



Effect of different fertigation levels on morpho-physiological characters and yield of capsicum under greenhouse condition

S.P. TIWARI*, HEMANT KUMAR PANIGRAHI, D. SHARMA,
R. AGRAWAL, N. AGRAWAL AND P. DUBEY

Precision Farming Development Centre, Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya,
RAIPUR (C.G.) INDIA

Abstract : The experiment was carried out at Precision Farming Development Centre (PFDC), Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during *Kharif* 2011-12. Experiment was conducted in RBD design comprising of four treatments viz., control, 60 per cent, 80 per cent and 100 per cent. fertigation levels under the polyhouse condition. Observations were taken plant height, stem girth, secondary branches, dry matter production, days to first flowering, days to first fruiting and fruit yield. Significantly maximum fruit yield per ha was obtained with T₃ (80% RDF) and minimum in control.

Key Words : Fertigation, Polyhouse, Dry matter accumulation, Flavour

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INTRODUCTION

Capsicum (*Capsicum annum* L.) is one of the important vegetables grown in India as well as in the world, because of its nutritive value, flavour and colour and is considered as one of the major commercial crops of the world. Different varieties are grown for vegetables, spices, condiments, sauces and pickles. The genus *Capsicum* consists of about 20 species and only four species are under cultivation. Capsicum is consumed as fresh, dried or processed form. The sweet pepper (*Capsicum annum* L.) is an annual plant belonging to the Solanaceae family. It is day-neutral plant. The root system is a highly branching, located upto the 20–30 cm soil layer. The regenerative capacity of the sweet pepper root system is low. The stem is herbaceous early in the growing season and lignified at the base by the time of fruit maturation.

Fertigation allows nutrient placement directly into root zone around the plants through a dripper network with the help of emitters near the consumptive use of plants during critical periods of nutrient requirement. Thereby, losses of water and nutrient can be minimized substantially as fertigation is economically feasible, socially and environmentally

acceptable. Fertilizers (water soluble) used for nitrogen, phosphorus and potas there were a significant difference in days to flowering, days to fruiting, number of branches per plant, plant height, number of fruits per plant, length and diameter of fruit and total yield (Nagalakshmi *et al.*, 1990).

Green house technology enables protecting the plants from adverse climatic conditions and providing optimum conditions of light, temperature, humidity, CO₂ and air circulation for the growth of plants to achieve maximum yield and best quality. Thus, a greenhouse is covered structure with transparent material that protects plants from vagaries of weather or environment *i.e* wind, precipitation, excess solar radiation, temperature extremes and also to some extent from attack of pest and diseases. Fertigation system is most suitable approach for cultivation of capsicum.

MATERIALS AND METHODS

The experiment was conducted in polyhouse of precision farming development centre, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during *Kharif* season of 2011-12. Experiment comprised of four levels of fertigation viz., 60

* Author for correspondence

Table 1 : Effect of different fertigation levels on morpho-physiological and yield of capsicum under greenhouse condition

Treatments	Plant height (cm)	Stem girth (cm)	Number of branches/plant	Dry matter accumulation (g)	Days to first flowering	Days to first fruiting	Yield q/ha
T ₁ (control)	109.10	5.67	2.97	56.85	22.12	33.28	415.99
T ₂ (60%) RDF	118.62	7.65	3.27	69.25	20.58	30.19	445.25
T ₃ (80%) RDF	125.42	8.25	3.97	84.27	17.85	27.49	569.28
T ₄ (100%) RDF	137.25	7.89	3.48	86.21	24.25	35.19	485.45
S.E. _±	1.25	0.81	1.24	1.65	1.21	1.57	2.15
C.D. at 5%	3.35	1.86	3.12	4.54	3.28	3.12	5.24

per cent, 80 per cent, 100 per cent and control. The design adopted for experiment was randomized block design with three replications. Using the spacing between row to row and plant to plant 45x60 cm. Observations were recorded on five randomly selected plants in each plot with different characters *i.e.* plant height, stem girth, secondary branches, dry matter production, days to first flowering, days to first fruiting yield was also analyzed at maturity. Statistical analysis was done as per the procedure given by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

Data recorded on the effect of different levels of fertigation on plant height of sweet pepper are presented in Table 1. Maximum plant height was found under the treatment T₄ (137.25) followed by treatment T₃ (125.42). While, minimum plant height was obtained in treatment T₁ (109.10 cm). The taller plant height with 100% RDF through fertigation might be due to the optimum availability of moisture which facilitated for production of better root biomass resulting better nutrient uptake from the soil (Sasikala *et al.*, 2007)

Maximum stem girth was observed under the treatment T₃ (8.25) followed by treatment T₄ (7.89). While minimum stem girth found under the treatment T₁ (5.67). The number of branches improved significantly over the control with different fertigation levels. Maximum branches was obtained under the treatment T₃ (3.97) and minimum observed under the control (2.97). Similarly result was found for the dry matter accumulation.

Observations recorded on the effect of different levels of fertigation on days to first flowering of sweet pepper are presented in Table 1. It is evident from the data presented in Table 1 that significantly maximum number of days were taken to first flowering under the treatment T₄ (24.25) followed by T₁ (22.12), T₂ (20.58), and T₃ (17.85). Significantly minimum number of days were taken to first flowering under the treatment T₃ (17.85). The temperature plays a key role in flower growth, development and fruit set in sweet pepper. Fertigation affects the temperature of micro climate around the plants. The greater influence of temperature and increased photosynthesis might have influenced to the initiation of first flowering, number of flowers per plant due to different levels of fertigation. Similar results were corroborated with the findings of Locher *et al.* (2003) in sweet pepper crop.

The result related to days to first fruiting recorded on the effect of different levels of fertigation of Sweet Pepper are presented in Table 1. It is evident from the data presented in Table 1 that significantly maximum number of days were taken to first fruiting under the treatment T₄ (35.19) followed by T₁ (33.28), T₂ (30.19), and T₃ (27.49). Significantly minimum number of days were taken to first fruiting under the treatment T₃ (27.49). The temperature plays a key role in fruit growth, development and fruit set in sweet pepper.

Data with respect to fruit yield as influenced by different levels of fertigation are presented in Table 1. It is apparent

from the data that the total fruit yield ranged from 415.99 to 559.28 q per ha. Significantly maximum fruit yield per ha was found in T₃ (569.28 q/ha) followed by T₄ (485.45 q/ha), T₂ (445.25.00 q/ha), and T₁ (415.99 q/ha). Significantly minimum fruit yield per hectare was obtained in T₁ (415.99 q./ha). The results are directly correlated with fruit yield per plant or per plot. Present results are in close conformity with the findings of Ombodi *et al.* (2008) in sweet pepper.

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