member's participation in ORGATROP 2017- International Conference on Organic Agriculture in Tropics on 22 August 2017. The members BMA members participated in the meeting were Dr. Mohd Amran Mohd Salleh (President), Dr. Noraini Md Jaafar (Secretary) Ms. Theeba Manickam (Treasurer), Ms Zahidah Abd Razak and Dr. Zainab Hamzah (members). Meeting participation from ABI were the president Dr. Ir Sukartono, Dr. Ir Widowati (Secretary) and Prof Dedy Nursyamsi (member). The main objective of the BMA-ABI meeting was to exchange ideas on biochar activities and the ways forward in biochar initiatives by the associations through potential collaboration. President of BMA has presented the overview of BMA activities and way forward of BMA for biochar industry in the country and followed by ABI on their objectives and current activities carried out in Indonesia. The Biochar Association of Indonesia (ABI) has been declared in Balikpapan on December 11, 2012. The establishment of the ABI was on the initiative of Prof. Dr. Ir. Wani Hadi Utomo and the formation of association was conducted at the Faculty of Agriculture, University of Tribhuwana Tungadewi, Malang. This non-profit association focuses on its activities on the application of biochar on improving food security and stability as well as biochar as a soil amendment. ABI has invited members of BMA to visit Indonesian research and development institutes and agriculture agencies engaged with biochar works such as ISRI, University of Thribhuwana Tungadewi and Institute of Agriculture, Bogor to acquire more ideas on the research and application of biochar in Indonesia. Technical visits, meetings and co-organizing workshops or conferences were discussed as the potential collaborative activities between BMA-ABI. Members of BMA welcomed ABI team to visit our biochar production and agencies engaged in biochar works in Malaysia. Detailed meeting will also be arranged during their visit here to discuss on biochar technical programmes or events in the future.

- Theeba Manickam



BMA visit to Biomass Technology Unit, MPOB-UKM

Kajang, Selangor – Biochar Association Malaysia (BMA) organized a visit to Biochar Plant at Biomass Technology Unit, Stesen Penyelidikan Usahama MPOB-UKM, Kajang Selangor on 28th March 2018. The half day visit were joined by about 15 participants from UM, UPM, FRIM and Pakar Malaysia. Mr. Hafiz, assistance research office at the Biomass Technology Unit share some insight on the technique use by MPOB to process biochar using environmental friendly technique. Besides that, MPOB also producing biochar using empty fruit bunch (EFB) for research use and marketing purposes. For those who interested to know more about the process of biochar and also product, kindly contact Dr. Nahrul Hayawin, nahrul.hayawin@mpob.gov.my .

