



## Research Paper

### Article history :

Received : 24.08.2012

Revised : 22.02.2013

Accepted : 10.03.2013

# Effect of different methods of irrigation and moisture regimes on yield and water economy in cabbage (*Brassica oleracea* L. var. capitata)

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**ABSTRACT :** Field experiments were conducted for two years during 2000-2002 under NATP project at JNKVV Jabalpur. Six treatments consisting of irrigation with furrow method (IFM) at 50% available soil moisture (ASM), IFM at 60% (ASM), drip irrigation (DI) @ 8 lph (liter per hour) at 50% ASM, DI @ 4 lph at 50% ASM, DI @ 8 lph at 60% ASM, DI @ 4 lph at 60% ASM were laid in randomized block design with four replications. The findings showed that drip irrigation @ 4 lph at 60% ASM had 82.36% and 14.42% higher yield over furrow method of irrigation and drip irrigation @ 4 lph at 50% ASM, respectively. In addition it also had 31.03% saving of water and 164.64% more water use efficiency than irrigation with furrow method.

**KEY WORDS :** Cabbage, Drip irrigation, Moisture regimes, Yield, Water use efficiency

**HOW TO CITE THIS ARTICLE :** Kushwah, S.S. and Dwivedi, Y.C. (2013). Effect of different methods of irrigation and moisture regimes on yield and water economy in cabbage (*Brassica oleracea* L. var. capitata), *Asian J. Hort.*, 8(1) : 43-45.

Cabbage is an important vegetable crop mainly grown in winter season in plains of India. Optimal management of land and water is essential not only for sustainable development but also for human survival. Lack of water rather than land may become the principal constraints to increase the food production in future. As the cabbage is succulent and leafy, its water requirement is high as larger quantity of water is consumed in the process of transpiration. In addition, a considerable volume of water is lost by evaporation from the soil surface in cropped area especially when the crop is still young (Som *et al.*, 1976). Generally, furrow/check basin method of irrigation is followed for cultivation of cabbage, which has a drawback of percolation and evaporation losses of water. A considerable portion (10-15%) of land is also wasted in bunds and channels in this method of irrigation. Drip irrigation is a relatively new technology, which has proved its superiority over other conventional methods of irrigation. In this method of irrigation water is delivered near the plant root zone in a precise quantity with an objective to maintain soil moisture content close to field capacity. Drip irrigation also increases the uptake of plant

nutrients (Deolankar *et al.*, 2004). Increase in yield and saving of water with drip irrigation over furrow method has been reported by earlier workers (Sharanappa and Gowda, 1995; Srivastava and Chauhan, 1999). Keeping these points in view, investigations were carried out to evaluate the response of cabbage to different moisture regimes with furrow as well as drip irrigation methods.

## RESEARCH METHODS

Field experiments were conducted for two years during 2000-2002 under NATP project at Jawaharlal Nehru Krishi Viswavidyalaya, Jabalpur. Six treatments consisting of irrigation with furrow method (IFM) at 50% available soil moisture (ASM), IFM at 60% (ASM), drip irrigation (DI) @ 8 lph (liter per hour) at 50% ASM, DI @ 4 lph at 50% ASM, DI @ 8 lph at 60% ASM, DI @ 4 lph at 60% ASM were laid in randomized block design with four replications. The soil of the experimental field was characterized as clay loam in texture having field capacity 23.6% weight basis ( $\theta_w$ ), wilting point 12.1% on weight basis ( $\theta_w$ ), bulk density 1.45 Mg m<sup>-3</sup>. About forty days old seedlings of cabbage variety Pride of India