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## Response of organic, inorganic and bio-fertilizers on growth and yield of Byadagi Chilli

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**Abstract :** A field experiment was carried out on block soil at Regional Agricultural Research Station, Raichur during *Rabi* 2003, to study the performance of chilli (cv. BYADAGI KADDI) to combined application of organic, inorganic and biofertilizers. Significant differences were observed among the treatments, in plant height(96.56 cm), number of branches(20.16), number of leaves(286.56), leaf area index(2.89), dry matter accumulation (118.50 g/plant) and stem girth(2.34 cm) when chilli supplemented with FYM @ 25 t/ha+ 100 per cent RDF, followed by chilli which was nourished with FYM @ 75 t/ha+ *Azospirillum*+ phosphate solubilizing bacteria(PSB)+ 25 per cent RDF (91.76cm, 18.21, 281.28, 2.61, 113.65 g/plant and 2.02cm, respectively of plant height, number of branches, number of leaves, leaf area index, dry matter accumulation and stem girth). Similarly, the yield was found highest (7.42 q/ha.) when chilli was applied with FYM(25 t/ha)+ RDF(100%). On the contrary the lowest yield(2.61 q/ha.) was observed in chilli when it was nourished with FYM @ 25 t/ha+ *Azospirillum*+ PSB.

**Key words :** Chilli, Organic, Inorganic, Bio-fertilizers, Growth, Yield

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During the mid sixties in India, the use of chemical fertilizers and pesticides has been on rising scale. The detrimental effects of indiscriminate use of these chemicals have been in recent past. The lands which have been applied with application of abundant quantity of chemical fertilizers alone have turned out to be less productive. Elimination of chemical fertilizers from the conventional farming system may cause a significant reduction in crop yield and result in loss of net profit or income of the farm. In order to avoid such problems, it is necessary to begin with adopting integrated soil building practices to improve and stabilize soil fertility and productivity. Use of organic and bio-fertilizers with little amount of inorganic fertilizers were found to be most effective to enhance yield and maintaining soil health.

Hence, an experiment was conducted to combine organic, inorganic and bio-fertilizer as nutrient supplement, so as to phase out use of inorganic fertilizers.

### RESEARCH METHODS

The field experiment was laid out in Randomized

Block Design at Regional Agricultural Research Station, Raichur during *Rabi* 2003. *Rabi* chilli was grown with different combination of organic, inorganic and bio-fertilizers consisting of 10 treatments. The soil was clay-loam in texture with pH of 7.93. The gross and net plot sizes were 4.8mx4.5m and 3.6mx3.0m, respectively. Five week old chilli(cv.Byadagi kaddi) seedlings were transplanted on October, 2003 at a spacing of 75x60cm. Well decomposed FYM was incorporated according to treatment combinations. *Azospirillum* and PSB were used as source of bio-fertilizers for both seed treatment and seedling treatment.

The picking of red chilli fruits was started from 60 days after planting and were dried on the floor. The treatment wise total production obtained from all pickings was expressed on hectare basis.

### RESEARCH FINDINGS AND DISCUSSION

The data on growth parameters recorded in chilli are presented in Table 1. There was significant difference among the treatments when chilli supplemented with FYM

@ 25 t/ha+ 100 per cent RDF recorded maximum plant height(96.56cm), number of branches(20.16), number of leaves per plant(286.56), leaf area index(2.89), dry matter accumulation(118.50g/plant) and stem girth(2.34cm). The minimum values for all these parameters were recorded in plants supplied with FYM @ 25 t/ha+ *Azospirillum*+ PSB.

There was a significant difference among the treatments for yield and yield parameters (Table-2). The plants supplied with FYM @ 25 t/ha+ 100 per cent RDF recorded maximum values for dry chilli yield (7.42 q/ha), 100 dry fruit weight(69.89 g), fruit length(13.85 cm) and fruit girth(0.95 cm), while minimum values for all these parameters were recorded in the plants supplied with FYM @ 25 t/ha+ *Azospirillum*+ PSB(55.00g, 10.23cm and 0.58cm, respectively for fruit weight, fruit length and fruit girth).

