

# PROGRAM & PROCEEDINGS



## THE 2<sup>nd</sup> BIOCHAR MALAYSIA ASSOCIATION INTERNATIONAL CONFERENCE 2024

### **BMAIC 2024**

*& 10th BMA Annual General Meeting 2024*

**13-14** AUGUST  
2024



AUDITORIUM RASHDAN BABA  
UNIVERSITI PUTRA MALAYSIA

**"EXPLORING SUSTAINABLE SOLUTIONS FOR AGRICULTURE & ENVIRONMENT"**

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*Jiwa Merdeka*



## **TABLE OF CONTENTS**

Message from the Minister	<b>2</b>
Message from the President of Biochar Association Malaysia	<b>3</b>
Message from the Chairman of BMAIC 2024	<b>4</b>
BMA Management Committee 2022-2024	<b>5</b>
BMAIC 2024 Organizing Committee	<b>6</b>
BMAIC 2024 Scientific Programme	<b>7</b>
Extended Abstracts	<b>16</b>
Sponsors	<b>115</b>
List of Participants	<b>120</b>
Acknowledgements	<b>123</b>

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## BMAIC 2024 SCIENTIFIC PROGRAMME

<b>TUESDAY</b>	<b>13 AUGUST 2024</b>
0745 – 0850	Registration
	<b>OPENING CEREMONY</b>
0830 – 0900	Arrival of Guest of Honor
0900 – 0910	Singing of the National Anthem “Negaraku”, and Doa Recitation
0910 – 0920	Welcoming Remark by the Chairman BMAIC 2024 <b>Dr. Daljit Singh Karam Singh</b>
0920 – 0940	Opening Address by the Guest of Honor <b>YB Tuan Chang Lih Kang</b> Minister of Science, Technology and Innovation
0940 – 1000	Launching of BMAIC 2024
1000 – 1030	<b>PHOTO SESSION, BOOTH EXHIBITION, &amp; COFFEE BREAK</b>

1030– 1115	<b>KEYNOTE ADDRESS</b> “The Multifaced Role of Biochar for Agriculture and Environment” <b>PROF. DR. NANTHI S. BOLAN</b> <i>University of Western Australia, Australia</i> <i>Chairperson: Prof. Datin Dr. Rosenani Abu Bakar</i>
	<b>SESSION 1: SOIL HEALTH AND CONSERVATION</b> <i>Chairperson: Assoc. Prof. ChM. Dr. Yong Soon Kong</i>
1115 – 1145	<b>Plenary 1</b> “Biochar, the Black Gold: Momentum, Challenges and Future Prospect to Enhance Soil Health” <b>PROF. DR. IR. BENITO HERU PURWANTO</b> <i>Universitas Gadjah Mada, Indonesia</i>

1145 – 1200	<p><b>Biochar-Induced Changes on Soil Nutrient Retention and Hydraulic Characteristic of Sandy Loam Soil in Zambales, Philippines</b></p> <p><i>Jacob B. Labita, Angelita C. Marcia, Frances P. Villa Juan, John Loyd M. Pagaduan, Edna D. Samar &amp; Karen S. Bautista</i></p> <p><i>Bureau of Soils and Water Management, Quezon City</i></p>
1200 –1215	<p><b>Evaluation of Biochar Behaviors in Soil</b></p> <p><i>Inubushi, K., Matsubara, R., Sahara, I., Ohshima, H., Kato, T., Narisawa, M., Ebe, F. &amp; Kasai, H.</i></p> <p><i>Tokyo University of Agriculture</i></p>
1215 – 1230	<p><b>Chicken Litter Biochar Minimized Acidity of Bekenu Series Soil</b></p> <p><i>Visvini, Lohanathan., Omar, Latifah. &amp; Osumanu, Haruna Ahmed.</i></p> <p><i>Universiti Putra Malaysia, Bintulu Sarawak</i></p>
1230 – 1430	<p><b>EXHIBITION &amp; LUNCH</b></p> <p>10<sup>th</sup> BMA Annual General Meeting</p>
	<p><b>SESSION 2: BIOCHAR PRODUCTION AND APPLICATION</b></p> <p><i>Chairperson: Mr. Gary Dass Anthony Francis</i></p>
1430 - 1500	<p><b>Plenary 2</b></p> <p>“The Evolutionary Journey of Biochar Production”</p> <p><b>PROF. DR. ROBERT THOMAS BACHMANN</b></p> <p><i>Universiti Kuala Lumpur, Malaysia</i></p>
1500 – 1515	<p><b>Not All Biochar is the Same</b></p> <p><i>Lai Yeng Fock</i></p> <p><i>Carbon Zero</i></p>
1515 – 1530	<p><b>Comparative Evaluation of Valorization of Eucalyptus Bark and Palm Empty Fruit Bunch (EFB) Conversion to Biochar for Sustainability in Totality</b></p> <p><i>Subhash Maheshwari, Siswanto ID &amp; Rupam Kataki</i></p> <p><i>PT Tanjungenim Lestari Pulp and Paper Company, Indonesia</i></p>

