

Effect of organic and inorganic manures on growth and yield of Chilli

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ABSTRACT

The present investigation entitled, "Effect of organic and inorganic manures on growth and yield of chilli", was conducted at All India Co-ordinate Research Project (Tropical Fruits), Dr. P. D. K. V., Akola (M.S.). The treatment of N125Kg / ha + FYM @ 10t/ha *Azospirillum* reported more plant height, number of braches per plant, days to first 50 per cent flowering, days to first harvest, number of fruits per plant, weight of individual fruit, fruit length and diameter, yield of wet red fruits, while least values for all above characters were recorded in control.

KEY WORDS : Organic, Inorganic, Chilli

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INTRODUCTION

Chilli (*capsicum annum* L.) is used as vegetable and also condiment but the chief use of chilli throughout the world is as spice on account of its pungency and pleasant flavour. Due to high cost of inorganic fertilizers and residual effects of chemicals there is increasing trends towards organic farming. Chilli has gained importance as a commodity of international market, its production in India could not be achieved to a desired extent. For boosting production and for sustainable agriculture, integrated nutrient management approach is gaining importance. Keeping in view, the importance of organic and inorganic manures in sustainable vegetable production a field experiment was conducted to study the effect of organic and inorganic manures on growth and yield of chilli

MATERIALS AND METHODS

The present investigation on effect of organic and inorganic manures on growth and yield of chilli was carried

out at All India co-ordinate Research Project, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.) during *Kharif* season of 2005-06. The experiment was laid out in Randomized Block Design with twelve treatments replicated thrice. The variety Jayanti was selected and planted at a spacing of 60cm x 60cm. The treatment details are

- T₁: N150 kg/ha + FYM @ 10 t/ha (RDF) (control)
- T₂: N150 kg/ha + FYM @ 10 t/ha + *Azospirillum*
- T₃: N150 kg/ha + FYM @ 5 t/ha
- T₄: N150 kg/ha + FYM @ 5 t/ha + *Azospirillum*
- T₅: N125 kg/ha + FYM @ 10 t/ha
- T₆: N125 kg/ha + FYM @ 10 t/ha + *Azospirillum*
- T₇: N125 kg/ha + FYM @ 5 t/ha
- T₈: N125 kg/ha + FYM @ 5 t/ha + *Azospirillum*
- T₉: N100 kg/ha + FYM @ 10 t/ha
- T₁₀: N100 kg/ha + FYM @ 10 t/ha + *Azospirillum*
- T₁₁: N100 kg/ha + FYM @ 5 t/ha
- T₁₂: N100 kg/ha + FYM @ 5 t/ha + *Azospirillum*

The treatment of biofertilizer *i.e.* *Azospirillum* was given to seedlings which were transplanted in T₂, T₄, T₆, T₈, T₁₀ and T₁₂ treatments plots. Roots of seedlings were dipped in the solution of *Azospirillum* for 10 min. The biometric observations, on plant height, diameter of stem (cm) number of braches per plant days to flower initiation, days to 50 per cent flowering, days required for first harvesting, number of fruits per plant, length of fruit (cm), breadth of fruit (cm), weight of fruit (g), wet red fruit yield, were recorded. The data of record were subjected to statistical analysis.

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RESULTS AND DISCUSSION

The results from Table 1 indicate that the chilli seedlings inoculated with *Azospirillum* along with organic and inorganic source of nutrients had a better response in respect to all vegetative characters as well as yields contributing characters of plant. The treatment of T₆ was found more effective in production increased plant height (61.44 cm) and diameter of stem (0.93cm) as compared to rest of the treatments under study, the lowest plant height (48.54 cm) and diameter of stem (0.83cm) were recorded in T₁₁. Number of branches was increased in T₆ (6.40) but there was no significant effect over all other treatments. The reason for increase in growth parameter of plant height might be due to enhancement of root development and nitrogen fixation by *Azospirillum*. The enhancement in growth and volume of plant may be due to more uptake rate of water and nutrients. It is clearly indicated that, plants treated with *Azospirillum*, cause production of phytohormones, resulting in increased plant height and stem diameter. These findings are closely similar to the findings of Paramguru and Natrajan (1993) and Naik *et al.*(2003) in chilli. Inoculation of chilli seedling with *Azospirillum* and 16.17 per cent reduction in nitrogen (T₆) observed earliest first flowering (34.43 days), 50 per cent flowering (39.96 days) and maturity of fruits (66.12 days) over control (T₁) where only recommended dose of fertilizer was applied. Similar justifications were reported by Jackson *et al.* (1965) in tomato and Amirthalingham and Balakrishanan (1988) in chilli. Auxins, gibberlines, cytokinins, phytoharmones and some antibiotics metabolites by *Azospirillum* play nutritional, stimulating and therapeutic role in the enhancement of plant growth and easilest maturity (Verma and Shende, 1997).

