

Evaluation of cauliflower under furrow and micro sprinkler irrigation

R.D. BANSOD

Correspondence to :
R.D. Bansod
Department of Soil and Water
Conservation Engineering,
Dr. A.S.College of Ag. & Engg.,
Rahuri, AHMEDNAGAR
(M.S.) INDIA

Accepted : February, 2007

ABSTRACT

The field experiment was conducted at G.B.P.A.U. and T., Pantnagar to study the comparative effect of furrow and microsprinkler irrigation on biometric development and yield components of cauliflower. The plant height recorded in surface irrigation (FI) and microsprinkler irrigation (MI) was 42.6 and 53.1 cm., respectively. The number of leaves recorded in FI and MI were 12.88 and 16.25 and the duration of curd initiation 78 and 73, respectively. The yield of cauliflower was 31.7 and 25.51 tonne/ha in MI and FI respectively with an increase of 24.31 % in MI over FI. The diameter, weight and volume of curd were also higher in MI than SI. Water use efficiency obtained in MI and FI were 1.43 and 0.79 tonne/ha-cm., respectively. Water saving, 31.2% over FI, was recorded in MI.

Key words : Cauliflower, Furrow, Microsprinkla, Biometrec growth parameters.

Effective use of available water resources with controlled irrigation is hardly possible with traditional irrigation methods, however, these difficulties can be overcome with the adoption of microirrigation. Maintaining available soil moisture at low water tension and almost constant during entire growth period through microirrigation with considerable water saving, up to 50 per cent, was possible with microirrigation (Patel *et al.*, 2006). Microsprinkler irrigation is one of the microirrigation system which apply water to crops at lower rate than the conventional type of sprinkler irrigation system, in a similar manner to that of rainfall, at a pressure ranging from 1.5 to 2.0 kg/cm². The various scientists have claimed its superiority over traditional methods in terms of better crop growth and higher yields for different types of close growing crops. Its response to the cauliflower, as not studied yet in detail, needs to be determined experimentally for obtaining the information to enable the irrigator for effective planning of available scarce water resources.

MATERIALS AND METHODS

The field experiment was conducted in G.B.P.U.A. and T., Pantnagar, Uttaranchal during September 2002 to February 2003 to study the comparative effects of microsprinkler and surface irrigation on biometric growth parameters and yield components of cauliflower (*Brassica oleracea*), cv. Pusa Snowball K-1. The treatments were based on the microsprinkler and furrow irrigation. In case of microsprinkler irrigation, the microsprinklers were provided at a grid of 5m.

Irrigation scheduling

The water quantity to be applied after three days was calculated by the following formula.

$$V = P \times Pf \times Kc \times Sm \times Sl$$

Where,

V = quantity of water to be applied (litres)

P = Pan evaporation, mm for three days

Pf = Pan factor, 0.75

Kc = Crop factor

Sm = Spacing between microsprinkler (m)

Sl = Spacing between laterals (m)

The crop factors were determined by the method suggested by Doorenbos and Pruitt (1977).

The depth of water applied through furrow irrigation was calculated by the following formula.

$$D = (FC - PWP) \times B.D. \times D \times MAD$$

Where,

D = Depth of water to be applied (cm)

FC = Field capacity (per cent)

PWP = Permanent wilting point (per cent)

B.D. = Bulk density, gm/cm³

D = Effective crop root zone depth (m)

MAD = Maximum allowable deficit.

The measured quantity of water was applied with the Parshall flume.

RESULTS AND DISCUSSION

The biometric growth and yield parameters such as height of cauliflower, number of leaves, days to curd initiation, curd weight, curd diameter, curd volume and