1530 –1545	<p><b>Utilization of Solid Carbon as a Mixture of Biochar to Improve Pyrolysis Yield</b></p> <p><u>Young Ho Seo &amp; Pil Joo Kim</u> Gyeongsang National University, South Korea</p>
1545 – 1600	<p><b>A Green Alternative: Hydrothermal Carbonization (Wet Pyrolysis) at Different Reaction Times in Producing Activated Hydrochar from Sugarcane Bagasse with the Ability to Remove Crystal Violet Dye</b></p> <p><u>Farahin Mohd Jais &amp; Syamim Syarah Farhah Sazali</u> Universiti Malaya</p>
1600 – 1615	<p><b>Synthesis and Characterization of Rice Husk Derived Activated Carbon Via Microwave Assisted H<sub>3</sub>PO<sub>4</sub> Activation</b></p> <p><u>Ali, Muhamad Danial, Yong, Soon Kong. &amp; Muna, Nailly Asna.</u> Universiti Teknologi MARA, Shah Alam</p>
1615 – 1630	<p><b>Empowering Citizen Scientists to Improve Plant Productivity with River Waste Biochar Application</b></p> <p><u>Jeyanny V, Rosazlin A, Nur Sa'adah AH, Masbudi M, Ali TKZ, Mohammad Zamir AR, Lai YF &amp; Darshini R</u> Forest Research Institute Malaysia (FRIM)</p>
1630 – 1645	<p><b>Biotron: Innovation on Biochar for Sustainable Development</b></p> <p><u>Dedi Nursyamsi.</u> Ministry of Agriculture, Republic of Indonesia</p>
1645	<b>REFRESHMENT</b>

<b>WEDNESDAY</b>	<b>14 AUGUST 2024</b>
	<b>SESSION 3: SUSTAINABLE AGRICULTURE</b> <i>Chairperson: Dr Zulkifli Haji Shamsuddin</i>
0845 – 0915	<b>Plenary 3</b> “Unlocking the Novel Trends of Biochar Composites” <b>ASSOC. PROF. DR. ROSAZLIN ABDULLAH</b> <i>Universiti Malaya, Malaysia</i>
0915 – 0930	<b>Complementary Effect of Biochar and Gibberellic Acid (GA3) in Paddy – A Potential Approach for Sustainable Grain Yield Increase and Grain Quality</b> <i>Iffah Haifaa Mat Deris, Moses Christopher, Mohamad Roff Mohd Noor, Wei Qi Mong &amp; Mohamad Adlan</i> <i>Valent Biosciences, Libertyville, IL USA</i>
0930 – 0945	<b>Enhancing Growth Performance and Yield Attributes of <i>Capsicum Chinense</i> Through Pineapple Leaf Biochar Enriched with <i>Trichoderma</i> Biofertilizer</b> <i>Mahdian, Suraiya., Mohidin, Hasmah., Khalid, Khadijah. &amp; Abdullah, Rosazlin</i> <i>Universiti Teknologi MARA, Cawangan Sarawak, Kota Samarahan</i>
0945 – 1000	<b>The Potential of Vetiver Grass Biochar Mixed with NPK Fertilizer on Oil Palm (<i>Elaeis guineensis</i> Jacq.) under the Nursery Condition</b> <i>Idris, Juferi., Aleiadeh, Hemam., Mohidin, Hasmah., Sekeran, Mohamad., Jong, Vivien., Husen, Rafidah., Chan, Thye Huat. &amp; Marvin, M. Z.</i> <i>Universiti Teknologi MARA, Cawangan Sarawak, Kota Samarahan</i>
1000 – 1015	<b>Improvement of Fertilizer Efficiency Using Biochar - Compost Treatments</b> <i>Mahammad Shariful Islam, <u>Susilawati Kasim</u> &amp; Effyanti Mohd Shuib</i> <i>Universiti Putra Malaysia</i>

