



Programme and Abstracts

PIMES

**PLANTATION MANAGEMENT
EXHIBITION & SEMINAR**

15th December 2018

Faculty of Plantation and Agrotechnology
Universiti Teknologi MARA
Melaka Branch, Jasin Campus
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PLANTATION MANAGEMENT EXHIBITION AND SEMINAR 2018 (PiMES)

Melaka, Malaysia

December 15, 2018

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DEAN PREFACE



Assalamualaikum Warahmatullahi Wabarakatuh

My heartiest congratulations go to the Committees for successfully organized PIMES September 2018. PIMES September 2018 enables lecturers and panels from strong industrial background to reflect and share significant ideas, experiences and research findings in the workplace and in partnerships. It is also hoped to encourage collaboration among the lecturers and enhance the quality and performance of the faculty. The research findings derived from this substantial event shall indicate the commitment of lecturers not only in teaching, but also in striving to unfold new knowledge and processes that will benefit the nation. The efforts of our lecturers need to be further extended to a wider audience so that the nation will benefit from the research findings. It is also hoped that, the proceedings will trigger serious thought and more robust research in the field of education as well as plantation and technology so as to help Malaysia achieve Vision 2020.

As we know, agriculture production has increased tremendously today because of the demand from various sectors in the world. To meet the challenges of increasing food demand, techniques and ways should be created to improve productivity, profitability and sustainability of the agricultural system. Industrial agricultural system has led to irretrievably changes in the landscape diversity, soil quality, environment integrity, and natural resource base. This has resulted major questions and curiosity worldwide in relation to the sustainability of agricultural production system. The most significant damage to natural ecosystems and the environment was caused by habitat conversion and corresponding climate change, loss of biodiversity and ecosystem functions, soil erosion and degradation, and pollution from fertilizers and pesticides. Concepts in plant protection have changed in past decades from exclusion or destruction of pest to pest management. Serious problems with pesticides, rapid development of pest resistance, environmental effects of pesticides, and high costs led to development of new approaches and techniques in pest management based on improved knowledge of pest dynamics and their natural enemies, and the interaction between the pest and the crop.

It remains only for me to thank all those who have helped to make this events such a great and wonderful success. Much appreciation is due to the board editor, and reviewers of all papers submitted as well as to all authors whose ideas and contributions ensured rich and lively discussion during the various sessions.

DEAN,

Assoc Prof Dr Asmah Awal

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INTRODUCTION

The PiMES committee and UiTM (Melaka), Jasin Campus residents are very pleased to welcome all participants in the Plantation and Management Seminar (PiMES) which is organized by Faculty and Agrotechnology.

PiMES aims to give an exposure to the students about the procedure to make a poster by extracting information from their final year project. This seminar will sharpen their communication skill as well as they can exchange and share their research result, projects, experiences and new ideas related to all aspects of studies in plantation management and agribusiness, plant sciences, soil sciences, plant protection, plant biotechnology and agricultural engineering. We sincerely hope that you will enjoy and return home with plenty of inspiration to improve agro-industry plantation practices and research activities.

A REVIEW ON SOMACLONAL VARIATION OF *Theobroma cacao*

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ABSTRACT

Theobroma cacao is mainly grown in the tropical regions of the world at rain forest areas and domestically cultivated for its beans production. Tissue culture is one of the important tools for plant breeding and research. The presence of somaclonal variation derived from tissue culture could cause changes in the plant. The change in agronomic traits is the sources to new clones/variants either the traits is positive or negative. In developing somaclonal variation of *Theobroma cacao* each of the tissue culture method has different result. Besides, the problem of somaclonal variation is not only caused by one factor and somaclonal variation is random and unpredictable phenomena. Besides, there is a problem in determine the best method in detecting somaclonal variations in cocoa. These reviews provide an overview of the possible factors of somaclonal variation that may cause by pre-existing variation or tissue culture induced variation. Pre-existing variation factor listed are chimeras, chromosomes aberration and rearrangement, cell cycle and transposable element. Induced variation reviewed are propagation method, explants source, type and concentration of Plant Growth Regulator (PGR), number and duration of subculture, effect of stress and genotype and ploidy level. These papers also review about effect of somaclonal variation either positive, negative or positive-negative effect. Besides, technique to overcome somaclonal variation using morphological detection, physiological/biochemical detection and molecular detection also reviewed. Benefits, negative aspect and risks of somaclonal variation toward human, environment and economy either directly or indirectly by taking consideration of public acceptance also discussed in this paper. Additionally, cocoa tissue culture technique from the past and present such as nucellar somatic embryo, zygotic embryo, somatic embryogenesis, somatic embryo-derived plant (SEP), and temporary immersion system (TIS) also summarized in this review.

Keywords: Theobroma cacao, somaclonal, variation, tissue culture, pre-existing, induced