

## Response of cauliflower to irrigation schedules and fertilizer levels under drip irrigation

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■ **Abstract** : The present investigation was conducted during *Rabi* season of December 2008 to March 2009 at the farm of Irrigation and Drainage Engineering, Marathwada Agricultural University, Parbhani. The experimental design was split plot with drip irrigation schedules as main treatments and fertigation levels as sub treatments. The treatments were also compared with control. (Conventional application of water and fertilizer). The gross as well as net plot size was 4.8m x 3.6m and 4.2m x 3.0m, respectively. The plant to plant and row to row spacing was 60cm x 60cm. Drip Irrigation schedules comprised of  $I_1$  (0.4 CPE),  $I_2$  (0.6 CPE),  $I_3$  (0.8 CPE) and fertigation levels included  $F_1$  (50 per cent RDF),  $F_2$  (75% RDF) and  $F_3$  (100 %RDF). The control  $I_4$  was furrow irrigation scheduled at 1.2 IW/CPW with 60 mm depth of irrigation. Thus ten treatment combinations were studied with three replications. The drip irrigation ( $I_1$ ,  $I_2$  and  $I_3$ ) was scheduled at an alternate day as desired by the treatments and depending on pan evaporation. For control ( $I_4$ ) furrow irrigation was 60 mm depth of water was applied when CPE reached to 60 mm (IW/CPW ratio of 1.2). The fertilizer dose of N: P: K (120:60:60 kg/ha) was considered for the irrigated cauliflower. The fertilizers were applied in splits through irrigation water in drip irrigated plots through venturi while in surface irrigated plots whereas they were conventionally applied in soil by ring placement. Combination fertilizer of grade of 19:19:19, MOP, SSP and urea were used as source. The study revealed that percentage of average water saving under drip irrigation system over surface irrigation was 43.45 per cent and it was 75.54 per cent, 63.87 per cent and 50.95 per cent under  $I_1$ ,  $I_2$  and  $I_3$  irrigation schedules, respectively. The mean water use efficiencies under surface irrigation and irrigation schedules were 22.03 kg/ha-mm and 73.48 kg/ha-mm, respectively. Under drip irrigation system, higher water use efficiency was recorded at  $I_1$  (92.67 kg/ha-mm),  $I_2$  (73.88kg/ha-mm) and  $I_3$  (58.57kg/ha-mm).

■ **Key words** : Cauliflower, Fertilizer, Drip irrigation

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**W**ater and nutrient are the basic need of any crop. Cauliflower one of the most important vegetable crops, requires the ample quantity of water and fertilizer than other crops. Nevertheless water scarcity and high input cost of fertilizer are the major constraints in increasing the area, production and productivity of cauliflower crop. In order to get rid of these constraints irrigation with fertigation through drip is the most suitable option, which can save water and fertilizer in addition to increase in the area along with increasing productivity. Besides that, this method provides many other associated benefits like saving in pesticides and labour. Lot of work has been done on drip irrigation, including yield response and irrigation scheduling. However, the research on scheduling of fertilizer through

fertigation and evaluation of drip system performance under fertigation is scanty.

The field experiment entitled response of cauliflower to irrigation schedule and fertilizer levels under drip irrigation was conducted during *Rabi* season of December 2008 to March 2009 at the farm of Irrigation and Drainage Engineering, Marathwada Agricultural University, Parbhani with objectives to assess the growth and yield response of cauliflower to fertilizer level under drip irrigation and compare the impact of irrigation scheduling and fertilizer level on water use efficiency for cauliflower.

### ■ METHODOLOGY

Cauliflower is one of the most important vegetable crops