

Research Paper :

Response of onion (*Allium cepa* L.) to irrigation schedules and nitrogen levels under micro-irrigation system

G.B. YADAV, U.M. KHODKE AND S.B. JADHAV

Accepted : January, 2010

See end of the article for authors' affiliations

Correspondence to:

G.B. YADAV

Department of Soil and Water Conservation Engineering, College of Agricultural Engineering and Technology, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

ABSTRACT

An experiment was conducted at College of Agricultural Engineering and Technology, MAU, Parbhani to assess the response of onion under different irrigation schedule and nitrogen levels under micro irrigation system. In the present investigation onion variety N-53 was tested for exploiting its maximum yield potential under four irrigation schedules namely I₁ (0.75 Etc), I₂ (1.00 Etc), I₃ (1.25 Etc) and I₄ (conventional check basin) and three nitrogen levels namely N₁ (75 % RDF of N), N₂ (100 % RDF of N) and N₃ (125 % RDF of N). The performance of drip irrigation system was judged by uniformity of distribution and emission uniformity. The water use efficiency and fertilizer use efficiency was also studied. The average emission uniformity coefficient of drip irrigation system was 95.07 per cent. The highest yield of onion bulb was obtained in the plots with drip irrigation method scheduled at 1.25 Etc mm depth and 100 per cent recommended dose of nitrogen.

Key words : Irrigation scheduling, Micro irrigation, Emission uniformity, Yield of onion

As the water is scarce, it is essential to use it more efficiently by the way of adopting proper scheduling and water saving method such as micro irrigation methods for fetching higher yields and water use efficiency. Onion (*Allium Cepa* L.) is an important vegetable cash crop in India. India has largest area under onion in the world. Onion is an important and indispensable item in every kitchen as condiment and vegetable. Onion is used either in salad or as condiment for cooking with other vegetables. It has good medicinal value. It's major value lies in it's flavour. Onion is most sensitive to irrigation. Onion has a relatively shallow root zone and hence requires more frequent irrigations as compared to other vegetable crops. Under such circumstances, drip irrigation is a promising technology by which water is conveyed under pressure through a pipe to a relatively closely spaced grid of outlets and discharging the water through these outlets at virtually zero pressure (Chopde and Bansode, 1995). The application of fertilizers through drip irrigation system is relatively a new practice in India (Maher, 1991). Keeping all above points in mind, the field experiment was planned, to determine appropriate irrigation schedule for onion under drip irrigation system, to assess the response of onion under different nitrogen level.

METHODOLOGY

The experiment was conducted at College of Agril. Engg. and Technolgy, MAU, Parbhani to study the

response of onion (variety N-53) under different irrigation schedule and fertilizer levels under micro irrigation system.

Experimental details	
a	Onion
b	Botanical name <i>Allium cepa</i> L.
c	Variety N-53
d	Experimental design Split plot
e	Number of replications Three
f	Number of treatments Twelve
g	Number of plots 36
h	Plot size 3 x 4.5 m
I	Crop spacing 10 x 15 cm
j	Seed rate 10 kg ha ⁻¹
k	Fertilizer dose 100:50:50 as N:P:K

Details of treatments:

Treatments constituted the combination of four irrigation schedules and three nitrogen levels) Main treatments

- I₁ - Irrigation at 0.75 ETC through micro irrigation.
- I₂ - Irrigation at 1.00 ETC through micro irrigation.
- I₃ - Irrigation at 1.25 ETC through micro irrigation
- I₄ - Surface irrigation (conventional check basin).

B) Sub treatments

- N₁ - 75% recommended dose of N.
- N₂ - 100% recommended dose of N.
- N₃ - 125% recommended dose of N.