

Abstracts of Ph. D. Thesis

Moisture Conservation Practices and Intra-plot Water Harvesting on Sorghum and Castor Under Semi-Arid Condition

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A field experiment was conducted during 1975-76 and 1976-77 at B. A. College of Agriculture Farm, under semi-arid conditions of Anand to evaluate the technique of intra-plot water harvesting as affected by moisture conservation practices (tillage) and its subsequent utilization by hybrid sorghum and castor. Different components of water budget viz., runoff, evapotranspiration (E_T), soil moisture storage and percolation were also studied for the crops in both with and without water recycling conditions. Ridging and furrowing was found superior among tillage practices for conserving moisture during the crop growth period. Considering the yield values of both the seasons for test crops, hybrid sorghum 'CSH-1' and its ratooning gave the maximum production stability under both below and above average rainfall years. Recycling of runoff

was also found effective in increasing the yield of the crops. The values of E_T were highest under ridges and furrows for sorghum as well as castor when runoff water was not recycled. In respect of sorghum ratoon, the higher values of E_T were recorded under shallow ploughing. When runoff water was recycled it was the highest under shallow ploughing, followed by ridges and furrows and deep ploughing.

Runoff from the test crops was the highest in case of shallow ploughing followed by deep ploughing and ridges and furrows. The soil moisture storage was the maximum for the test crops under shallow ploughing when runoff water was recycled. It was the lowest under ridges and furrows when runoff water was not recycled.

The losses of water and nutrients were of the highest order from shallow ploughing followed by deep ploughing. Soil loss in runoff water was higher under deep ploughing than shallow ploughing. Due to increased depth of ploughing (upto 30 cm) and following ridges and furrows layout, the water use efficiency of the test crops was increased. On the contrary, it was reduced when runoff water was recycled.