1015 – 1045	<b>COFFEE BREAK &amp; BOOTH EXHIBITION</b>
	<b>SESSION 4: CARBON MARKET AND BIOECONOMY</b> <i>Chairperson: Assoc. Prof. Dr. Mohamad Amran Mohd Salleh</i>
1045 – 1115	<b>Plenary 4</b> “Biochar May Convert Rice Cropping Fields into a Greenhouse Gas Sink, not a Source” <b>PROF. DR. PIL JOO KIM</b> <i>Gyeongsang National University, South Korea</i>
1115 – 1130	<b>Unlocking Biochar Potential in Malaysia: A Multi-Stakeholder Strategy to Identify Biochar Project Viability for the Voluntary Carbon Market in Malaysia</b> <i>Pek, Ee Siew</i> <i>Sunway University, Malaysia</i>
1130 – 1145	<b>Biowaste Valorization to Biochar: Multidimensional Use in the Future Bioeconomy</b> <i>Kataki, Rupam.</i> <i>Tezpur University, India</i>
	<b>SESSION 5: BIOCHAR AS WASTE MANAGEMENT TOOL</b> <i>Chairperson: Dr. Daljit Singh Karam Singh</i>
1145 – 1200	<b>Exploring the Synergistic Effect of Palm Kernel Shell Biochar and Nano-hydroxyapatite as a Green Adsorbent for the Removal of Copper in Water</b> <i>Noor Sharina Mohd Rosli, Lim Zhi Qi, Rosazlin Abdullah, Jamilah Syafawati Yaacob &amp; Fathiah Mohamed Zuki</i> <i>Universiti Malaya</i>
1200 – 1215	<b>Microwave-assisted Activation of Oil Palm Fronds for Treatment of Dye Wastewater</b> <i>Yong Soon Kong</i> <i>Universiti Teknologi MARA, Shah Alam</i>

1215 – 1245	<p><b>E-POSTER SESSION (One Minute Pitch)</b>  <i>Moderator – Dr. Nur Sa’adah Abdul Halim</i></p>
1245-1415	<p><b>LUNCH &amp; BOOTH EXHIBITION</b></p>
1415 – 1600	<p><b>FORUM</b>  <i>Biochar for a Sustainable Malaysia: Integrating Science, Economy &amp; Environment</i></p> <p><i>Panelists</i></p> <ol style="list-style-type: none"> <li><b>1. Mr Murugesu M Narasimha</b>              Managing Director              VATA VM Sdn. Bhd.</li> <li><b>2. Assoc. Prof. Dr. Hasmah Mohidin</b>              Academician              Faculty of Plantation and Agrotechnology,              Samarahan Campus, UiTM Sarawak</li> <li><b>3. Mr. Trevor Richards</b>              Secretary              Biochar Network New Zealand</li> </ol> <p><i>Moderator</i>  <b>Dr. Keeren Sundara Rajoo</b>              Institute of Ecosystem Science Borneo, UPM Sarawak Campus</p>
1600 – 1630	<p><b>CLOSING CEREMONY</b>  <b>Assoc. Prof. Dr. Mohamad Amran Mohd Salleh</b></p>
1630	<p><b>REFRESHMENT</b></p>

