

Effect of Different Combinations of Soluble NPK Fertilizers Through Drip Irrigation on the Yield Contributing Characters, Yield, and Quality of Tomato (*Lycopersicon esculentum mill.*)

J. R. KADAM* AND S. KARTHIKEYAN

Department of Agril. Chem. & Soil Science, IFD-IWM, M.P.K.V., Rahuri - 413 722 (M.S.) INDIA

(Accepted : October, 2005)

SUMMARY

An experiment was conducted at Mahatma Phule Krishi Vidyapeeth, Rahuri (M. S.) during the year 1998-99 to study the yield contributing characters, yield & quality parameters as influenced by fertigation to tomato cv. Dhanshree. The field experiment was laid out in a 8 different treatments. The fertilizer grades used were 13:5:26, 13:40:13, 19:6:6 and 6:12:36. The yield contributing characters viz, number of fruits and weight of fruits per plant were maximum in T₄ treatment (100% recommended NPK through drip). However, it was on par with the treatments T₂ (100% recommended NPK as soil applied + Drip irrigations and T₅ treatment (70% N and 80% P and K fertigated through drip). The yield contributing characters are minimum in treatments T₈ (50% N and 70% P and K fertigated through drip) but it was on par with treatment T₇ (50% N and 80% P and K fertigated through drip). The treatment T₄ produced more dry matter per plant which was significantly higher than surface irrigated plot (T₁) and other treatments except T₅ which was on par with T₄. The maximum yield of tomato 47.1 t/ha was obtained in treatment T₄ followed by T₅ (41.7 t/ha). The statistically these treatments were on par with each other with respect to yield. The increase in yield by drip method with different fertilizer levels due to treatment T₂, T₃, T₄, T₅ and T₆ was found to be 19.2, 4.2, 40.0, 24.1 and 5.9 per cent over surface irrigation respectively. The quality parameters such as pH and TSS and Lycopene content at 100 per cent recommended NPK level from liquid fertilizer through drip irrigation were superior to solid further plus surface irrigation while the reverse trend was observed in case of acidity.

Key words: Soluble fertilizers, Drip irrigation, Quality.

Tomato is an important vegetable crops and it has high nutritive value, being a good source of vitamins A and B and an excellent source of vitamin C. Water and fertilizers are an important factors for increasing the crop production and being limited, its efficient use is basic for the survival of agriculture. Naturally further expansion of irrigation may depend upon the adoption of new systems such as pressure irrigation, either irrigation method etc. There is a need for minimising the loss of water through conveyance, run off and evaporation. Amongst sophisticated methods, drip irrigation has proved it's superiority due to direct application of water and furth and (liquid) in the vicinity of root zone. Under drip irrigation, the spatial distribution of soil moisture and consequently crop roots is restricted to a small volume of soil directly below the emitters such a restriction has important implications for optimum fertilizer placement. Tomato requires heavy supply of plant nutrient especially N, P and K fertilizer for getting good yield. The N, P and K nutrients have been observed to influence the quality of tomato fruits. Quality factors like total soluble solids, titrable acidity, colour of fruits and ascorbic acid increased with N nutrient (Patil and Bojappa, 1984). Several studies have indicated that conventional methods of fertilizer application needs to be modified in order to take full advantage of drip irrigation system Miller *et al.*, (1976). Pawar *et al.*, (1992); reported that 100 per cent N and P application as liquid

fertilizer through drip irrigation increases the yield contributing characters and increase in the garlic bulb yield. However, very meagre information is available regarding the use of different combinations of liquid NPK fertilizer through drip irrigation for crop production. Hence the present investigation was undertaken to study the yield contributing characters, yield and quality as influenced by liquid fertilizer to tomato.

MATERIALS AND METHODS

A field experiment was conducted at Mahatma Phule Krishi Vidyapeeth, Rahuri during the year 1998-99. The soil was study clay loam pH 8.1, EC-0.21 dS/m bulk density 1.41 Mg/m³, field capacity 29.1 per cent, permanent wilting point 13.6 per cent, infiltration rate 9.8 mm/hr, Depth of soil was 30 cm. The experiment was laid out in a randomised block design with eight treatments. Cv. Dhanshree. The details of the treatments are as follows.

1. 100% recommended NPK as soil applied + Surface irrigation (T₁).
2. 100% recommended NPK as soil applied + Drip irrigation (T₂).
3. 100% recommended N through drip + P and K as soil applied. (T₃).
4. 100% recommended NPK through drip (T₄).
5. 70% N and 80% P and K fertigated through drip (T₅).

*Author for correspondence