

Yield Response of Arabica Coffee to Spacing and Training Methods in Southwestern Ethiopia

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SUMMARY

Field experiment was conducted between 1996 and 2006 crop years at Metu Research Station. A morphologically compact Arabica coffee cultivar, 74140 was field transplanted in split plot design; where, seven spacing levels (1.00 m x 1.00 m, 1.05 m x 1.05 m, 1.12 m x 1.12 m, 1.19 m x 1.19 m, 1.29 m x 1.29 m, 1.41 m x 1.41 m and 1.58 m x 1.58 m) and two training methods (capping and free growth) were assigned as main and sub-plot treatments, respectively. The result revealed that spacing had significant ($P < 0.05$) impact on coffee yield in 1998/99 crop season. Accordingly, highest and lowest mean clean coffee yields of 2028.87 and 1310.82 kg ha⁻¹ were recorded at closest (1.00 m x 1.00 m) and widest (1.58 x 1.58 m) spacing, respectively. Coffee yield tended to increase linearly with population in over years analysis and across most of the crop seasons. Moreover, the effects of training methods on coffee yield was also considerable in 1999/00, 2000/01 and 2003/04 crop years, where trees in capped plot out yielded significantly the free growth treatment except in 1999/00 crop year. Significant ($P < 0.01$) difference in coffee yield was observed due to crop years; where highest yields were recorded in 2002/03 and 2004/05. Significant ($P < 0.01$) interaction effect was noted between crop seasons and training methods; indicating the lower yield performance of capped trees during the initial two crop seasons and its subsequent superiority over the free growth treatment in the later years. Though the combined effects of spacing on coffee yield was statistically insignificant more yield advantage were noticed as population density increases. In contrast, training treatment, stem numbers had seldom impact on coffee yield. Therefore, it was concluded that planting compact Arabica coffee cultivar at closer spacing of 1.05 m x 1.05 m had enhanced coffee yield at Metu; indicating the long lasting efficiency of close spacing in mid altitude coffee growing area of southwestern Ethiopia. In contrast, increasing the number of bearing heads of individual coffee tree had low yield advantage at closely spaced plots.