As regards the number of fruit per plant, the treatment (T₆) produced maximum number of fruit per plant (93.84), followed by (T₁). Similar increase in fruit number per plant due to *Azospirillum* inoculation has been reported by Amirthalingham and Balakrishanan (1988) in chilli. The length of fruits was significantly enhanced by T₆ (10.40cm) and was at par with T₂, T₁, T₅ and T₄. The increase in length of fruit might be due to effect of *Azospirillum* which accelerate the secretion of growth promoting substances resulting into elongation of fruits and it is similar with the findings of Prabhu (2002) in Okra.

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Treatments	No. of branches per plant		Days to 50% flowering		Days to maturity of fruits		No. of fruits per plant		Fruit length (cm)		Plant height (cm)		Stem diameter (cm)		Fresh weight (kg)		Dry weight (kg)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
T ₁	58.50	0.97	5.9	0.59	35.65	1.090	61.51	53.68	9.90	0.82	1.90	1.78	1.96	1.96	1.96	1.96	1.96	1.96
T ₂	57.00	0.92	6.13	0.55	35.25	1.055	66.11	57.90	10.05	0.87	1.98	1.83	1.98	1.98	1.98	1.98	1.98	1.98
T ₃	56.52	0.89	5.10	0.50	31.37	1.273	69.11	89.22	9.11	0.75	1.79	1.58	1.79	1.79	1.79	1.79	1.79	1.79
T ₄	51.23	0.90	5.63	0.50	31.02	1.201	61.01	57.11	9.37	0.71	1.82	1.61	1.82	1.82	1.82	1.82	1.82	1.82
T ₅	51.67	0.89	5.71	0.51	36.71	1.211	68.30	57.62	9.71	0.79	1.81	1.73	1.81	1.81	1.81	1.81	1.81	1.81
T ₆	67.11	0.93	6.10	0.50	37.73	39.96	66.12	93.87	10.10	0.89	2.12	1.95	2.12	2.12	2.12	2.12	2.12	2.12
T ₇	57.21	0.88	5.13	0.50	38.28	1.373	70.78	87.98	8.90	0.77	1.77	1.35	1.77	1.77	1.77	1.77	1.77	1.77
T ₈	55.03	0.88	5.21	0.50	31.92	1.281	71.33	79.07	9.10	0.72	1.78	1.71	1.78	1.78	1.78	1.78	1.78	1.78
T ₉	50.70	0.85	5.00	0.50	38.93	1.288	72.68	87.98	8.63	0.68	1.58	1.37	1.58	1.58	1.58	1.58	1.58	1.58
T ₁₀	57.21	0.87	5.07	0.50	38.82	1.365	72.31	78.92	8.75	0.70	1.66	1.35	1.66	1.66	1.66	1.66	1.66	1.66
T ₁₁	48.54	0.83	7.73	0.83	39.97	1.571	71.30	80.12	8.71	0.66	1.50	1.26	1.50	1.50	1.50	1.50	1.50	1.50
T ₁₂	49.19	0.87	7.80	0.58	39.10	1.173	73.67	82.75	8.60	0.67	1.55	1.30	1.55	1.55	1.55	1.55	1.55	1.55
T ₁₃	2.27	0.078	0.58	0.13	1.37	1.13	1.25	2.23	0.39	0.076	0.10	0.19	0.19	0.19	0.19	0.19	0.19	0.19
C.D (5% D.F)	6.29	0.078	0.68	0.20	3.68	3.20	3.57	6.26	1.09	0.035	0.28	1.17	0.28	0.28	0.28	0.28	0.28	0.28

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