Wadah

SIG

EMiBio

EMiBio: AGRICULTURE MEETS TECHNOLOGY

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LET'S GET TO KNOW EMIBIO!

EMiBio is one of the most prominent and active Special Interest Group (SIG) of UiTM Cawangan Negeri Sembilan. Their primary aim is to empower modern agriculture by associating modern technologies that can enhance agricultural qualities. In achieving their aim, they have strategized on conducting effective research, promoting research collaborations, public knowledge sharing, and organizing seminars in propagating modern agricultural ideologies. The specific research interest area is being portrayed in the EMiBio acronym, "Environmental MIcroBIOlogy". EMiBio is focusing on the association of microbiology technology in intensifying environmental sustainability.

The official EMiBio's logo portrays a visualization of the deoxynucleic acid (DNA) as the core structure of a colorful tree. The multiple colors concept was to represent the multidisciplined research backgrounds of the dedicated research members behind EMiBio, all united to realizing the aim of the group.

The "DNA tree" embodies the implication of the major focus field which is Agrotechnology which covers flora and fauna. The intention of choosing DNA as the core that upholds the tree was to convey the efforts they will take as a team to scrutinize their findings in accomplishing the objectives of their research. To an extent, the colorful leaves and fruits portray the outstanding discoveries they would achieve after attaining their goals and aims.

EMiBio is a result of synergy between vibrant researchers with different expertise. The idea of the group formation was first sparked by their present leader, Dr. Izzati Adilah Azmir. Her research background is in Conservation Biology (aquaculture genetics and reproduction study). EMiBio's current active members are Dr. Mu'adz Ahmad Mazian (Molecular Biotechnology; cell signaling and proteomic study), Dr. Muhammad Aidil Ibrahim (Material Science; DNA-based biosensor study), Dr. Hisham Mohd Nooh (Industrial Biotechnology), Miss Amirah Sharif (Biochemistry), and the associate members are Dr. Siti Nor Atika Baharin (Polymer Chemistry) and Mdm. Siti Nursyazwani Maadon (Plant Biotechnology; plant tissue culture study). They are certain, having members with varying research backgrounds can be advantageous as they can contribute to the research objectives from different perspectives.

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In realizing the vision and mission of EMiBio, the synergy between the group members will provide an opportunity to strengthen their expertise and improve the quality of their research activities.

PRECISION FARMING: FROM GARDEN TO TABLE

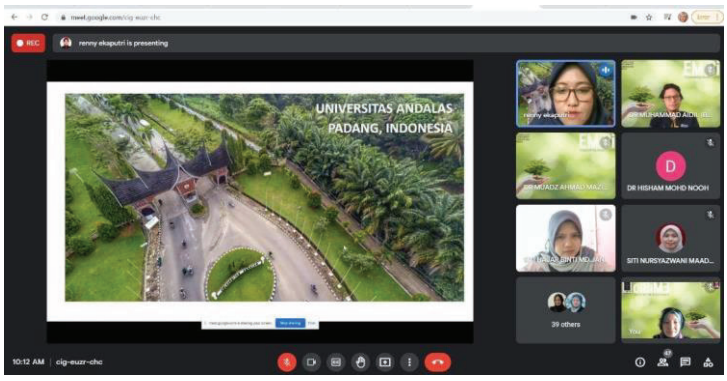
In September 2021, EMiBio has successfully organized an International Webinar Towards Greener Earth series which comprised of several sharing sessions on the current practice of modern agriculture. One of the sharing sessions was entitled "Precision Farming: from Garden to Table" presented by Dr. Renny Eka Putri, a senior lecturer at the Department of Biosystem and Agricultural Engineering, Universitas Andalas, Indonesia.

Dr. Renny obtained her doctoral degree in the field of Automation and Mechanization Engineering from Universiti Putra Malaysia. She has over 15 years of experience in teaching Instrumentation and is actively involved in the Indonesia Society of Agricultural Engineering (ISAE) and Malaysia Society of Agricultural Engineering (MSAE). Dr. Renny is an expert in precision farming, where she uses information-based technology for the agricultural management system to ensure optimum profit, productivity, sustainability in agricultural products, and focuses to minimize farm labor by automation.

Dr. Renny initiated her sharing session by acknowledging the importance of the paddy fields in ASEAN countries as rice is an important staple food in this region. In achieving 100% self-sufficiency of rice production, the ASEAN countries have to increase the annual average paddy yield. In order to achieve this, Dr. Renny suggested three methods which are by planting new high yield rice varieties, adopting precision technology, and increasing the area of rice production.

From left: Miss Amirah, Dr. Mu'adz, Dr. Izzati, Dr. Aidil, Mdm. Nursyazwani, Dr. Hisham, and Dr. Atika.

"Precision Farming: from Garden to Table" program poster



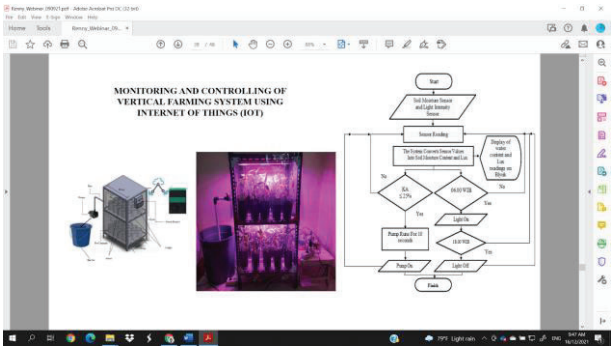
Introduction by Dr. Renny during the virtual sharing session

In this sharing session, Dr. Renny focused on the application of modern technologies in handling crops on the mission to increase crop yield production. Four major areas are precision farming, smart farming, vertical farming, and urban farming. Precision farming involves the application of technology in collecting field information in order to evaluate optimum sowing density, estimate fertilizers and other input needs, and accurately predict crop yields. Dr. Renny also introduced a number of high-tech machineries adapted with GPS systems and complex sensors that were used to harvest crops while providing data on the amount and quality of crop yield in situ.

On-site picture of data collection while harvesting, all in one go. (images are taken from Dr. Renny's presentation slide)

From the data collected, coordination of low crop yield can be detected so that more fertilizer can be applied accordingly. This, in turn, can save costs for unnecessary fertilizing at the wrong areas of the plantation.

The critical spots of low crop yield can also be treated if the soil was detected to be problematic in terms of nutrient level or other unsuitable crop growing conditions. For areas where there are limited land availability, Dr. Renny suggested opting for vertical farming. Vertical farming is the condition where crops are grown in stacks through the hydroponic method. Dr. Renny also highlighted the benefits of performing vertical farming whereby the crops grown will not be affected by adverse weather conditions, better use of space, minimize water usage, and most importantly the crops grown will become reliable year-round as they will be grown indoors under controlled condition.



Adopting a high-tech monitoring system to support vertical farming (image is taken from Dr. Renny's presentation slide)

As a conclusion to her sharing session, Dr. Renny restated that by adapting the precision farming technology, farmers can improve crop maintenance, effectively reduce managing costs, and based on data, this method also proved the ability to increase crop yield production and improve crop quality.

The sharing session was attended by an audience with varying backgrounds. Hence supporting EMiBio's mission in disseminating knowledge to the global community on integrating modern technologies in agricultural research and activities.

For any research collaboration intentions or proposals, please contact emibio@uitm.edu.my