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# Effect of Organic Farming Practices on Productivity, Quality and Economics of Chilli Hybrids in Central Dry Zone of Karnataka, India

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## A B S T R A C T

Field experiments were conducted during *Kharif* season, 2013 and 2014 in red sandy clay loamy soil in farmer's fields at Talaku village of Chitradurga district, Karnataka to assess the effect of organic farming practices on productivity, quality and economics of chilli hybrids in Central Dry Zone of Karnataka. The experiment consists of four organic nutrient sources (S) and three chilli hybrids (V) laid out in Factorial Randomized Complete Block Design (FRCBD) with three replications. The results revealed that significantly higher yield (2940 kg $ha^{-1}$) and quality parameters viz., ascorbic acid (148.3 mg 100 $g^{-1}$), capsaicin content (1.9%), total extractable colour (158.5ASTA units), oleoresin (13.4%), oleoresin yield (388 kg $ha^{-1}$), lesser discolored fruits (2.3%) and yield of discolored fruits (67.7 kg $ha^{-1}$) were associated with application of vermicompost, silkworm waste and goat manure (75 kg N equivalent $ha^{-1}$ as basal dose at 1:1:1) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + 3 sprays of panchagavya (3%) at 25, 50 and 75 DAT ($S_3$) as compared to recommended chilli cultivation practices (137.5 mg 100 $g^{-1}$, 1.5%, 142.2 ASTA units, 11.2%, 320.8 kg $ha^{-1}$, 3.0, 86.6 kg $ha^{-1}$, respectively) except yield (2935 kg $ha^{-1}$). Among chilli hybrids KBCH-1 recorded significantly higher yield (3020 kg $ha^{-1}$) and quality parameters viz., ascorbic acid content (149.5 mg 100 $g^{-1}$), capsaicin (1.8%), oleoresin (13.4%), oleoresin yield (396.6 kg $ha^{-1}$) lower discoloured fruits (2.4 %) and discoloured fruit yield (70.4 kg $ha^{-1}$) as compared to the Arka Meghana (2845 Kg $ha^{-1}$, 145.1 mg 100 $g^{-1}$, 1.7 %, 12.7%, 350.5 kg $ha^{-1}$, 2.6, 74.9 kg $ha^{-1}$, respectively) and Devanur Deluxe (2551 kg $ha^{-1}$, 134.1 mg 100 $g^{-1}$, 1.6%, 11.1%, 274.2 kg $ha^{-1}$, 3.1 and 78.9 kg $ha^{-1}$, respectively). However, total extractable colour value was significantly higher with Devanur Deluxe (167.7 ASTA units) as compared to Arka Meghana and KBCH-1 (148.4 and 134.8 ASTA units, respectively). Whereas, Arka Meghana was medium in respect of yield as well as quality parameters. Similarly, higher gross returns, net returns and B:C ratio $ha^{-1}$ were registered (Rs. 2,99,338, Rs. 2,15,994 and 3.59, respectively) in chilli hybrid KBCH-1 raised on vermicompost, silkworm waste and goat manure (75 kg N equi. $ha^{-1}$ at 1:1:1 as basal) + EBDLM (75 kg N equi. $ha^{-1}$ as top dressing) + 3 sprays of panchagavya at (3%) followed by recommended chilli cultivation practices.

## Introduction

Chilli (*Capsicum annum* L.) is one of the most important commercial crop in India accounting 45 and 25 per cent of world acreage and production respectively (Anon., 2015) with an export earnings of 45 per cent of the total export of Spices (Anon., 2011). Consumer demand for organically grown food is markedly increasing all over the world for both in domestic and international market.

The demand for organic food is drastically changing due to humans concern over health and its use in cosmetic industry which made him to produce chilli free from harmful chemicals. Now, the challenges are how to produce chilli in ways that environmentally friendly without lowering the yield level achieved under recommended chilli cultivation practices. Lower productivity and quality of chilli was attributed to poor soil health due to continuous supply of chemical fertilizers, imbalanced supply of nutrients, low yielding potential of chilli cultivars and incidence of pest and diseases.

