NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

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Hosted by Dr Amy Choong

The use of beneficial microbes in commercial cropping systems

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Global food security is currently facing many challenges. Increased food production is needed to feed growing populations, however this is increasingly challenging when faced with restrictions of land availability, climate change, increased fertiliser costs and chemical resistance/removal. Farmers and producers need to consider sustainable production using IPM, improved cropping systems and biological control strategies in-order-to continue to feed the planet.

Plants and microbes have co-evolved intimate relationships and the microbiome represents one of the key drivers of overall plant health and productivity. Microorganisms, applied either above or below ground, are now a key player in the future of sustainable cropping systems and there is an ever-increasing demand for beneficial microbial products globally.

Arbuscular mycorrhizal fungi (AMF) colonise plant roots and through their symbiotic relationship supply the plant with nutrients (including phosphorous), while benefiting from a plant's photosynthetic products. They are known to alleviate stress, directly and indirectly, from abiotic (drought, heat, climate extremes, etc.) and biotic factors (pest and pathogen). Other beneficial microbes are also well known to have advantageous affects for plant growth and health such as Plant Growth Promoting Rhizobacteria (PGPR's), Endophytes and Trichoderma.

At NIAB East Malling we are investigating how increasing the abundance of beneficial microbes in soil and substrates through amendments or management practices can benefit farmers and ensure sustainable cropping. The use of these microbes however poses new challenges to farmers and producers and further understanding is needed to incorporate them into commercial farming systems.

About the Speaker

Dr Louisa Robinson-Boyer is an applied microbiologist specialised in development and application of beneficial microbes for plant protection and sustainable production systems. With over 20 years of experience in the use plant growth promoting rhizobacteria (PGPR) and Arbuscular Mycorrhizal Fungi (AMF) for increasing plant health, water and nutrient use efficiency in soft and top fruit. Current research focuses on plant response to AMF and PGPR and the possible mechanisms responsible for the observed benefits to plants. Current projects are funded by IUK, BBSRC, British council Institutional links and Horizon 2020. Work includes the role of beneficial microorganisms in tree fruit, soil microbiome analysis and rice blast disease.