

Water Balance Studies of Castor, Fallow and Weed Plots in Arid Zone

Water balance studies of castor, fallow and weed plots was conducted at Central Arid Zone Research Institute, Jodhpur in the year 1964-65. Jodhpur is situated at a latitude $26^{\circ}1'N$, longitude $73^{\circ}02'E$ and an altitude of 210 metres. The soil consists of more than 75% sand and is poor in organic matter and other essential nutrients like N, P and K. The climate is typically arid with low and uneven distribution of rain fall.

Soil moisture data were recorded from four depths of soil *i.e.* 0-25, 26-50, 51-75 and 76-100 cm. The soil moisture was estimated by gravimetric method taking some extra precautionary measures (Jan, 1967). Two soil samples from each plot of the four replications were taken at a distance of 15-20 cm from the plants. Efforts were made to utilise minimum area of land and to avoid duplication of sampling from the same spot. Castor plots were maintained under normal cultivated conditions. Two hand weedings at the age of 30 and 50 days after planting were given. Weed plots were naturally kept without any weeding. Fallow plots were maintained free of weeds with no crop. This was achieved by removing weeds by hand every third day.

Moisture content at various depths of soil in three treatment plots is indicated in Fig. 1a, b, c and d. Moisture content of plots with weeds was minimum followed by castor plots. This variation in soil moisture increased with depth. Weeds alone were capable of removing much more water than a cultivated castor crop. This extra water from weed plots was mainly absorbed from deeper layers of the soil.

Soil moisture content of 0-25 and 26-50 cm depths of soil reached almost to the level of wilting after 10 weeks of planting. Castor is capable of absorbing water from greater depths of soil due to its higher rate of root extension (Jain, 1967). And in the presence of weeds there would be a competition for this soil moisture between the crop and the weeds. Thus, early weeding and clean cultivation is suggested for raising successful crops in these areas.

Cultivated fallow plots were capable of storing little more water than castor plots. However, the amount of water stored was too little to raise a successful subsequent crop. Therefore, losing a crop in *Kharif* expecting its compensation by raising a crop in *rabi* does not seem to be economic in the arid tract of Western Rajasthan.