

Research Paper :

Enhancement in the productivity of *Rabi* sorghum (*Sorghum bicolor* L.) under dryland condition by adopting *in situ* moisture conservation practices on farmers field

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ABSTRACT

The Operational Research project is functioning at Zonal Agricultural Research Station, Solapur with one of the objective to demonstrate the impact of *in situ* moisture conservation techniques viz., ridges and furrow and compartmental bunds under farmers management condition and secondly to popularize the productive technology amongst farmers in the Sarole watershed, Tal. Mohol, Dist. Solapur during the period 2002-03 to 2005-2006. The *in situ* moisture conservation techniques were adopted on 15 farmers field having plot size 0.20 ha. each treatments during *Kharif* and *Rabi* sorghum (M-35-1) was grown as test crop following all recommended practices. The results revealed that, the average grain yield of sorghum was highest in ridges and furrow (9.64 q ha^{-1}), compartmental bunding (8.24 q ha^{-1}) as compared to farmers practice i.e., two harrowing. The per cent increase in grain yield was 17 per cent in ridges and furrow over compartmental bunding and 54 per cent over farmers practice. Similar trend was also noticed in case of fodder yield of *Rabi* sorghum.

Key words : *In situ* moisture conservation, *Rabi* sorghum

Dryland agriculture is a dynamic and highly complex system with the limitation of water for food and fibre production. Dryland agriculture is practiced in arid and semi-arid regions where the water deficiency results due to low and erratic rainfall, its inadequate storage as soil water and absence of other sources of water for irrigation. Effective rainwater management as *in situ* moisture conservation plays vital role to increase and stabilize the yields. This is possible through appropriate *in situ* moisture conservation techniques to capture and harness the rainwater by reducing runoff and soil loss (Sinha *et al.*, 2005). *Rabi* sorghum (*Sorghum bicolor* L.) is the staple food crop of the scarcity zone of Maharashtra. It constitutes about 36 to 38 per cent of total area in the country and 56 per cent in Maharashtra. The rainfall in these areas is inadequate and distribution is erratic, hence the rain water conservation is a crucial factor in stabilizing and stepping up the productivity of dryland crops. Soil and water conservation measures help to improve moisture availability in soil profile for plant growth (Mallappa *et al.*, 1990 and Singh *et al.*, 1990).

In view of the above facts, to test the *in situ* moisture conservation techniques on farmers fields, verification trials were conducted at Operational Research Project village Sarole, Tal. Mohol, Dist. Solapur.

The Operational Research Project was implemented at Sarole watershed, Tal. Mohol, Dist. Solapur during 2001-2005. At the start, basic survey on soil, Socio-

economic and natural resources was carried out. About 68 per cent of the soils are very shallow having 1 to 3 per cent slope and 27 per cent soils are medium to deep. Majority of the farmers are marginal (35 per cent) and small (21 per cent). The average annual rainfall of the watershed is 605 mm. During the period under report, out of five years severe drought was observed for two years (2002 and 2003). A need based technical programme was formulated based on land capability, soil suitability and with PRA technique.

Before inception of the project, the farmers were not adopting the *in situ* moisture conservation practices for *Rabi* sorghum. Monocropping of *Rabi* sorghum was the common practice in medium to deep soils. The farmers were harrowing the land twice before sowing of the *Rabi* sorghum.

MATERIALS AND METHODS

The verification cum demonstration trials on *in situ* moisture conservation practices i.e., ridges and furrow method, compartmental bunding were assessed for refinement on farmers field at Sarole watershed during the year 2002-03 to 2005-06. The field trials treating individual farmer as a replication with three treatments viz., ridges and furrows, compartmental bunding and farmers practice (two harrowing) were conducted on fifteen farmers fields. The trials were conducted on 0.20 ha. area under each treatment. The soils of the