

Yield Response of Arabica Coffee Cultivars under Various Tillage and Transplanting Practices in South-western Ethiopia

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SUMMARY

The experiments were carried out at Tepi and Gera Research Centres with the primary objective to investigate the influences of different tillage and transplanting techniques on the yield response of Arabica coffee cultivars. The treatments were arranged in split-split plot design with three to four replicates consisted of 12 trees per plot. In this case, tillage practices, coffee cultivars and depth of transplanting were assigned as main-, sub-and sub-sub-plot treatments, respectively. Four years mean clean coffee yields were recorded and analysed using SAS software. The results at Tepi revealed that tillage had significant ($P \leq 0.05$) effects during the initial crop year. Coffee cultivars significantly ($P \leq 0.01$) differed and the compact cultivar (74110) gave the lowest yield response throughout the study period. The effect of planting depth was, however, not significant. As a whole, conventional holing, compact coffee cultivar and collar level planting gave the least average yield levels from the respective main treatment groups. The open coffee cultivar (75227) significantly ($P \leq 0.01$) out yielded the other coffee cultivars under all tillage practices. The other main and interaction effects did not show significant under the low land Tepi conditions. The results at Gera highland also indicated non-significant differences due to the main and interaction effects for all years, except the significant ($P \leq 0.05$) variation displayed among coffee cultivars during the early crop stage. Unlike at Tepi, tillage had little effect on coffee yield and the compact coffee (74158) was more productive at Gera, suggesting the agro-ecological specific yield advantages of tillage systems and coffee cultivars. At both sites, the main treatment effects, however, did not show consistent yield patterns over years, largely due to the biennial bearing nature of coffee trees. In essence, the contributions of tillage and transplanting practices were more noticed during the early crop stages. Therefore, taking into account, among others, suitable coffee cultivars, available power sources, ecological and socio-economic aspects, soil-plant manipulations should be exercised at the times of field planting with the views to ensure maximum stand establishments and thereby, increase coffee productivity.