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Weed Biomass Production and Cassava Yields in Varying Cassava Cropping Systems

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Abstract

Weed control constitutes the largest portion of labour in cassava cropping in Africa. Weed control is still largely based on manual weeding. A BMGF funded weed management project in Nigeria is seeking agronomic, mechanical and chemical means of weed control to ease the burden on mainly women and children and to increase cassava productivity. Here the results of agronomic measures on weed biomass are reported. Weed biomass was determined at 4, 8, 12 and 24 weeks after planting in a five factorial trial testing two cassava varieties, ridge-tillage versus flat land, intercropping with maize versus monocrop, fertiliser application versus nil and cassava density effects on weed biomass on a coarse textured poor sand soil and a sandy loam of contrasting chemical properties. The trial served to establish the most suitable agronomic measures reducing weed biomass in a system using manual weeding. Weeds were manually removed from all plots after each weed sampling. Weed biomass was larger on sand than on sandy loam, pointing at the need for site specific approaches. Ridge-tillage reduced weed biomass strongest compared with all other measures. Differences between cassava varieties were significant. Intercropping maize and the application of fertiliser had no significant effect on cumulative weed biomass. Differences between treatments at the individual weed samplings show that dynamics of weed growth is influenced by the presence of an intercrop (maize) and fertiliser application. Several factors interacted significantly indicating that the correct factor combination is likely to reduce weed biomass beyond reductions attainable by single factors. On the poor sand soil the combination of ridge-tillage, 12500 cassava plants ha^{-1} as monocrop, variety TME419, with fertiliser application had the second lowest weed biomass (168 g m^{-2}) and the highest cassava fresh root yield (25 Mg ha^{-1}). On the sandy loam highest cassava root yields (28 Mg ha^{-1}) were attained with the treatment combination ridge-tillage, 10000 cassava plants ha^{-1} as intercrop, variety TME419, with fertiliser application, yet had the highest weed biomass production (82 g m^{-2}) as well. On the more fertile soil weed competition appears to be a lesser problem if weed control is conducted early and at the recommended intervals.

Keywords: Cassava, fertiliser, intercropping, tillage, weeds, yield loss

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