ENGINEERING AND TECHNOLOGY IN INDIA
Volume 2 Issue (1&2); (April & October, 2011); Page : 54-57

A CASE STUDY

*Received:* May, 2011; *Accepted :* Aug., 2011

# Studies on irrigation efficiencies with different drip systems and their economic analysis for bitter gourd (*Momordica chanrantia* L.)

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## ABSTRACT

A field experiment was carried out to study the irrigation efficiencies with different drip systems and their economic analysis for bitter gourd under semi arid conditions of Raichur during *Rabi*/summer 2009-10. The different drip irrigation levels included $T_1$ - 60 % ET, $T_2$ - 80 % ET, $T_3$ - 100% ET, $T_4$ - 120 % ET and $T_5$ – furrow irrigation (control). The results of the study indicated that 80 and 100 per cent ET level with drip irrigation exhibited superior values for different irrigation efficiencies when compared to other drip irrigation levels and furrow irrigation. All the drip irrigation treatments recorded higher benefit: cost ratio (2.64 to 3.86) except 60 per cent ET level (0.94) as compared with furrow irrigation (2.13).

Devaranavadgi, S.Vivek, Shirahatti, S.S. and Patil, M.G. (2011). Studies on irrigation efficiencies with diffrent drip systems and their ecomic analysis for bitter gourd (*Momordica chanrantia*. L.). *Engg. & Tech. in India,* **2** (1&2) : 54 -57 .

**Key words :** Bitter gourd, Drip irrigation, Irrigation efficiency, Economic studies

## INTRODUCTION

Drip irrigation is gaining importance in the world, especially in areas with limited and expensive water supplies, since it allows limited resources to be utilized more judiciously. Drip irrigation is the method of slow and frequent application of water approximately equal to the consumptive needs of the plants. Filtered water is distributed under low pressure by means of emitters on or in the soil. In drip irrigation, low discharge of water is applied more frequently close to the plant through suitably spaced drippers. In that case, part of the soil in the vicinity of plant roots is wetted and kept close to field capacity. Physically these systems are adoptable to wide range of soil topography and crops. This method not only ensures highest economy in water utility, reduced evaporation and seepage losses, but also provides ideal moisture regimes for high yields in many crops.

Bitter gourd (*Momordica chanrantia* L.) is a member of the Cucurbitaceous family. It is widely grown in China and India and throughout Southeast Asia. The widely spaced crops and vegetables have been found to be feasible for their economic and biological returns considering high initial costs incurred in drip irrigation systems. Also the irrigation efficiency factors need to be verified while choosing a suitable drip irrigation system.

## MATERIALS AND METHODS

A field experiment was carried out at Main Agricultural Research Station, Raichur during *Rabi*/ summer 2009-10. The experiment was laid out in a randomized block design with 5 treatments ($T_1$ - 60 % ET, $T_2$ - 80 % ET, $T_3$ - 100 ET, $T_4$ - 120 % ET, $T_5$ - Control treatment) and 4 replications. The climate of the site is typical semi arid environment with an average rainfall of 722 mm per anum. The soils are black sandy loam representing a major soil type of the region. The application efficiency, distribution efficiency and water use efficiency for drip and furrow irrigation were computed and

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