

Effect of micro-irrigation systems and fertilizer levels on growth and yield of green chilli (*Capsicum annuum*)

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■ **ABSTRACT** : A field experiment was conducted at A.I.C.R.P. on Water Management Dapoli Centre in lateritic soils of Konkan region of Maharashtra during the year 2007 to 2010, to study the effect of micro-irrigation methods and fertilizer levels on growth and yield of green chilli. The experiment was laid out in Factorial Randomized Block Design with nine treatments and three replications. The results revealed that, the growth parameters showed non significant effect with imposed irrigation treatments. In case of yield, the micro sprinkler irrigation at 100 per cent PE with 100 per cent recommended dose of fertilizer (150:50:50 NPK) recorded maximum green chilli yield of 118.23 q-ha⁻¹ as compared to all other treatments. The effect of irrigation levels was found to be significant and maximum yield (132.32 q-ha⁻¹) of chilli was reported in I₁ treatment, whereas minimum yield (90.6 q ha⁻¹) was reported in I₃ treatment. The fertilizer levels also showed significant results with maximum yield of 116.7 q ha⁻¹ under F₁ treatment and minimum yield of 104.72 q-ha⁻¹ in F₃ treatment. The water use efficiency ranged between 62 kg ha-cm⁻¹ to 272 kg ha-cm⁻¹. Higher water use efficiency (272 kg ha-cm⁻¹) was found with micro sprinkler at 100 per cent PE with recommended dose of fertilizers. The B:C ratio was 3.06 in micro-sprinkler at 100 per cent PE with 100 per cent recommended dose of fertilizers. This indicates that, micro-sprinkler irrigation is superior for growing chilli in lateritic soils of Konkan region of Maharashtra.

■ **KEY WORDS** : Chilli, Micro-irrigation methods, Growth and yield, Water use efficiency, Fertilizer use efficiency

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The total area under irrigation in Maharashtra state is only 18.5 per cent and it is estimated that after full development of water resources the irrigated area in the state may not exceed 30 per cent with the adoption of conventional surface irrigation methods. Bringing more area under irrigation will largely depend on the efficiency of water use. In this context, micro-irrigation has to play a very significant role to achieve not only higher productivity and water use efficiency but also have sustainability. The micro-irrigation system keeps the soil moisture near to field capacity and this system also increases fertilizer use efficiency after avoiding losses through leaching, volatilization and fixing of nutrient in the soil (Nakayama and Bucks, 1986). Micro-irrigation is the major component in adoption of precision agriculture. Maharashtra has largest area under micro-irrigation. The work carried out by Shinde *et al.* (2004) on effect of micro-irrigation system and nitrogen levels on growth

and yield of chilli under lateritic soils of Konkan region shows that, the micro jet irrigation supplemented with 100 kg N ha⁻¹ could be used for nitrogen saving, higher water use efficiency and higher green chilli yield. Also the work carried out by Muralikrishnasamy *et al.* (2008) on drip irrigation and fertigation in chillies showed that, drip irrigation at 50 per cent PE along with fertigation of recommended level of N and K resulted in higher yield and water saving compared with surface irrigation. A very meagre work has been carried on micro-irrigation under lateritic soils of Konkan region of Maharashtra.

Chilli is an important vegetable cum condiment. It is called as red pepper/hot pepper. A number of varieties are grown for vegetables, spices, condiments, sauce and pickles. Chilli is source of vitamins, especially in vitamins A and C. It has many medicinal properties. India produces about 1.3 million tones of chillies from an area of 0.806 million hectares with an average productivity of 16.11 t ha⁻¹. India contributes one