LIST OF POSTER PRESENTATION	
1.	<p><b>Comparative Characterization of Pineapple Leaf Biochar at Different Temperatures</b></p> <p><u>Mahdian, Suraiya</u>, Mohidin, Hasmah., Khalid, Khadijah., &amp; Abdullah, Rosazlin.</p> <p>Universiti Teknologi MARA, Cawangan Sarawak</p>
2.	<p><b>The Effect of Wood Waste Biochar and Coconut Shell Biochar Application on Growth and Yield of Kangkung (<i>Ipomoea reptans</i> Poir.)</b></p> <p><u>Zaitun, Dara</u>., Pramayudi, Nur., Ahya, Miftahul., Darusman, Darusman., Syakur, Syakur. &amp; Hidayat, Taufan.</p> <p>Universitas Syiah Kuala, Banda Aceh, Indonesia</p>
3.	<p><b>Sustainable Soil and Organic Matter Managements with Biochar for Reducing Straw Burning, Greenhouse Gas Productions, and Their Influencing Factors in Northwest India</b></p> <p>Sahara, I., <u>Inubushi, K.</u>, Anzai, S., Sudo, S., Nishihara, E., Chandra, M., Diptanu, B., Prasann, K., Gaurav, S., Ohshima, H., Kato, T., Hayashida, S. &amp; Patra, PK</p> <p>Tokyo University of Agriculture</p>
4.	<p><b>Improving Yield Through Biochar Application in Kailan Cultivation</b></p> <p><u>Hamidon, Azimah</u>., Tajidin, Elliza., &amp; Yusoff, Siti Fairuz.</p> <p>University Malaysia Terengganu</p>
5.	<p><b>The Effect of Biochar Application on the Aggregate Stability and Water Retention of the Soil</b></p> <p><u>Khasifah Muhamad</u></p> <p>Malaysian Agricultural Research and Development Institute (MARDI)</p>
6.	<p><b>Evaluation of Sawdust Biochar on Plant Nutrient and Growth of Kelempayan</b></p> <p>Ahmad, Rozita., <u>Hashim, Siti S.</u>, Mohamad Afandi, Nurul I, Khadiran, Tumirah, Awang, Khairul. &amp; Elham, Puad.</p> <p>Forest Research Institute Malaysia</p>

7.	<p><b>The Viability of Vetiver Grass Biochar and Pineapple Waste Fermented Liquid Fertilizer Mixed for Hydroponically Organic Lettuce</b></p> <p><i><u>Sekeran, M. A. S., Idris, Juferi., Aleiadeh, Hemam., Jong, Vivien Y. M., Jamil, M.F., Chan, Thye Huat., Toh, Marvin M. Z., Man, Sulaiman, Hussien, Rafidah., &amp; Mohidin, Hasmah.</u></i></p> <p><i>Universiti Teknologi MARA, Cawangan Sarawak, Samarahan</i></p>
8.	<p><b>Effect of Different Biochars on Oil Palm (<i>Elaeis guineensis</i> Jacq.) Seedlings Growth and Nutritional Status at the Nursery Stage on Acidic Soil</b></p> <p><i><u>Aleiadeh, Hemam., Idris, Juferi., Sekeran, Mohamad., Man, Sulaiman., Mohidin, Hasmah., Jong, Vivien Y. M., Husen, Rafidah., Chan, Thye Huat., &amp; Marvin, M.Z.</u></i></p> <p><i>Universiti Teknologi MARA, Cawangan Sarawak, Samarahan</i></p>
9.	<p><b>Effect of Plant-based Bokashi Compost and Rice Husk Biochar on the Growth Performance of Lettuce (<i>Lactuca sativa</i> L.)</b></p> <p><i><u>Raazmi, M. D., Shu, G. L., Manzoor, M. &amp; Tajidin, N. E.</u></i></p> <p><i>Universiti Putra Malaysia</i></p>
10.	<p><b>Youth Perception Towards Biochar Application</b></p> <p><i><u>Saad H.M. &amp; Jalil, Mahanom</u></i></p> <p><i>Universiti Malaya</i></p>
11.	<p><b>Physico-Chemical Properties of Oil Palm Empty Fruit Bunch (EFB) and Oil Palm Kernel Shell (PKS) Biochar Under Two Different Temperatures</b></p> <p><i><u>Mohd Kamal, Muhammad Ayub, Abu Sari, Norazlina, Othman, Nur Maizatul Idayu, Abdullah, Rosazlin &amp; Mohd Rosli, Noor Sharina</u></i></p> <p><i>Universiti Teknologi MARA, Cawangan Melaka, Kampus Jasin</i></p>
12.	<p><b>Effect of Soilless Growing Media Formulation With Biochar Amendments on Growth and Flowering Performances of Native Ornamental Plants</b></p> <p><i><u>Sarah Baharudin, Thohirah L. Abdullah, Rosenani A. Bakar</u></i></p> <p><i>Universiti Putra Malaysia</i></p>

