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Development of biofertilizers for Strawberries: a microbial biofilm

approach

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1Department of Science and Technology, UvaWellassa University, Badulla, Sri Lanka, 2Microbial Biotechnology Unit, National Institute of Fundamental Studies, Kandy, Sri Lanka, and 3Department of Botany, University of Peradeniya, Peradeniya, Sri Lanka (*email: darshani@uwu.ac.lk) Abstract: The usage of heavy doses of chemical fertilizers for crops like strawberry is associated with many environmental and health problems. Thus, the current study focused on developing a biofertilizer for strawberries by using the microbes originating in the strawberry and wild strawberry rhizosphere. Cultivated and wild strawberry rhizosphere associated fungi and bacteria were isolated and screened for strawberry growth promotion. Fungal-bacterial biofilms (FBBs) were developed using those microbes. The potential use of developed FBBs as biofilm biofertilizers (BFBFs) was evaluated with reduced rates from the recommended dosage of chemical fertilizers for strawberry, in glasshouse and field experiments. A simple FBB developed from strawberry growth promoting Enterobacter spp. and Aspergillus spp. together with 50% of the recommended chemical fertilizers significantly increased the strawberry yield in the glasshouse experiment. The same treatment improved the quality of fruits over the 100% chemical fertilizer application in the field trial. In terms of fruit yield, FBB with 50% of the recommended chemical fertilizers was 152% more profitable than 100% chemical fertilizers treatment in the glasshouse experiment. It was 31% more profitable in the field experiment. Thus, the biofilm developed from Enterobacter spp. and Aspergillus spp. wasfound to be a potentialmicrobial formulation in strawberry biofertilizations. Further fieldexperiments are needed to investigate the crop response to this biofilm under different soil and climatic conditions.

Keywords: Biofertilizer, Biofilms, Strawberry, Yield