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Influence of Keneka SK bio-stimulant on yield of maize in the savannahs of Ghana

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Abstract

Maize (*Zea mays*) is one of the most important staple crops in Ghana. It has numerous uses, aside been used as food for humans and feed for livestock, it has industrial uses. Despite the crop numerous uses the yields obtained by farmers in Ghana especially in the northern part is relatively low (< 1 t ha^{-1}). This has come as a result of low soil fertility, coupled with little external inputs use. Much researchhas been done employing the use of inorganic fertilisers to increase crop production. However, the cost associated with the inorganic fertilisers are high. Also, these fertilisers may have negative impacts on the environment. Technologies that will enhance maize yield and salvage our soils are being advocated for. A field trial was established at Nyankpala and Cheshegu in Ghana to evaluate the efficacy of Keneka SK bio-stimulant on yield of maize and the economic viability of the treatments applied. A randomised complete block design with four replications and an individual plot size of 5 m $\times$ 5 m was used for both experiments. The Keneka SK bio-stimulant was applied as seed coat. Seven treatments namely, a. Keneka SK only, b. Keneka SK + 45–30-30 kg NPK ha^{-1}, c. 45–30-30 kg NPK ha^{-1}, d. Keneka SK + 90–60-60 kg NPK ha^{-1}, e. 90–60-60 kg NPK ha^{-1}, f. Keneka SK + 3 t ha^{-1} Compost and g. No fertiliser were used for the experiment. The results indicated that there was no difference between treatments with Keneka bio-stimulant and those without the bio-stimulant at Nyankpala. However, at Cheshegu treatments with Keneka bio-stimulant performed better than their counterparts without Keneka. The application of Keneka +45–30-30 kg NPK ha^{-1} had a yield advantage of 29 % over 45–30-30 kg NPK ha^{-1} treated plot. From the partial budget and marginal rate of returns analysis, all the treatments have positive net benefits and are economically viable except the combined application of Keneka bio-stimulant and compost at 3 t ha^{-1}. We conclude that Keneka bio-stimulant should not be used alone but should always be added to inorganic fertiliser to achieve maximum maize yield and enhanced soil health.

Keywords: Bio-stimulant, fertiliser, maize, northern Ghana, savannah

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