

AN ON FARM COMPARISON OF CONSERVATION AGRICULTURE PRACTICES AND CONVENTIONAL FARMER PRACTICES ON SOIL HYDROLOGY AND MAIZE YIELD

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The negative impacts of mid season dry spells on the productivity of rainfed cropping in the smallholder sector of southern African is a well documented. One way of mitigating these impacts is the promotion of conservation agriculture to enhance infiltration and soil water retention. This on farm study was carried out in ward 1 of Insiza District, Zimbabwe. A short season maize (*Zea Mays* L.) variety SC403 was grown under three tillage practices (farmer practice, planting basins and clean ripping), on two soil types: sandy silt loam soil (Soil A) and clay loam soil (Soil B). Cumulative infiltration, soil moisture retention and grain yield were determined for each treatment.

The total rainfall received during the season was 490mm and 513 mm for site A and site B, respectively. For both soil types, cumulative infiltration was highest in planting pits and lowest in clean ripping. Soil A had the highest cumulative infiltration compared to Soil B, yet soil B retained the most moisture. Planting pits showed the highest moisture retention capacity in both soil types. However, clean ripping retained more moisture than farmer practice in soil A, and the least for soil B. Statistically, there was no significant difference in either the cumulative infiltration and the soil moisture retention in the three tillage practices for the same soil type.

In the sandy silt loams, yields of 1648 kg/ha, 1815 kg/ha, 700 kg/ha for farmer practice, planting pits and clean ripping respectively, were observed. For clay loam the yield was 663 kg/ha, 798 kg/ha, 525 kg/ha for farmer practice, planting pits and clean ripping, respectively. There was no significant difference in the yields obtained in the three tillage practices for the same soil type but there was a significant difference in yield between the two soil types. Sandy silt loams had the highest yields.

It was concluded that, planting pits enhance infiltration and produce the highest yields in both soil types and that the lack of statistical differences could be attributed to the above normal rainfall received. It was recommended that additional weeding operations be carried out in the clean ripping practice in the first year as these outgrow the maize crop.

Keywords: Conservation agriculture, infiltration rate, soil moisture, maize.

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