

Biofilmedbiofertilizers Improve yield and Quality of Strawberry (*Fragaria x ananassa*) under Field Conditions

I. D. Singhalage^{1,3,5}, G. Seneviratne¹, H. M. S. P. Madawala²,
K. R. S. C. B. Kahawandala⁴

¹Microbial Biotechnology Unit, Institute of Fundamental Studies, Kandy, Sri Lanka

²Department of Botany, Faculty of Science, University of Peradeniya,
Peradeniya, Sri Lanka

³Department of Science and Technology, Faculty of Science and Technology,
UvaWellassa University of Sri Lanka, Badulla, Sri Lanka

⁴Agricultural Research Station, SeethaEliya, Sri Lanka

⁵Postgraduate Institute of Science, University of Peradeniya, Sri Lanka

ABSTRACT

In order to reduce the usage of heavy doses of chemical fertilizers (CFs), scientist has developed monoculture-based biofertilizers for Strawberry. This study was carried out to evaluate the effect of biofilmedbiofertilizers (BFs), developed using Strawberry rhizospheremicrobial isolates, on the quantity and quality of fruits under field conditions. Treatments were BF, BF + 50% CFs, 50% CFs and 100% CFs. Control was maintained without BFs or CFs. Treatments were applied a week prior to planting of Strawberry (Generation 1) in raised beds followed by continuous application in two month intervals. Yield data were recorded during the first harvesting cycle (10 weeks period after planting).

Samples from the harvest were used to analyze the Total Soluble Solids (TSS), titrable acids and ascorbic acid. Diameter of the plant spread on the ground was measured. Experimental design was Randomized Complete Block Design. Data were analyzed by General Linear Model in Minitab statistical package (version 16). According to the results, early flowering was observed in plants given BF coupled with 50% CFs. Highest average fruit count (14.77 ± 4.62), fruit weight ($62.06 \text{ g} \pm 21.11$) and fruit size ($6.39 \text{ cm}^3 \pm 0.86$) per plant were observed in BF + 50% CFs treatment. It was also observed that at the end of the first harvesting cycle the plants spread was significantly higher ($p < 0.05$) in BF + 50% CFs than the rest of the treatments. TSS of control, 50% CFs, BF and BF + 50% CF was significantly higher ($p < 0.05$) over the 100% CFs. Ascorbic acid content was

significantly higher ($p < 0.05$) in 50% CFs and BF + 50% CFs than the other treatments. Except 100% CFs, all other treatments gave significantly higher TSS/acid ratios. The results of the present study confirmed that BF coupled with 50% of recommended CFseffectively improved the fruitqualityand quantity of Strawberry. Thus, the BF coupled with 50% CFs can be recommended for Strawberry.

Keywords: Strawberry, biofilmedbiofertilizer, chemical fertilizer