13.	<p><b>Characterisation of Biochar Three in One (Biotron) Corn Cob (BTJ) as Ameliorant and Organic Fertiliser</b></p> <p><i>Budiono, Gusti Irya Ichriani, Fakhrrur Razie, Sunardi</i></p> <p><i>Lambung Mangkurat University, Indonesia</i></p>
14.	<p><b>Unveiling the Potential of Oil Palm Empty Fruit Bunch Biochar Produced via Microwave-Metal-Assisted Pyrolysis for Renewable Energy: Properties for Solid Fuel Applications</b></p> <p><i>Shaifulazuar Rozali, Nur Hasniza Mohd Hanafi, Suriani Ibrahim</i></p> <p><i>Universiti Malaya</i></p>
15.	<p><b>Cost Improvement for Scheduled Waste Handling Through New Technology (Biochar)</b></p> <p><i>Muhammad Farih Zaidulakhir Bin Sakry</i></p> <p><i>Toray Plastic Malaysia</i></p>
16.	<p><b>Effects Of Plant Density and Biochar Derived from Spent Mushroom Waste on Growth and Quality Performance of Melon Manis Terengganu (<i>Cucumis melo</i> Var Inodorus Cv. Melon Manis 1)</b></p> <p><i>Lye, Yi Cheng, Wan Sembok, Wan Zaliha</i></p> <p><i>Universiti Malaysia Terengganu</i></p>

P-2

## THE EFFECT OF WOOD WASTE BIOCHAR AND COCONUT SHELL BIOCHAR APPLICATION ON GROWTH AND YIELD OF KANGKUNG (*Ipomoea reptans* Poir.)

Zaitun, Zaitun<sup>1,4\*</sup>, Pramayudi, Nur<sup>2</sup>, Ahya, Miftahul<sup>2</sup>, Darusman, Darusman<sup>3,4</sup>, Syakur, Syakur<sup>3,4</sup>, Hidayat, Taufan<sup>1,4</sup>

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### INTRODUCTION

Kangkung is a vegetable that belongs to the Convolvulaceae family. One effort to meet consumer needs is to increase production by providing biochar to agricultural land. Biochar plays a role in increasing soil organic matter, soil fertility and plant production. The application of biochar can overcome soil degradation and maintain agricultural productivity in sustainable agriculture. One of the main advantages of biochar is its ability to remain in the soil for a longer period of time, decomposition process, and increase soil fertility (Tang *et al.*, 2013). This research aims to determine the effect of wood waste biochar and coconut shell biochar application on the growth and yield of kangkung plants.

### MATERIALS AND METHODS

The research location was at the Biochar Research Station at Universitas Syiah Kuala from September 2022 to January 2023. This research used a non-factorial Randomized Block Design with 5 replications. The research treatments: control, wood waste biochar 500 g m<sup>-2</sup>, wood waste biochar 1000 g m<sup>-2</sup>, coconut shell biochar 500 g m<sup>-2</sup>, coconut shell biochar 1000 g m<sup>-2</sup>.

The raw materials for biochar were wood waste and coconut shells. Biochar was made using the Kon-Tiki equipment (Anjani *et al.*, 2021). The plot measures 1 m x 1 m, height 30 cm and distance between plots 1 m. Cow manure as basic fertilizer 10 t ha<sup>-1</sup>. Biochar was applied to the plot according to the treatment and incubated for 7 days before planting. During the incubation process, watering is carried out to maintain soil moisture (Sa'dah *et al.*, 2022). Kangkung seeds were planted with 2 seeds per hole with a spacing of 10 cm x 20 cm.

