Yield response and economic performance of elite vegetable cultivars to good agricultural practices within intensified farming systems in selected locale of Tanzania

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Abstract

Agronomic and economic performance of farmer selected and preferred elite Tomato (*Solanum lycopersicum*); African eggplant (*Solanum aethiopicum*) and Amaranths *(Amaranthus cruentus*) cultivars were undertaken in 4 communities located in the Babati district, Manyara region of Tanzania using the mother/baby field trial approach. The trials were carried out over 2 annual production seasons to study the performance of introduced technological packages viz: use of elite vegetable varieties complemented with selected good agricultural practices such as healthy seedlings, good agronomic practices and integrated pest and disease management in comparison with standard farmer practices, in terms of yield and profitability. The randomized complete block design involving one mother plot and three baby plots as replicates of improved practices per village were set up. Input-output data from the 16 plots were analyzed using One-way ANOVA. Using healthy seedlings, right spacing, weed control, joint application of farmyard manure and inorganic fertilizer along with judicious pesticide use, leads to significant yield increases ($p<0.001$) of up to 64.75t/ha compared to 28.28t/ha (BCR=8.5) and 53.97t/ha compared to 23.04t/ha (BCR=4.50) for Tomato and African eggplant respectively. For Amaranths, the yield increase under improved technologies was 59.67% higher from 8.46t/ha to 14.91t/ha. The application of a single technology such as healthy seedlings alone contributes to slight to yield increase compared to application of multiple good agricultural practices; 18.12%, 24.68% and 14.20% for tomato, African eggplant and Amaranths respectively compared to the business-as-usual scenario. Thus, simultaneous adoption of multiple good agricultural practices generates much higher yields and returns compared to a single technology.

Keywords: Mother-baby demonstration trials, African eggplant, Amaranth, Tomato, Good agricultural practices, Benefit-cost ratio (BCR), Agricultural technology adoption, Randomized complete block design