Dr. Daljit Singh



Mr. Hafiz shows how to operate the microwave carbonizer

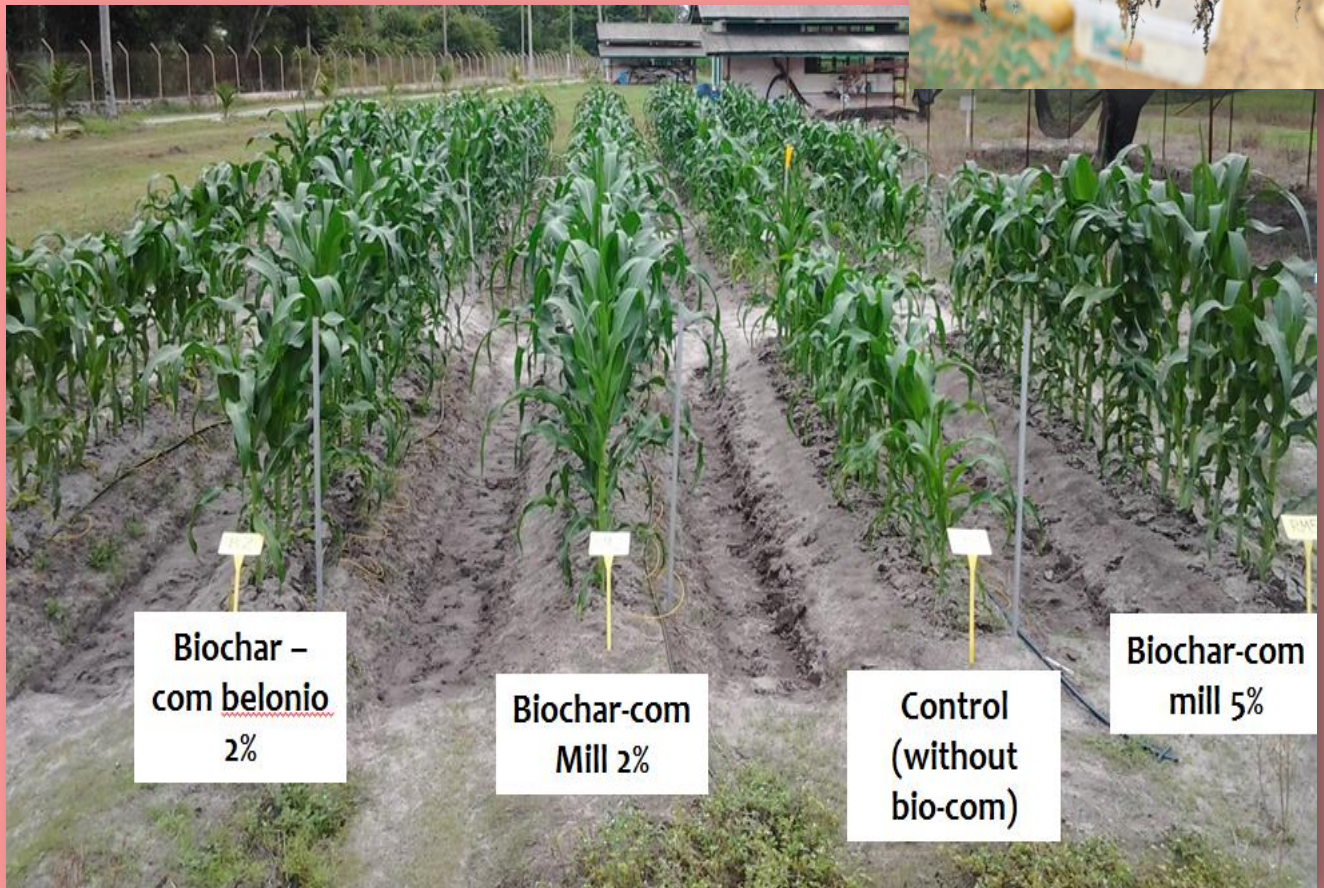
BRIS~FIXER:

Biochar~compost for Sustainable Sandy Soil Management

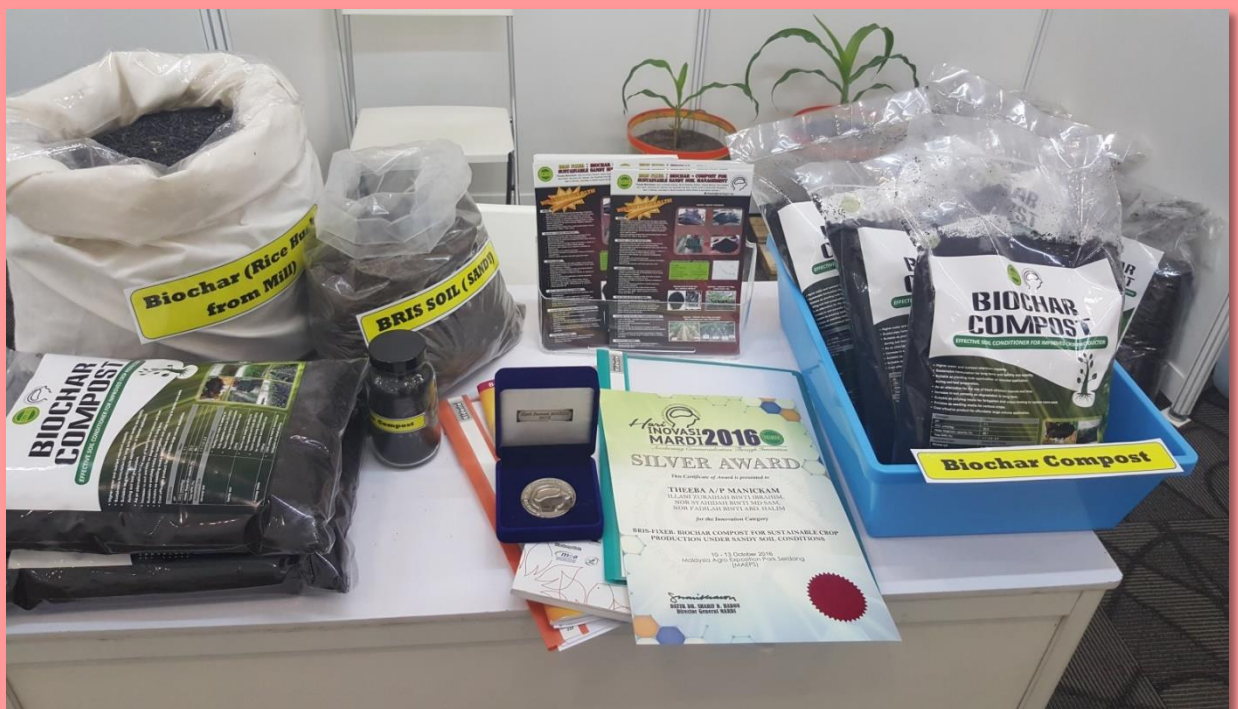
BRIS-FIXER is specially formulated through a co-composting process of biochar waste from rice processing mill and agriculture biomass. It is a green technology developed by Fertilizer Technology programme in MARDI for sandy soil management using waste from local rice processing mill. The application of BRIS-FIXER improves sandy soil properties such as pH and water & nutrient holding capacity through its high acid neutralizing capacity as well as the occurrence of meso and micropores. The continuous application of BRIS-FIXER has the potential to reduce the usage of chemical NPK compound fertilizer in long term through the improvement of organic matter and cation exchange capacity of sandy soil. BRIS-FIXER was tested on maize and cabbage crop under sandy soil in Bachok, Kelantan with yield increment 10-15% and soil water holding capacity >20% as compared to current practice using chicken manure. This green technology is very cost effective and able to solve the major waste management problem in rice processing mill by conversion into soil ameliorant material which suits well for problematic sandy soil nearby. - *Theeba Manickam*



BRIS-FIXER



Field Trial



Silver Medal in MSTE 2016

BIOCHAR PILOT PLANT: Fac. of Engineering, UPM



BIOCHAR FOR YOUTHS

Biochar, a stable solid, rich in carbon is gaining importance amongst the researchers due to its potential to sequester the carbon. The knowledge on the potential of this soil amendment as a climate change mitigation tool should be extended to the community especially the young generation in Malaysia. Therefore, to meet and transfer the knowledge, the Science, Technology, Engineering and Mathematics Fair (STEM) 2017 is the best platform for the Faculty of Plantation and Agrotechnology (FPA), UiTM to boost school students' interest in STEM subjects related to agriculture field. The one-day fair organized by Majlis Profesor UTeM in collaboration with Melaka State Education Department was held at Universiti Teknikal Malaysia Melaka on 20 September 2017. The participants consist of primary and secondary students from around 30 schools in Malacca that participated in this fair. During the exhibition, students were given a chance to get their hands smudged when handling the biochar samples at the FPA exhibition booth. They were excited to get a hands on experience and share their thoughts on this carbonaceous product. Then, En. Syed Ahmad Ibrahim Al Kired Syed Hasan demonstrated on how biochar was produced using Modification of Biochar Burner (MBB), an innovative product from his final year degree project to the students. The MBB project was funded by Internal Research Acculturation Grant Scheme (iRAGS), UiTM to innovate a biochar burner that produces a good quality biochar under economical cost. The benefits and application of biochars were then explained by Puan Norazlina Abu Sari with the assistance of En. Muhammad Lukman Alwi. This exposure creates anticipation for students to produce their own biochar by using available resources around them and at the same time opened their eyes on the importance of biochar in sequestering carbon. Aside from that, there were numerous STEM activities that were designed to nurture interest and competence such as Robotic Lego Competition, Maths is Fun, Celik STEM and Science and Technology Exhibition and talk. The exhibition gave opportunities for students to learn STEM in interactive way and re-apply information provided into real-world situations.