Impact of integrated nutrient management practices was analysed on the growth and yield performance of chilli. Significant differences were observed with respect to growth when chilli applied with FYM @ 25 t/ha+ 100 per cent RDF(100:50:50 NPK kg/ha) resulted in maximum plant height(96.56cm), number of branches(20.16), number of leaves(286.56), leaf area index(2.89), dry matter accumulation (118.50g/plant) and stem girth (2.34cm) followed by chilli which was supplied with FYM

@ 75 t/ha+ *Azospirillum*+ PSB+ 25 per cent RDF. The lowest growth parameters was observed in chilli nourished with FYM @ 25 t/ha+ *Azospirillum*+ PSB. These results in turn reflected on the productivity of chilli in a similar manner.

Significantly, the highest yield was obtained (7.42 q/ha) in chilli, due to application of FYM@ 25 t/ha+ 100 per cent RDF, which was followed by crop supplemented FYM @ 75 t/ha+ *Azospirillum*+ PSB + 25 per cent RDF (6.25 q/ha).

Combined application of organic and inorganic nutrient sources might have increased the concentration of nutrient ions in the soil solution and their uptake by plants, all the nutrients are important in several physiological process like growth and development of plants. The organic sources seems to act directly by increasing crop yield either by accelerating of respiratory process by cell permeability or by hormonal growth action. Organic sources supply NPK in available form to the plants through biological decomposition. They are also rich in micronutrients besides having plant growth promoting substances and humus forming microbes. Indirectly it improves physical properties of soil such as aggregation, aeration, permeability and water holding capacity.

Moreover, FYM seems to act directly in increasing

**Table 1 : Growth parameters of chilli as influenced by integrated nutrient management practices**

Treatments	Plant height at 120 DAT (cm)	Number of branches at 120 DAT	Number of leaves/plant at 120 DAT	Leaf area index (LAI)	Dry matter accumulation (g/pl.) at 120DAT	Stem girth (cm) at 120 DAT
T <sub>1</sub> - FYM @ 75 t/ha + 25% RDF	83.03	15.97	272.78	2.22	108.12	1.70
T <sub>2</sub> - FYM @ 50 t/ha + 25% RDF	82.23	15.68	269.86	2.20	106.51	1.68
T <sub>3</sub> - FYM @ 25 t/ha + 25% RDF	73.63	13.96	258.31	2.09	91.86	1.44
T <sub>4</sub> - FYM @ 75 t/ha + <i>Azospirillum</i> + PSB+ 25% RDF	91.76	18.21	281.28	2.61	113.65	2.02
T <sub>5</sub> - FYM @ 50 t/ha + <i>Azospirillum</i> + PSB+ 25% RDF	87.93	17.98	279.36	2.59	111.98	2.00
T <sub>6</sub> - FYM @ 25 t/ha + <i>Azospirillum</i> + PSB+ 25% RDF	77.13	14.76	263.08	2.18	96.16	1.61
T <sub>7</sub> - FYM @ 75 t/ha + <i>Azospirillum</i> + PSB	79.06	15.26	259.96	2.12	102.16	1.65
T <sub>8</sub> - FYM @ 50 t/ha + <i>Azospirillum</i> + PSB	76.10	14.32	265.75	2.16	93.96	1.56
T <sub>9</sub> - FYM @ 25 t/ha + <i>Azospirillum</i> + PSB	68.73	10.65	251.05	1.69	87.64	1.33
T <sub>10</sub> - FYM @ 25 t/ha + 100% RDF	96.56	20.16	286.56	2.89	118.50	2.34
S.E.±	1.41	0.43	1.37	0.12	1.05	0.03
C.D. (P=0.05)	4.20	1.30	4.08	0.36	3.12	0.08

FYM: Farm yard manur ,  
PSB: Phosphate solubilizing bacteria,

RDF: Recommended dose of fertilizers ;  
DAT: Days after transplanting.

