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Response of ridge gourd to various levels of drip and surface irrigation in saline vertisols of canal command, Karnataka

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ABSTRACT

Field experiment was conducted on saline soils of Northern Karnataka at Agricultural Research Station, Gangavati, during *Kharif*, 2004 and *Rabi*/summer, 2005-06 to study the response of ridge guard (cv Mahyco hybrid Sujata) to various levels of drip and surface irrigation The effect of four levels of drip and furrow irrigation [*i.e.*, 0.8 ET, 1.0 ET, 1.2 ET and 1.4 ET] were studied in terms of number of fruits per plant, average fruit weight and fruit yield. The canal water having salinity of 0.20 dS/m and the available shallow well water having salinity of 4.70 dS/m were used for irrigation in case of surface and drip irrigation, respectively. Based on two years study, it was found that ridge gourd response was better under drip irrigation than surface irrigation. Highest yield (11.6 t/ha) was recorded in case of drip irrigation at 1.2 ET followed by drip irrigation at 1.4 ET (10.29 t/ha). While, the lowest yield was recorded under furrow irrigation at 0.8 ET (8.20 t/ha). It was estimated that the threshold soil salinity for ridge gourd was about 5.5 dS/m (R^2=0.46). Build-up in soil salinity (0-90 cm) was observed in both the methods of irrigation. The scarcity of fresh water in arid and semi-arid regions makes saline water a valuable alternative source for irrigation.

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Key words : Salt affected soils, Irrigation methods, Crop performance

INTRODUCTION

The introduction of irrigated agriculture in the arid and semi-arid regions of India has resulted in the development of the twin problem of waterlogging and soil salinization. It is estimated that nearly 8.4 million ha is affected by soil salinity and alkalinity, of which about 5.5 million ha is also waterlogged (Ritzema *et al.*, 2008). In Tungabhadra irrigation project (TBP), the extent of the problem, which was just under 20,200 ha during 1979-80, has risen to over 80,000 ha during 1996-97. Rice-rice cultivation in the head end command of the TBP has seriously affected the equitable distribution of water supposed to be distributed among farmers. In view of this, most farmers of the tail end command suffer from either erratic or no water supplies. Moreover, ground water availability in the irrigation command varies in quantity and quality both in time and space and nearly 60 per cent of ground water is having saline/alkali waters in different magnitudes (Anonymous, 1994). Development of technologies for efficient and safer utilization of poor quality water for crop production is one of the thrust areas for research, as the share of water allocation to agriculture is anticipated to reduce by 10-15 per cent. Recent advances in irrigation technique involving efficient use of water through micro irrigation holds key to enhance the total crop production and improve the economy of the farmers of the tail end irrigation commands. Several researchers reported that by adopting drip irrigation, higher crop yields can be obtained along with considerable saving in irrigation water besides achieving higher water production efficiency (Cetin and Bilgel, 2002; Tiwari *et al.*, 2003).

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