

IMPROVING YIELD AND PROCESSING QUALITY OF POTATO THROUGH BIOCHAR AND VERMICOMPOST MANAGEMENT

Tuhin Suvra Roy*

Executive Summary

Quality potato is the main constraint for the expansion and improvement of potato processing industry in Bangladesh. Application of biochar and/or vermicompost with required chemical fertilizers may improve its processing quality. From this perspective, an experiment was carried out in the research field of Sher-e-Bangla Agricultural University (SAU), Dhaka, Bangladesh from November, 2021 to April, 2022 to find out the response of biochar and vermicompost on yield and quality of potato. The experiment consisted of two factors. Factor A: Biochar levels (4) viz., B₁: control (0 t ha⁻¹), B₂: 1.5 t ha⁻¹, B₃: 3.0 t ha⁻¹, and B₄: 4.5 t ha⁻¹. Factor B: Vermicompost levels (4) viz., Vm₁: control (0 t ha⁻¹), Vm₂: 1.5 t ha⁻¹, Vm₃: 3.0 t ha⁻¹ and Vm₄: 4.5 t ha⁻¹. The two factors experiment was laid out in a split-plot design with 3 replications. The results revealed that biochar and/or vermicompost had significantly influenced on the most of the yield and quality contributing parameters studied under this experiment. Average tuber weight, tuber yield, marketable tuber yield, yield of potato for chips and French fries production increased with increasing biochar and/or vermicompost levels. In case of quality parameters such as, specific gravity, dry matter and starch content also increased with increasing biochar and vermicompost levels, but one of the harmful constituent of potato such as reducing sugar level decreased with increasing their levels. Among the 16 treatment combinations, the maximum tuber yield (32.47 t ha⁻¹), marketable yield (32.07 t ha⁻¹) and yield of potato for French fry production (6.37 t ha⁻¹) were produced from B₄Vm₄ which was statistically similar to B₄Vm₃, B₃Vm₄ and B₃Vm₃, respectively. Though the combination of B₄Vm₄ showed superior performance in quality aspects such as specific gravity (1.068 g cm⁻³) and starch content (18.45 mg g⁻¹FW), but B₄Vm₃, B₃Vm₄ and B₃Vm₃ also showed statistical similar values. Finally, it may be concluded that the potato growers may apply 3 t ha⁻¹ each of biochar and vermicompost along with recommended dose of chemical fertilizers (350-220-250-120-10 kg ha⁻¹ of Urea, TSP, MoP, Gypsum and Zinc sulphate (mono-hydrate), respectively (Anon., 2017) for better yield and good quality potato using BARI Alu-25 under the prevailing climatic and soil condition of AEZ-28 (Madhupur Tract) for producing good quality potato without sacrificing yield.

*Professor., Dept. of Agronomy, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh