

Research Paper :

Effect of modified intercultural CAET-hand tools on onion crop under trickle irrigation system

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ABSTRACT

Increasing economic of water productivity which is crucial for sustainable agriculture production and its becomes vital in the areas of water scarcity. Adoption of trickle irrigation system and modified intercultural tools facilitate this to great extent. An attempt has been made to evaluate the response of trickle irrigation and modified intercultural tools on growth and yield of onion at CAET-farm Etawah. The overall efficiency of intercultural operations with traditional tools was considerable low as compared to intercultural practices done through CAET-modified hand tools and hoe, under trickle irrigation system. Labour and water saving was also observed upto 25 to 35% and 40 to 60 %, respectively while utilizing modified CAET-hand tools and trickle irrigation system. Height of plant was also observed 26.5% more and net return was found maximum of Rs. 66,422 per hectare and benefit cost ratio was also found 3.62:1 rather than traditional farming system of onion crop.

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This study revealed that the designed of two intercultural tools, named CAET hand tool and hoe under the recommended doze of fertigation with traditional and trickle method of irrigation at CAET farm Etawah, U.P. Trickle irrigation provides an efficient method for fertilizer delivery and allows precise timing and uniform distribution of applied nutrients. Fertilizer application through trickle irrigation can reduce fertilizer used and minimize ground water pollution due to overdose of fertilizer leaching from excessive irrigation. Fertigation events can be scheduled as often as irrigation, upto several times per season. Optimum fertigation interval for drip irrigated crops in general and for onion in particular, is meagre. Rajput and Patel, 2002 worked on response of drip irrigation system on yield of different vegetable crops as well as onion crop and found maximum yield and growth of onion crop under drip system of irrigation. Ali (2004) reported that benefit cost ratio was higher under different nutrients management practices of marigold cultivation. Kumar *et al.* (2008) also worked on yield and net return of onion crop under different level of irrigation using drip irrigation system and found maximum yield and net return while using drip irrigation system. Sivanappan and Dixit, 1994 carried out experiment on water requirement and response of chilli crop under drip

system and found 62% of water saving and 25% increase in yield using drip system of irrigation. Kataria and Michael (1990) conducted field trials as response of vegetable crop, dynamic of soil moisture and nitrogen in grop root zone to drip and furrow method of irrigation on tomato crop. They observed an increase of crop yield by 52.5% and 42.3%, respectively under drip irrigated plot over the furrow irrigated plots with the identical amounts of water supply.

METHODOLOGY

This chapter deals about the methodology of the experiment with the response and economics of onion cultivation by utilizing various modified intercultural hand tools with constant level of fertigation and irrigation through trickle irrigation system and compared with traditional farming of onion cultivation. The present study was based on the following objectives:

- Response and economics of onion cultivation under trickle system of irrigation with constant level of fertigation and irrigation, compared with traditional farming system.
- Study of the intercultural practices with newly fabricated manually operated hand tools.
- Development of the relationship of net return and