

EFFECTS OF INTEGRATED MANAGEMENT OF NITROGEN THROUGH UREA FERTILIZER AND VERMICOMPOST ON YIELD AND QUALITY OF POTATO

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Executive Summary

Quality potato is the main constraint for the expansion and improvement of potato processing industry in Bangladesh. **Integrated management of nitrogen (N) through urea fertilizer and vermicompost** with recommended dose of other chemical fertilizers may improve its quality. To optimize potato production, an integrated nitrogen management approach involving urea and vermicompost is examined in this study. The aim is to evaluate the impact of this integrated approach on potato yield, quality, and sustainability. From this perspective, an experiment was carried out in the research field of Sher-e-Bangla Agricultural University (SAU), Dhaka, Bangladesh from November 2022 to April 2023 to find out the response of integrated approach of N through urea and vermicompost on yield and quality of potato. The experiment consisted of two factors. Factor 1: 4 potato variety viz., V_1 = BARI Alu-68 (Atlantic), V_2 = BARI Alu-29 (Courage), V_3 = BARI Alu-25 (Asterix) and V_4 = BARI Alu-28 (Lady Rosetta) and factor 2: 5 different combination of N fertilizer and vermicompost, T_1 = 100% Recommended dose (RD) of N fertilizer + 0 vermicompost, T_2 = 95% RD of N through urea fertilizer + Rest 5% RD of N from vermicompost, T_3 = 90% RD of N through urea fertilizer + Rest 10% RD of N from vermicompost, T_4 = 85% RD of N through urea fertilizer + Rest 15% RD of N from vermicompost and T_5 = 80% RD of N through urea fertilizer + Rest 20% RD of N from vermicompost. The two factors experiment was laid out in a split-plot design with 3 replications. The results revealed that integrated approach of N and 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 production increased with increasing N through vermicompost. In case of quality parameters such as, specific gravity, dry matter and starch content also increased with increasing N through vermicompost and decreasing N through urea. One of the harmful constituents of potato such as reducing sugar level decreased with increasing vermicompost levels. Among the 16 treatment combinations, the maximum tuber yield (38.82 t ha^{-1}), marketable yield (37.20 t ha^{-1}) V_4T_4 which was statistically similar to V_4T_5 . Though the combination of V_4T_4 showed superior performance in quality aspects such as specific gravity (1.090 g cm^{-3}) and starch content ($20.907 \text{ mg g}^{-1}\text{FW}$), but B_4T_5 , also showed statistical similar values. Finally, it may be concluded that the potato growers may apply 85% RD of N fertilizer (297.5 kg ha^{-1} urea) + Rest 15% RD of N from vermicompost (11 t ha^{-1}) along with RD other fertilizers prescribed by Tuber Crops Research Centre, Bangladesh Agricultural Research Institute 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.

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