

ABSTRACT

Regular application of fertilizer, notably nitrogen (N) and potassium (K) is essential for optimum growth and maximum yield of cocoa. The nutrient requirement of cocoa when intercropped with coconut is likely to be different from those grown in monoculture. It is therefore necessary to gather information on the response of cocoa to fertilizer application when grown in association with coconut.

This report examines the results of a study undertaken by the Coconut Research Institute, on the growth and bean yield of cocoa under coconut, in response to different combination of N and K fertilizer in the wet zone. The treatments included all possible combinations of four levels of N ($N_0 = 0$ g, $N_1 = 50$ g, $N_2 = 100$ g, $N_3 = 150$ g/tree/year) and five levels of K ($K_0 = 0$ g, $K_1 = 40$ g, $K_2 = 80$ g, $K_3 = 120$ g, $K_4 = 160$ g/tree/year) arranged in a fully randomized design with two replicates.

Among growth parameters, number of leaves and plant height were not significantly affected by nitrogen (N) and potassium (K) treatments. In contrast, both N and K treatments had a significant and positive response on stem girth and canopy width of cocoa. There was also a positive interaction between N and K for these two parameter with increasing age. Further, N application exerted a greater influence on the percentage of flowering and bearing trees, while response to K application was not consistent. Early growth of cocoa appeared to be dependent more on N fertilizer than K particularly during the first three years. The most effective combination of N and K for obtaining vigorous growth of cocoa was found to be 100 g/N (N_2) and 120 g K_2O (K_3)/tree/year.

With respect to yield components, pod number/tree showed a significant quadratic response to N levels, whereas for K levels there was a linear response. Meanwhile dry bean yield/tree showed a quadratic response to both N and K fertilizer application. The effect of N and K treatments on cumulative pod and dry bean yield/tree showed a similar trend. The other yield components, number of beans per pod and 100 bean weight showed a similar positive response to applied N and K fertilizer. The interaction between N and K fertilizer for all these parameter was also shown to be significant.

Foliar analysis results showed that both N and K content cocoa leaf were influenced by N and K application whereas leaf P was affected only by N application. Leaf Mg content was changed only with higher level of potassium.

There was a consistent increase in nut yield of palms due to intercropping with cocoa.

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The overall results suggest that combination of 100 g N (= 260 kg urea/ha) and 120 g K_2O /tree/year (240 kg muriate of potash/ha) is the optimum N and K requirement of cocoa intercropped with coconut in the wet zone.