**Table 2 : Yield parameters of chilli as influenced by integrated nutrient management practices**

Treatments	100 dry fruit weight (g)	Fruit length (cm)	Fruit girth (cm)	Yield (q/ha.)
T <sub>1</sub> - FYM @ 75 t/ha + 25% RDF	60.93	11.75	0.78	5.10
T <sub>2</sub> - FYM @ 50 t/ha + 25% RDF	62.57	11.70	0.76	5.02
T <sub>3</sub> - FYM @ 25 t/ha + 25% RDF	58.47	11.48	0.70	3.83
T <sub>4</sub> - FYM @ 75 t/ha + <i>Azospirillum</i> + PSB+ 25% RDF	66.74	12.82	0.81	6.25
T <sub>5</sub> - FYM @ 50 t/ha + <i>Azospirillum</i> + PSB+ 25% RDF	65.68	12.79	0.82	6.21
T <sub>6</sub> - FYM @ 25 t/ha + <i>Azospirillum</i> + PSB+ 25% RDF	59.12	11.61	0.73	4.54
T <sub>7</sub> - FYM @ 75 t/ha + <i>Azospirillum</i> + PSB	59.24	11.56	0.74	4.86
T <sub>8</sub> - FYM @ 50 t/ha + <i>Azospirillum</i> + PSB	58.79	11.51	0.71	4.17
T <sub>9</sub> - FYM @ 25 t/ha + <i>Azospirillum</i> + PSB	55.00	10.23	0.58	2.61
T <sub>10</sub> - FYM @ 25 t/ha + 100% RDF	69.89	13.85	0.95	7.42
S.E.±	0.62	0.32	0.03	0.35
C.D. (P=0.05)	1.85	0.95	0.10	1.06

FYM: Farm yard manure ; RDF: Recommended dose of fertilizers ; PSB: Phosphate solubilizing bacteria

crop yields either by accelerating respiratory process by increasing cell permeability, hormone growth action or by combination of all these processes. The beneficial effect of FYM on chilli yield is well documented by several workers (Subbaiah *et al.*, 1982; Damke *et al.*, 1988; Surlekov and Rankov, 1989; Nair and Peter, 1990; Natarajan, 1990; Ching Fang and Kvonon, 1994 and Chavan *et al.*, 1997).

This investigation clearly indicated that application of FYM @ 25 t/ha and 100 per cent RDF had beneficial effect on improving the growth and yield of red chilli. It is expected that continuous use of these with bio-fertilizers in long run may bring remarkable dividends.

## REFERENCES

- Chavan, P.J.**, Syed, I., Rudraksa, G.B., Malewar, G.V. and Baig, M.I. (1997). Effect of varies nitrogen levels through FYM and urea on yield, uptake of nutrients and ascorbic acid content in chilli. (*Capsicum annum* L.). *J. Indian Soc. Soil Sci.*, **45**(4):833-835.
- Ching Fang, H.** and Kvonon, H. (1994). Effect of organic manures on the growth and yield of selected pepper. *Bulletin of Jacking District Agriculture Improvement Station*, **42**:1-10.

**Damke, M.M.**, Rawarkhe, V.J. and Patil, C.V. (1988). Effect of phosphorus and potassium on growth and yield of chilli. *Punjabrao Krishi Vidyapeeth Res. J.*, **12**:110-114

**Meena, Nair** and Petel, K.V. (1990). Organic, inorganic fertilizer and their combination on yield and storage life of hot chilli. *Vegetable Sci.*, **17**:7-10.

**Natarajan, S.** (1990). Standardization of nitrogen application for chilli (*Capsicum annum* L.) growth under semi arid condition. *South Indian J. Hort.*, **38**: 315-318

**Subbaiah, K.**, Heliah, J., Ravikumar, V. and Rajagopal, L.K. (1982). Effect of combined application of organic and inorganic fertilizers on yield and nutrient uptake of MDU-1 chilli. *South Indian Hort.*, **30**:45-47.

**Surlekov, P.** and Rankov, V. (1980). The effect of fertilization on capsicum productivity and soil agrochemical and biological properties in monoculture. *Pochroznanie Agro Klhimiya*, **24**:17-23.

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