



Effect of drip irrigation system on water and fertilizer use efficiency for okra cultivation

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Abstract : A comparative study was conducted to evaluate the performance of drip and check basin irrigation system in okra. Okra yield was found significantly higher in drip irrigation treatment (double drip line between three plants rows). It was found that drip irrigation gave 34.60 per cent higher yield than the yield obtained with check basin irrigation system. Drip irrigation saved 44.65 per cent water and 46.66 per cent fertilizer consumption. The water and fertilizer use efficiencies were undoubtedly higher in the drip irrigation than that of traditional method of irrigation.

Key Words : Drip irrigation, Check basin irrigation, Water use efficiency

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INTRODUCTION

Okra [*Abelmoschus esculentus* (L.) Moench] is an economically important vegetable crop grown in tropical and sub-tropical parts of the world. India ranks first in the world with 5.784 million tons (70% of the total world production) of okra produced from over 0.49 million ha land (Indian Horticulture Data Base- 2011). Adjustment of climatic factors helps in taking at least one (summer) crop in hills, 2 or even 3 (summer, *Kharif* and late *Kharif*) crops in the east, west and north Indian plains and almost year-round cultivation under moderate climate in south India. The production and productivity of okra is quite low. Therefore, it is imperative to adopt improved varieties, improved method of water and fertilizer application to boost okra production. Water and fertilizer application at right time with quantity are main important factor plays a vital role in productivity of okra. This can be achieved only by introducing advance irrigation method like drip or fertigation.

Generally, check basin method of irrigation is used for irrigating the vegetable crops in arid and semi arid region, where about 40 per cent of water is lost in storage and conveyance (Srinivas, 2006). In other hand drip irrigation is

an efficient method in which water is supplied directly to root zone of the plant so as to maintain near the field capacity of soil for most of the time. Water is applied frequently to the soil through drippers attached to water delivery lateral lines placed near the plants row. The principal of drip irrigation is to irrigate the root zone of the plants to get minimal wetted soil surface. Very high water application efficiency (90-95%) can be obtained through drip irrigation method (Hasan *et al.*, 2008).

The drip irrigation system becomes more efficient and effective when fertilizer is applied through irrigation system known as fertigation and become a common technique in irrigated agriculture. In conventional method of fertilizer application fertilizers are normally used as a basal and top dressing and the whole quantity is applied in one to three doses, because these fertilizers are applied in bulk. Major quantity of applied fertilizer go waste due to leaching, denitification, volatilization and its fixation in the soil. Moreover these fertilizers also get transmitted to reason beyond the active and thereby remain no longer useful to the plants. The effective utilization by the plants in many cases is less than 50 per cent of the fertilizer application (Yadav *et al.*, 2009). In fertigation application is made directly to the plants roots, in split form, uniformly matching the plant water use to avoid leaching and