### RESULTS AND DISCUSSION

The lowest plant height was in the control and the highest in the coconut shell biochar 500 g m<sup>-2</sup> treatment (Table 1). Biochar has the ability to absorb nutrients and water, so it has a positive influence in ensuring the availability of nutrients needed for plant growth. This is in accordance with research by Rostaliana *et al.* (2012), which states that biochar has a positive impact on plant length growth. The lowest number of leaves was found in the control and the highest was found in the coconut shell biochar 500 g m<sup>-2</sup> treatment (Table 1). This was in accordance with the opinion of Guzali *et al.* (2016) that the increase in plant height is correlated with the large number of leaves.

The lowest plant weight was in the control and the highest in coconut shell biochar 500 g m<sup>-2</sup> (Table 2). This was in accordance with the opinion of Rahayu *et al.* (2020) that the use of biochar from coconut shells has the ability to retain nutrients in the soil, so that nutrients are more efficiently absorbed by plants and distributed to all parts of the plant and increase the fresh weight of the plant.

**Table 1.** Average of height and number of leaves of kangkung plants with biochar treatments

Treatment	Plant height (cm)				Number of leaves (total)			
	5	10	15	20	5	10	15	20
	DAP	DAP	DAP	DAP	DAP	DAP	DAP	DAP
Control (without biochar)	4.34 <sup>a</sup>	7.70 <sup>a</sup>	16.14 <sup>a</sup>	26.32 <sup>a</sup>	2.52 <sup>a</sup>	5.28 <sup>a</sup>	12.20 <sup>a</sup>	29.36 <sup>a</sup>
Wood waste biochar 500 g m <sup>-2</sup>	4.52 <sup>ab</sup>	8.51 <sup>b</sup>	17.82 <sup>b</sup>	30.09 <sup>b</sup>	4.00 <sup>b</sup>	7.70 <sup>b</sup>	14.83 <sup>b</sup>	35.03 <sup>b</sup>
Wood waste biochar 1000 g m <sup>-2</sup>	4.38 <sup>a</sup>	8.34 <sup>ab</sup>	19.26 <sup>c</sup>	30.04 <sup>b</sup>	3.48 <sup>b</sup>	7.20 <sup>b</sup>	15.38 <sup>b</sup>	37.84 <sup>c</sup>
Coconut shell biochar 500 g m <sup>-2</sup>	4.80 <sup>b</sup>	8.60 <sup>b</sup>	19.18 <sup>c</sup>	31.00 <sup>b</sup>	3.60 <sup>b</sup>	7.52 <sup>b</sup>	15.68 <sup>b</sup>	38.12 <sup>c</sup>
Coconut shell biochar 1000 g m <sup>-2</sup>	4.76 <sup>b</sup>	9.50 <sup>c</sup>	20.36 <sup>c</sup>	30.64 <sup>b</sup>	3.56 <sup>b</sup>	7.72 <sup>b</sup>	15.56 <sup>b</sup>	37.88 <sup>c</sup>

**Table 2.** Average of fresh weight of Kangkung plants with biochar treatments

Treatment	Fresh weight (g per 0.25 m <sup>2</sup> )
Control (without biochar)	265.80 <sup>a</sup>
Wood waste biochar 500 g m <sup>-2</sup>	276.60 <sup>ab</sup>
Wood waste biochar 1000 g m <sup>-2</sup>	325.20 <sup>b</sup>
Coconut shell biochar 500 g m <sup>-2</sup>	364.80 <sup>c</sup>
Coconut shell biochar 1000 g m <sup>-2</sup>	360.40 <sup>c</sup>

## CONCLUSION

Coconut shell biochar treatment of 500 g m<sup>-2</sup> had a significant effect on plant height, number of leaves and fresh weight of kangkung plants.

## ACKNOWLEDGEMENTS

This research was supported by Research Center for Biochar and Sustainable Tropical Forests, Universitas Syiah Kuala, Banda Aceh, Indonesia

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