

## Study of hydraulic performance of drip irrigation systems in Banana fields of Guntur district

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Received : 23.11.2011; Revised : 25.12.2012; Accepted : 13.02.2012

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■ **Abstract** : Andhra Pradesh state in India has pioneered in installing drip irrigation systems in farmers' fields through government subsidy schemes. State government, though established centers for certifying the efficiencies of systems installed for payment to the micro irrigation companies, farmers face many maintenance functional problems in their field while irrigating through drip. The authors strongly feel that the system design accuracy play a vital role in terms of energy saving, long life of pipe material and equipment. Farmers' satisfaction is also of paramount importance and the system performance and post maintenance aspects should be felt as research component too. Hence, 40 farmers growing banana crop were identified from Guntur district of Andhra Pradesh state, whose fields were installed with drip system by various micro irrigation companies. The hydraulic parameters selected for the study are back calculation of HP requirement of pump set, pressure and discharge variations. Around 31 installations show that the pumps need to be upgraded for the discharge and pressure. If the same applied at national scale one can easily comprehend the loss of huge government investments allocated to benefit the farming community, importance of accurate design and installations for the drip irrigation systems.

■ **Key words** : Drip irrigation system, Total head loss, Discharge variation

■ **How to cite this paper** : Murali Krishna, CH, Hema Kumar, H.V. and Rao, D. Sai Gangadhara (2012). Study of hydraulic performance of drip irrigation systems in banana fields of Guntur district. *Internat. J. Agric. Engg.*, 5(1) : 58-61.

Water is the precious natural resource, a basic human need and a prime national asset. The extent to which the water is plentiful or scarce, clean or polluted, beneficial or destructive, profoundly influence the extent and quality of human life. The relentless increase in population and the resulting spurt in the demand for water require careful planning and management of the limited water resources. The available water resources are to be optimally harnessed and beneficially utilized with appropriate priorities of use. Drip irrigation is also known as trickle irrigation or micro irrigation, which minimizes the use of water and fertilizer by delivering water slowly near the root zone or directly in to the root zone of plants, through a net work system of prime movers, filters, valves, pipes, tubing and emitters. The major crop cultivated in the study area is as it is an acclimatized one and also has market in the region with high returns.

The procedure to evaluate head losses in drip laterals, based on constant outlet, discharge has been proposed (Domienico *et al.*, 2006). It is also demonstrated that in India drip irrigation is found performing better than basin irrigation

in all aspects of growth, yields of banana, and in water use efficiency (Srinivas and Hedge, 1989). The results of his work stated that the productivity has increased by 51 per cent and water saving is about 44.8 per cent. Losses in drip irrigation lines. Total head losses values are measured on 15 commercially available co-extruded laterals were compared with those obtained by using the newly proposed methodology. Relative errors on the pressure head estimation for the examined cases were always  $\pm 2.4$  per cent. It was found that the pressure requires to operate the farthest dripper ranges between 3 to 7m with respect to length of lateral

### METHODOLOGY

#### Study area:

As part of this study and performance evaluation of drip irrigation systems in some of the villages in Mangalagiri and Thulluru mandals of Guntur district, the data collected from various organizations like Andhra Pradesh Micro Irrigation Project (APMIP) office, Micro Irrigation(MI)