- *Norazlina Abu Sari and Nurul Raihan Abd Rashid*



Modification of Biochar Burner from Faculty of Plantation and Agrotechnology (FPA), UiTM, Jasin, Melaka



A brief introduction and demonstration to the students on how the MBB works

Biochar as Source of Income

Since UM-Biochar workshop in October 2016 being held, biochar knowledge sharing session and demonstration being actively conducted to community. On 16 November 2017, a half-day biochar workshop have been held at Agensi Antidadah Kebangsaan (AADK), Klang. This program was organised by Mdm. Mahanom Jalil from Plant Biotechnology Incubator Unit (PBIU) University of Malaya collaborated with UMCares and Granatech Sdn Bhd. Biochar team lead by Dr Rosazlin Abdullah from University of Malaya was being invited as speaker and demonstrator in *Penjanaan Ekonomi Melalui Pertanian Bandar*. This workshop was participated by former/current drug addict and under rehabilitation process. The aim of this program is to help the participants to improve their lifestyles and generate their own source of income in future from urban farming. The workshop was started with introduction of soils, role and management of soils and basic knowledge of biochar that include production, application and benefits of biochar. Besides knowledge transfer session, some activities was included in this program such as soil texture determination, soil pH reading and soil colour identification and biochar process demonstration by using biochar kiln. After the demonstration finished, the participants received a certificate of participant in this workshop. From the feedback, most of the participant understand the information on biochar which is new to them. Furthermore, some of the participant were very excited and give a positive responses and willing to try to produce biochar as source of income. - Nur Sa'adah Abdul Halim



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KHAMIS, 15 Februari 2018 BIL 420 BH

VARSITI

BERITA

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inovasi



Penyediaan Biochar bersama-sama
penduduk Kampung Seri Cheeding, Banting,
Selangor.



Aktiviti menuai bersama-sama
penduduk kampung.



Contoh bioarang yang dihasilkan
daripada sisa buangan organik.

Inovasi Biochar tangani sisa pertanian

Oleh **Meor Ahmad Nasriin Rizal Ishak**
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Kuala Lumpur

Pertanian adalah sektor utama di negara ini dalam menghasilkan makanan yang dapat menjamin bekalan secara berterusan. Di samping penghasilan produk makanan, sektor pertanian turut menghasilkan sisa yang perlu diuruskan secara baik.

Pelbagai pendekatan diamal untuk mengitar semula sisa pertanian antaranya penghasilan perabut daripada batang kelapa sawit dan juga kompos, namun langkah itu hanya dilaksanakan oleh

pihak industri yang menjalankan pertanian secara besar-besaran.

Berbeza dengan petani dan peladang secara kecil-kecilan, sisa pertanian selalunya akan dibuang atau dikumpulkan di satu tempat sama ada akan dibiarkan lupus ataupun dibakar.

Secara tidak sedar, proses penguraian dan pembakaran sisa pertanian ini akan menghasilkan gas rumah hijau yang menjadi sumber utama pemanasan global.

Urus sisa pertanian

Bagi mengatasi masalah itu, penyelidik dari Institut Sains Biologi, Universiti Malaya (UM), Dr Rosazlin Abdullah bersama sekumpulan pensyarah dan pelajar memper

kenalkan teknologi penghasilan Biochar.

Dr Rosazlin berkata, Biochar adalah produk yang diperbuat daripada biojisim seperti sisa pertanian, penterakan dan perhutanan melalui proses pirolisis iaitu sisa berkenaan akan dibakar di dalam keadaan oksigen yang terhad.

Beliau berkata, tempoh penyediaan Biochar adalah bergantung kepada jenis sisa pertanian yang digunakan.

"Teknologi penghasilan Biochar diketengahkan sebagai satu penyelesaian masalah pengurusan sisa pertanian kepada komuniti.

