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Abstract

With current changes in climate there is a need to adapt soil and water conservation practices to the South Sudan zone Burkina Faso. This study was conducted to assess the impact of no-till, tied ridging; ripping and conventional tillage combined with soil fertility management options on sorghum yield in Nadion. The treatments were laid out in a split plot design on a lixisol with a slope of 1.5%. The tillage practices were ranged in main plots and soil fertility management options in the sub-plots. The soil moisture was monitored weekly using the Time Domain Refractometer method and the soil bulk density was evaluated 30 days after planting. Both the sorghum grain and biomass yields were assessed. The tied ridging and zero tillage increased. Application of sorghum straw residues a improved soil water content with additional 20% water content. Conventional tillage decreased soil bulk density at the plowing depth. Combination of compost, NPK, and Urea increased sorghum yield by 74%. The combination of NPK and urea increased it by 50% and the compost increased it by 29% compared to the control (zero input). Conventional tillage led to decrease in yield compared to zero tillage after two years experiment. The zero tillage combined with compost, NPK and urea increased sorghum yield by 28% compared to tied- ridging with the same fertility management options after two years. The results showed that the tied ridges that did not work 20 years ago in the south Sudan zone is now suitable

Key words: Tillage methods, fertility management, soil water content, sorghum yield

Evaluation of Hyk® foliar fertilizer on growth, yield and quality of French Beans (cv. Organdi)

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Abstract

French beans (*Phaseolus vulgaris L.*) are a major vegetable export crop in Kenya and a significant income earner to small scale farmers. French beans are grown for processing, including canning and freezing, and demand is steadily increasing. Poor growth vigor is one of the factors that hinder the realization of high yields and pods of high quality. There is therefore need to develop/ identify new products to increase productivity. The objective of this study was to evaluate a newly introduced concentrated inorganic formulation (Hyk®), for its effect on growth vigor, yield and quality of French bean variety Organdi. Hyk® was applied to the plants at different stages of plant growth in Kirinyaga and Murang'a Counties and evaluated against the commonly used foliar fertilizers Nitro spray® and Calmabon®. The study was laid out in complete randomized design and was replicated three times. Data was collected at 50% flowering and included number of flowers, height of the plant, length and width of the leaves. The Hyk® treated plants had a higher growth rate attaining an average height of 39 cm compared to the control's 37 cm. Hyk® treated plants also had improved yield and quality of the pods,

producing over twice the yield of the control treatments. Cost benefit analysis showed that application of Hyk® to French beans yielded a positive net return. The results show that Hyk® foliar fertilizer can be recommended for use in French bean production.

Key words: Hyk®, French beans, foliar fertilizer, flowering.

Increasing regeneration rate of two sweet potato (*Ipomoea batatas* L.) cultivars on low cost tissue culture media

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Abstract

The cost of tissue culture has been identified as a constraint to uptake of high quality planting materials. Efforts have been going on to develop low cost TC technologies that can help to reduce the cost of seedlings and hence increase adoption. This study was carried out at Kenyatta University aiming to optimize regeneration of two sweet potato cultivars by supplementing low cost media (LCM) with plant growth regulators (PGRs) and to assess somaclonal variations in the regenerated plantlets using morphological features. Nodes of cultivars KEMB 36 and KSP 36 were cultured on LCM supplemented with PGRs as follows; BAP/IAA; 0.1/0.01, 0.2/0.015, 0.3/0.02, BAP/NAA; 0.1/0.01, 0.2/0.015, 0.3/0.02, KIN/IAA; 0.1/0.01, 0.2/0.015, 0.3/0.02, KIN/NAA; 0.1/0.01, 0.2/0.015, 0.3/0.02 and a control with no PGRs. Each treatment had five replicates in a split plot experimental design. The data was subjected to analysis of variance (ANOVA) using SPSS and the means of the number of shoots, nodes, leaves and roots were separated using Tukey's test. The effect of the treatment depended on the genotype, with a significant interaction determined at P 0.05. For both cultivars, untreated control produced the highest mean number of nodes, leaves, roots and plantlet height. Regeneration performance of plantlets weakened with increase in concentration of PGRs. Survival rate of 100% was recorded in BAP 0.2 / NAA 0.015 for KEMB 36 and in BAP 0.2 / IAA 0.015 for KSP 36. There were significant differences (P<0.05) in the means of leaf length and leaf width but no significant differences (P>0.05) for the means of petiole length, petiole diameter, and stem diameter. Leaf shape and color intensity were maintained for the two cultivars. The conclusion is that sweet potatoes have enough endogenous growth regulators to break the dormancy of the auxiliary buds. Callus formed vigorously with increase in PGRs concentration for both cultivars suggesting a potential to induce somaclonal variations in the two cultivars.

Keywords; *low cost tissue culture media (LCM), plant growth regulators(PGRs), sweet potatoes, cultivars, somaclonal variations*

Theme: Innovation, Research and Technology For Global Development

Sub-Theme: Agriculture, Climate Change and Food Security