

Intercropping Effect of Sweet Potato on the Growth, Development and Yield of Arabica Coffee Grown at Aiyura, Papua-New-Guinea

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ABSTRACT

Four coffee densities viz; 2,667, (pure stand), 1,905 (71%), 1,333 (50%) and 667 (29%) plants per hectare were combined with sweet potato in a replacement series experiment at Aiyura, Papua New Guinea between 1989 and 1995. A zero coffee plot (i.e., 100% sweet potato) was included in the trial. The treatments were replicated four times in a RBD.

The objective of the study was to determine the effect of intercropping sweet potato on the growth, development and yield of tall coffee variety Arusha, and to assess the economic benefits, viability and prospects of permanent foodcrops vs coffee intercropping.

Simple linear regressions calculated between various parameters showed that irrespective of coffee density treatment, the height vs diameter growth ($r = 0.99$), number of bearing primaries vs diameter ($r = 0.99$), number of bearing primaries vs height ($r = 0.99$), number of nodes vs diameter ($r = 0.95$), and number of nodes vs height ($r = 0.95$) were highly correlated. When yield was correlated with various growth parameters, in particular stem diameter, the results showed that the correlation generally weakens as coffee density is reduced from the pure stand.

The LER values showed that when averaged over all the years, intercropping was advantageous at all coffee: sweet potato intercropped treatments. The average MER values over the four cropping seasons showed that at 71% coffee: 29% sweet potato, there was substantial economic gain in intercropping, over both pure stand treatments of coffee and sweet potato. At that plot the relative potential yield reduction data for the component crops, averaged over all years of intercropping, gave no evidence of a suppression of coffee yield.

The Relative Crowding Coefficients indicated that during early stages of intercropping, the annual crop was more aggressive or competitive than the perennial counterpart. The trend of competition changed during later years.