"Selain menggalakkan aktiviti kitar semula, Biochar juga berfungsi sebagai penambahbaikan kualiti tanah," katanya.

info

→ Projek Biochar dijalankan melalui program Jalinan Masyarakat UMCares dengan kerjasama Jawatankuasa Kemajuan dan Keselamatan Kampung (UKK) Kampung Seri Cheeding, Banting

Beliau berkata, bagi mencapai objektif projek ini, beberapa program sudah dijalankan antaranya bengkel pengenalan, demonstrasi, penghasilan dan pengaplikasian biochar terhadap tanaman sawi hijau bersama komuniti.

Mudah dikendali

Katanya, bengkel Biochar yang diadakan itu disertai lebih 150 peserta membabitkan penduduk kampung, pelajar Sekolah Kebangsaan (SK) Seri Cheeding, Sekolah Menengah Kebangsaan (SMK) Jenjarom dan Sekolah Menengah (SM) Sains Banting.

Teknologi yang diperkenalkan menggunakan alat yang mudah dikendalikan dan selamat iaitu tong besi yang diubahsuai daripada

tong dram terpakai dengan rekaan yang bersesuaian dengan konsep penghasilan Biochar.

Sementara itu, Pengarah UMCares, Prof Dr Norzulaani Khalid, berkata projek itu adalah sebahagian daripada usaha pihak UMCares untuk memastikan pensyarah UM berkongsi teknologi dan kepakaran dengan masyarakat.

"Saya yakin usaha murni penyelidik UM bersama komuniti Kampung Seri Cheeding, Banting dalam memperkenalkan aplikasi teknologi Biochar dapat meningkatkan lagi kesedaran serta tanggungjawab untuk melestarikan alam sekitar melalui amalan kitar semula sisa tanaman," katanya.

Biochar: Banana Festival 2018 at Bukit Selambar, Kedah

Nowadays, biochar have been introduced to community actively. On 16 April 2018, UM Biochar team lead by Dr Rosazlin Abdullah from University of Malaya again being invited as speaker in *Program Perladangan Pisang Pembangunan Ekonomi Golongan Sasaran* at Sungai Petani, Kedah. This program was organised by Prof Dr. Norzulaani from UMCares, University of Malaya collaborated with Neo Pragmatik Sdn Bhd. The aim of this program is to help and pull together with community to increase the production and income of small banana farmer by intercropping practising and introducing the latest technology in planting banana, management of farm and plant varieties. The program was participate by community from Kg. Sungkup and nearby, small farmers, students of Kolej Pertanian Malaysia and young entrepreneurs. With the trademark of #Janabanana, the program was filled by knowledge transfer session by biosecurity department from Department of Agriculture (DOA) Kedah on pest and disease control and Prof. Dr Zulaani Khalid on plant tissue culture before the inauguration of the opening ceremony by Dato' Tajul Urus bin Hj Mat Zain. Besides knowledge transfer session, some activities was included in this program including exhibition form department of fertility DOA, Mardi, biochar UM and demonstration on preparation of plant booster and effective microorganism (EM) by DOA and biochar from UM. In biochar demonstration session, besides demonstrate the process of producing biochar steps, we also explains the benefits and the potential of converting agricultural waste such as banana waste to the production of Biochar that can be applied again in intercropping practices. From the feedback, most of the participant get the idea and the information on biochar which never been heard before. Besides that, most of the farmers shows a positive responses and willing to try to produce and apply biochar in their farms to increase the yield and production of banana plant

- Nur Sa'adah Abdul Halim





Biochar Research in Faculty of Agriculture, UPM

Biochar as sorbent to immobilize arsenic in soil naturally enriched with arsenic

Soil solution study of incubated arsenic-rich Histosol amended with biochar was conducted to evaluate the effects of oil palm empty fruit bunch (EFB) and rice husk (RH) biochars on water soluble As naturally present in a Histosol (Sari et al., 2014). Empty fruit bunch and RH biochars exhibited important features as adsorbent with the porous structure (mesopores which allows solute to be transported in the biochar) and alkaline properties. The sorption experiment has shown the potential of these biochars to immobilize As in the soil system.

