Effect of trickle irrigated Broccoli on different irrigation and fertigation levels

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Abstract:

The various reviewers pointed that the crucial characteristics of broccoli under various drip irrigation and fertigation levels. The various reviewers result revealed that crop yield of broccoli was irrigated at 150 % E\textsubscript{P} replenishment; however which resulted higher benefit cost ratio. Result showed that applied irrigation in terms of (IW/CPE) ratio from 0.4 to 0.8 and given fertilizer at 25 % as basal and 75 % through trickle fertigation significantly increased the broccoli curd yield and NPK uptake. Optimum production in broccoli with irrigation level of 80 % of ET\textsubscript{c} represented that there is no available water scarcity for crop water requirement and which are at par with treatment100 % of ET\textsubscript{c}.

INTRODUCTION

An availability of water in different sector like as industrial, urban and agricultural sectors creates the utility of water in vegetable production the universe. Optimum water resources for irrigation are through crop productivity. The trickle irrigation may contribute significant to the more used for irrigation in agriculture and enriching irrigation water use efficiency (Sezen \textit{et al.}, 2006). The ingestion of has been gradually upscale in the last ten year duration and effectively focused on health enriching characteristics of broccoli. The broccoli biological parameters grown under nitrogen supply limitations and irrigation delivery are a influencing factor for its productivity and quality attributes. (Vagen \textit{et al.}, 2004). Stivers \textit{et al.} (1993) pointed that N upscale in broccoli varies from 150– 280 kg.ha\textsuperscript{-1}. The frequently recommended fertilizer has often available the technical literature (Bar-Yosef and Sagiv, 1982). However, very fewer studies have represented a profitable use in frequent or continuous fertigation compared to less frequent fertigation. Bar-Yosef and Sagiv (1982) reported that regular fertigation for tomatoes (\textit{Lycopersicum esculentum} L.) through surface trickle-irrigated with proportion of 100 to 200 mg N per liter in the applied irrigation water. However, this result revealed that in nitrogen applications in excess of 1000 kg N/ha, far better than the N uptake by the plants, and may have resulted in abundant leaching losses of NO\textsubscript{3} below the root zone. The daily irrigation scheduling which determines how to irrigate and when to irrigate and amount of irrigation water is required by many factors but climate change plays the most important role. Large amount of studies have been carried out on the improvement and analysis of irrigation scheduling techniques (Johnson \textit{et al.} 1970). The pan evaporation replenishment and the ratio between IW/CPE ratios etc. for irrigation scheduling were used by many researchers and farmers (Prihar \textit{et al.} 1974).
Review of Literature

The crucial review on Broccoli (Brassica oleracea var. L. italica) undertaking study on fertigation and various irrigation levels were revelled following reviewers.

Lordwin J., 2008., Result revealed that irrigation at 150 % of EP replenishment gave a significantly superior producible yield of primary and secondary flowers of broccoli but irrigation water use efficiency was higher when crop was irrigated at 150 % EP replenishment.

Sanchita Bharam., Phookan., and Kachari M., (2010) Review revelled that drip irrigation fulfilment at 100 % ET0 replenishment with percent supportive of recommended dose of nitrogen (200 kg.ha⁻¹) through trickle fertigation was obtained to be significantly higher in terms of growth, production and cost analysis of broccoli in compare to the traditional fertilization with standard decided dose of nitrogen. Therefore, it can be concluded that fertigation with the present recommended dose of N (200 kg/ha) at 4 days frequency corresponding to 21 trickle can be practiced for commercial cultivation of broccoli (1:4.41) under the climatic condition of Jorhat (Assam).

Tolga Erdeam, et al., 2010, Review pointed out that N use efficiency resulted as 13.08 to 22.46 % and 37.12 to 73.13 % for autumn and spring season, respectively. Thomas L, et al., 2014, Result highlighted that productivity of broccoli was upscale fewer with N application of 268 lb/acre compared to 176 lb/acre. However, the parameters like head diameter, nor petiole N proportions and production of broccoli affected significantly for application of fertigation.

Ayas, 2011, results revealed that application of irrigation water ranged from 70 to 522 mm, and water ingestion ranged from 88 to 542 mm. The significant effect of irrigation water level was found on the head height, head weight, head diameter, yield and dry matter of broccoli. The maximum yield was obtained 29.2 t.ha⁻¹. Crop coefficient factor (ky) was found as 1.04. The maximum values for WUE and IWUE were found to be 6.71 and 6.50 kg m⁻³ for the K2cp treatment. Under the conditions that water resources are scarce, it can be recommended that K2cp treatment is most appropriate as a water application level for broccoli irrigation by trickle irrigation.

Himanshu S. 2013 review result revealed that irrigation at 150% of EP replenishment resulted in higher producible yield different stages of flowers of broccoli, but irrigation production efficiency was higher at 50% of EP replenishment. The drip irrigation method resulted in slightly higher producible yield and irrigation production efficiency of broccoli as compared with micro-sprinkler irrigation method, but surface irrigation method gave considerably lower marketable yield and water use efficiency. Irrigation at 150% of EP replenishment gave benefit cost ratio, net return and higher gross return.

Juvaria Jeelani., (2017) concluded that, increasing the trickle irrigation application IW/CPE ratio from 0.4 to 0.8 and application of fertilizer at 25 % as basal and 75 % through trickle fertigation significantly increased the curd yield and NPK uptake.
Poonam Chand (2017) reported that application of irrigation regimes through 0.8 I significantly increased biometric attributes (no. of leaves, plant height, leaf area etc.), yield attributes (diameter of head, volume of head, weight of main head and secondary head, per hectare and biological yield and total head yield per bed etc).

Arti Kumari et al., 2018, revealed that optimum production in broccoli with irrigation level of 80 % of ETc represented that there is no available water scarcity for crop water requirement and which are at par with treatment 100 % of ETc.

References:


Thomas L. Thompson, Scott A. White, James Walworth, and Greg Sower (2014) Fertigation frequency effects on yield and quality of subsurface drip irrigated Broccoli.
