

## **DEVELOPING IMPROVED CHEMICAL FERTILIZER AND BIOFILMED BIOFERTILIZER FORMULATIONS TO BE USED IN RATHNAPURA TEA ESTATES**

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Combined application of biofilmed biofertilizers (BFBFs) and 50% of TRI recommended chemical fertilizers (CF) for tea showed moderate yields in Rathnapura. Leaf analysis revealed that this was due to limited N supply in the soil. Therefore, present study was undertaken to improve mineralization of soil N with newly developed CF and BFBFs formulations to be used in Rathnapura. A soil leaching tube experiment was conducted under laboratory conditions with all possible combinations of existing and newly formulated CF and BFBFs at the rates of 50% or 100% CF alone or together with the BFBF. The BFBFs alone were also used as reference treatments. Soil alone without amendments served as the control. All treatments were replicated three times in leaching tubes and arranged in a Complete Randomized Design. Mineral N was recovered in every two weeks by leaching with 100 ml of 0.01M CaCl<sub>2</sub>, followed by a mineral solution. Organic matter content, microbial biomass C, N and soil texture were measured before and after the experiment. Available N, P and exchangeable K contents in leachates were determined. When new BFBF having a newly isolated fast growing fungus was coupled with the new 50% CF formulation, it tended to establish a larger potentially mineralizable N pool with increased N and P mineralization, compared to existing formulations. Increased turnover rate of the microbial biomass established from the new BFBF having the new fungus may have enhanced N mineralization process, which led to improve N release. However, K release was not sufficient in the treatment. Thus, further studies are needed to increase K release by changing proportion of K in the new CF formulation.

**Key words:** Biofilms, Chemical fertilizer, Microbial biomass, N mineralization