Effects of legume cover crop and sub-soiling on soil properties and maize (zea mays l) growth in semi arid area of Machakos District, Kenya

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Abstract

Low crop yields in the semi arid areas of Kenya have been attributed to, among other factors, low soil fertility, low farm inputs, labour constraints and inappropriate tillage practices that lead to pulverized soils. The aim of this study was to determine the effects of legume cover crops (LCC) on soil properties and maize growth in the semi arid area of Machakos District, Kenya. The study was undertaken in farmers’ fields. The field experiments were carried out in a randomized complete block design with four treatments each replicated four times during the 2008/2009 long (LR) and short rain (SR) seasons. The treatments were T1 = maize + dolichos (Lablab purpureus) + subsoiling; T2 = maize + dolichos + nosubsoiling; T3 = maize alone + no subsoiling; T4 = maize alone with subsoiling). Results from the field experiments showed that rainfall amount and its distribution affected the growth and yield of dolichos and maize. There were significant differences in ground cover between the treatments at P = 0.05 in all the different weeks after planting when measurements were taken. The penetration resistance in all the plots ranged from 3.83 - 4.18 kg cm-2 with treatment T4 having the highest and treatment T1 lowest penetration resistance. There were also significant changes in soil N in plots which were under dolichos compared to plots without dolichos. The results obtained in this study also indicated that subsoiling in combination with dolichos had the greatest potential of improving soil properties and crop yields in semi arid environments of Kenya.