

Effect of Fertilizer Application and Type of Irrigation on Growth and Yield of Chilli cv. Sitara.

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ABSTRACT: A Field experiment was conducted at ASPEE Agricultural Research and Development Foundation Farm, Village Nare, Taluka Wada, District Thane, Maharashtra on chilli crop during December 2011-12. The application of 100% recommended dose of fertilizers (RDF) 37.5:25:50 NPK kg/ha through drip irrigation was observed the best for plant growth and green chilli yield of cv. Sitara.

Keywords: Fertilizer, irrigation, growth, yield, chilli and Sitara, etc.

INTRODUCTION

Chilli is an important cash crop in India and is grown for its pungent fruits which are used both green and ripe (the latter in the dried form) to impart pungency to the food. Green chillies are rich in Vitamins A and C, minerals and protein. Dry chillies are also rich in Vitamins A and D. As a condiment, it has become indispensable in every Indian home. It is also used medicinally, sauces, chutneys and pickles. It is reported to have many medicinal values of chilli. Its paste is externally used as rubefacient and as local stimulant for the tonsils in tonsillitis. It is irritant internally and produces gastroenteritis. It is used with many ingredients for local remedies. In West Indies, it is used to relieve the sinking at the epigastrium felt by drunkards. The pungency is due to the oleoresin capsaicin (a volatile alkaloid and its acidity is due to capsaicin) contained in skin and septa of the fruit. Chilli was known to Indians about 400 years ago when this crop was first introduced into India by Portuguese towards the end of 15th century. Its cultivation became popular in the 17th century. It is now grown in almost all parts of the country covering about 7.4 lakh ha area. Chilli is valued for its diverse commercial uses. Only a few perennial chilli varieties characterized by small-sized pods, upright fruiting and high pungency are rarely cultivated commercially.

Chilli (*Capsicum annum* L.) is an important spice cum vegetable crop cultivated extensively in India. India contributes one fourth of world's production of chilli with an average annual production of 12.89 lakh tonnes in an area of 7.59 lakh ha (Anon., 2005). Indian chilli is exported to over 90 countries. In recent years, apart from export (105,000 tonnes) of dry chilli, value added products viz., the chilli powder and also the oleoresin are exported with the annual total revenue of about Rs. 388 crores (Anon., 2004). In Sikkim, cherry pepper known as dale khorsani is the most favorite chilli grown in almost every kitchen garden. *Capsicum* (chillies) constitutes the most important spice grown all over the world except in colder parts. There are many varieties differing in habit, size, shape, colour and pungency of fruit. Among these paprika's with mild pungency cultivated mainly in European countries, viz. Hungary, Spain, Bulgaria, Rumania and Poland. Chillies with higher pungency grown in tropical countries, viz. India, China, Pakistan, Nigeria, Malaysia, Japan and Turkey are important. Total world chilli production in green form is 7 to 8 mt (2 to 3 mt in dry form). Hence with a view to study the effect of different doses of fertilizers and type of irrigation application on yield of chilli, the present investigation is contemplated.

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MATERIALS AND METHODS

An experiment was undertaken at ASPEE Agricultural Research and Development Foundation Farm, Village Nare, Taluka Wada, District Thane during 2011-12. The treatments were two methods of irrigation viz., flood and drip and four levels of fertilizers application viz., 50, 75 and 100 percent recommended dose of fertilizers (37.5:25:50 NPK kg/ha) along with no fertilizer-control. Thus total eight treatment combinations (I_1F_0 , I_1F_1 , I_1F_2 , I_1F_3 , I_2F_0 , I_2F_1 , I_2F_2 , I_2F_3) were tried in Randomized Block Design (RBD) with three replications. Chilli variety used was Sitara. The variety was transplanted at 45cm x 30cm in a plot of 5.4m x 3.6m size on 22.11.2011. Indoxacarb 15% EC was sprayed uniformly for control of fruit borer as and when required. All recommended agronomical practices were adopted during the period of experimentation. Observations on plant growth parameters viz., plant height and number of branches / plant at 45 and 90 DAP and green chilli yield were recorded. Data were statistically analyzed using appropriate statistical method.

RESULTS AND DISCUSSION

Data presented in Table 1 revealed that all the characters except number of branches/plant at 90 DAP under study statistically differed from each other due to various treatments. Among the combinations of method of irrigation and levels of fertilizer tried on chilli crop under field condition, fertilizer application through drip irrigation was more effective than flood irrigation. This may be due to the fact that in drip irrigation, fertilizer is applied right in the rhizosphere of the plant so that it will be directly absorbed by the plant roots. Irrespective of different levels of RDF, drip irrigation increased plant height and number of branches recorded at 45 and 90 DAP and finally the fruit yield over flood irrigation. Increase in percentage of RDF invariably increased plant growth and development and enhanced / increased green chilli fruit yield over other treatment combinations. Similarly result observed by Dharne and Kabre (2009), Prabhakar and Hebbar (2005) and Prabhakar *et al*, (1987). Hence, application of 100% RDF through drip irrigation was found best from plant growth and development as well as green chilli yield as compared to other treatment combinations (Fig.1). Fertigation allows nutrient placement directly into the plant root zone during critical periods of nutrient demand (Mikkelsen, 1989 and Kozhushka and Romanets, 1994).

Table 1
Effect of Fertilizer Application and Method of Irrigation on Growth and Yield of chilli cv. Sitara.

Treatment	Plant height (cm) (n=5)		No. of branches / plant (n=5)		Green chilli Yield (t/ha)
	45 days	90 days	45 days	90 days	
I_1F_0	22.7	34.5	2.9	3.3	5.17
I_1F_1	24.0	35.3	2.9	3.4	8.23
I_1F_2	22.1	32.1	2.8	3.3	10.03
I_1F_3	21.4	34.4	3.2	3.7	13.08
I_2F_0	25.5	41.1	3.1	3.6	8.18
I_2F_1	24.0	38.7	3.5	3.9	13.24
I_2F_2	21.3	38.6	3.5	3.9	13.80
I_2F_3	20.3	37.9	3.6	3.9	15.77
SEm \pm	0.8	0.7	0.2	0.2	0.22
CD 0.05	2.6	2.1	0.5	NS	0.68
CV%	9.4	6.8	3.6	9.3	4.8

I_1 - Flood irrigation F_0 - No fertilizer application
 I_2 - Drip irrigation F_1 - 50% RDF
 F_2 - 75% RDF F_3 - 100% RDF

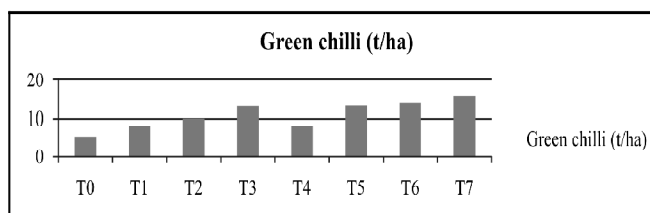


Figure 1: Effect of Fertilizer Application and Method of Irrigation on Growth and Yield of Chilli cv. Sitara.

CONCLUSION

Thus it can be concluded that, the application of 100% recommended dose of fertilizers (RDF) 37.5:25:50 NPK kg/ha through drip irrigation was the best for plant growth and green chilli yield (15.77 t/ha) view point.

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