Biochar –compost mixture as growth media

The soils in tropical region, in general, are acidic and have low organic matter content. Therefore, incorporation of biochar with the compost as growth media can help improve the situation. Biochar-compost amendment improved the chemical properties of polybag media (pH, total C and N, C:N ratio, CEC, Mg and Ca). Root growth and shoot:root ratio significantly improved with 1.5% w/w C addition and 30% (v/v) compost with 75% recommended fertilizer rates applied (Rovica et al., 2018).

Biochar for retention of nutrients

Utilization of biochar has a strong potential to improve N fertiliser use efficiency in agriculture. An experiment was conducted in a mini-lysimeter system growing maize as test plant (Sherwin et al., 2017). The N source used was $(^{15}\text{NH}_4)_2\text{SO}_4$ at 80 kg N ha^{-1} (2 at% ^{15}N excess) and oil palm empty fruit bunch biochar (EFBB) was added at 0, 5, 10 and 20 Mg ha^{-1} . Application of EFBB significantly reduced cumulative leachate volume and mineral N leaching. Soils applied with EFBB significantly improved ^{15}N fertiliser recovery in maize and dry matter weight. Thus, EFBB has the potential to be applied on highly weathered acidic soil as an amendment to improve fertiliser efficiency for crop growth.

On-going studies

- 1) Blending chicken manure and rice husk biochar as organic fertilizer for safe application on land – Utilization of biochar during composting of poultry manure can help control N loss due to ammonia emission during the composting process.
- 2) Utilization of biochar for remediation of soils contaminated with heavy metals. The heavy metals investigated are Cd and Pb.
- 3) Utilization of biochar as carrier of phosphate fertiliser. Biochar can act as P sorbent and thus organo-P fertilizer can be developed.

50 RESEARCH PUBLICATIONS IN MALAYSIA

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☐ Apply as a new member ☐ Renew my membership (year) ☐ Change/update my address/details

Type of membership

I would like to apply to be a member of BMA

- ☐ Ordinary
☐ Associate (Non-Malaysian)
☐ Student (with proof)

☐ I agree to abide by the Rules and Regulations of BMA should my application for membership be approved

Registration fee

Entrance fee : RM 10

Yearly fee:

RM 50 /yr - Ordinary Member
RM 50 /yr - Associate Member
RM 10 /yr - Student Member

RM 300 -Life Member (after 3 consecutive years of being BMA member)

Mode of payment

- ☐ Cash
☐ Online Transfer

BANK : CIMB

Account Name: Persatuan Biochar Malaysia
Bank Account No: 8602078887

Name:

Title :

MyKad No:

Institution:

Address (home):

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Professional Position :

Field of Specialisation/Interest:

Background (Please tick where relevant);

- ☐ Professional
☐ Private/Government agency
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*** Online transfer – Please include member's name as reference and indicate biocharmalaysia@gmail.com at section 3rd party email address (MAYBANK) / Notify Receptent (CIMB)

I certify the particulars given are true and correct

FOR OFFICIAL USE

Date Received: Date Approved:

Receipt No :

Membership No:

Secretary Signature :



Biochar Malaysia Association

8.30 PAGI – 1.00 TGHARI

14 MEI 2018

BERTEMPAT DI
FAKULTI
KEJURUTERAAN,
UNIVERSITI
PUTRA MALAYSIA

BENGKEL TEKNOLOGI BIOCHAR 2018

Bersempena

MESYUARAT AGUNG
PERSATUAN BIOCHAR MALAYSIA
KALI KEEMPAT



AKTIVITI 1

PENGHASILAN BIOCHAR

Pakar dari insititusi awam dan pengilang biochar komersil berkongsi pengalaman dan ilmu.



AKTIVITI 2

LAWATAN KE LOJI PERINTIS BIOCHAR

Melawat loji rintis penghasilan biochar dan melihat sendiri proses penghasilan biochar.



AKTIVITI 3

INTERAKSI PENGELUAR-PENGGUNA BIOCHAR

Platform bagi pengeluar dan pengusaha biochar mempromosi biochar kepada petani, pengguna dan penyelidik.

YURAN PENYERTAAN

AHLI BMA : RM 50
BUKAN AHLI : RM 70
PELAJAR : RM 20



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