Application of conventional organic manures *viz*., farmyard manure, compost with low nutrient content and application rate coupled with slow nutrient release pattern could not satisfy crop demand for expression of full yield potential and quality of the fruits. Besides, declining in availability of manures due to decrease in cattle population in recent years and utilization of agriculture wastes into valuable by-products have made availability of organic manures is questionable both in time and quantity (Latha and Sharanappa, 2014b). Hence, an attempt was made to utilize all the on-farm waste, green waste ubiquitous plants in combination with vermicompost, silkworm waste and goat manure as organic nutrient source as well as to identify location specific chilli cultivar/hybrid this study was undertaken in Central Dry Zone of Karnataka.

## Materials and Methods

The field experiments were conducted at Talaku village of Challakere taluk, Chitradurga district during *Kharif* season of 2013 and 2014 in red sandy clay loamy texture (coarse sand 33.58%, fine sand 37.81%, silt 6.8% and clay 21.0%) with bulk density of 1.47 g $cc^{-1}$. The soil pH was slightly alkaline (7.7) and the electrical conductivity was normal (0.25 $dSm^{-1}$). The soil was low in organic carbon (0.47%), medium inavailable nitrogen (289.7 kg $ha^{-1}$), phosphorus (52.4 kg $ha^{-1}$) and potassium (165.2 kg $ha^{-1}$). The study included 12 treatment combinations comprising three chilli hybrids viz., KBCH-1, Arka Meghana and Devanur Deluxe and four organic nutrient sources viz., vermicompost (75 kg N equivalent $ha^{-1}$ as basal dose) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + 3 sprays of panchagavya (3 %) at 25, 50 and 75 DAT ($S_1$), vermicompost and silkworm waste (75 kg N equivalent $ha^{-1}$ as basal dose at 1:1) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + 3 sprays of panchagavya (3 %) at 25, 50 and 75 DAT ($S_2$), vermicompost, silkworm waste and goat manure 75 kg N equivalent $ha^{-1}$ as basal dose at 1:1:1) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + 3 sprays of panchagavya (3 %) at 25, 50 and 75 DAT ($S_3$), recommended chilli cultivation practices (150:75:75 kg NPK $ha^{-1}$) ($S_4$). The NPK was supplied through urea, SSP and MOP. The experiment was laid in a factorial randomized complete block design and each treatment replicated three times. Six weeks old seedlings were transplanted in the main field at 60 cm x 60 cm spacing on first fortnight of August, 2013 and second fortnight of July, 2014. All the treatments were imposed as per the treatment details. The organic manures and enriched biodigested liquid organic manure were applied on nitrogen equivalent basis. BDLM was prepared by using gliricidia (*Gliricidium sepium*) green biomass chopped material

which was biodigested using fresh dung, cattle urine and water in 3:1.5:2:10 ratio, respectively, in a cylindrical drum incubated for 45 days under aerobic condition and stirred regularly (Reddy and Prasanna,2011) and Pradeep Gopakkali and Sharanappa (2014). This was enriched with 10 per cent neem cake. All the manurial sources used were analyzed for their nutrient concentration and total quantity of manure required was computed on N equivalent basis. Panchagavya was prepared by using fresh cow dung (7 kg) and ghee (1 kg), which were mixed together and kept as such in plastic container for two days.

On 3rd day, 1 L cow urine, 10 L each of curd, milk and tender coconut water, 100 g yeast, 250 g jaggery and 12 ripened bananas were added to it. The contents were stirred for 15 days thoroughly thrice a day and then filtered through thin muslin cloth and was used as foliar spray at 3 per cent (Somasundaram and Singaram, 2006). Farmyard manure, vermicompost, silkworm waste and goat manure were collected in the farmer's field. The NPK content was analysed for their nutrient composition as per the standard procedure. FYM at 25t/ha was applied two weeks before sowing of the crop and incorporated into the soil. The quantity of vermicompost, silkworm waste and goat manure required for applied as basal to individual treatments and mixed thoroughly into the soil. The crop was transplanted on 08-08-2013 (1st crop) and 22-07-2014 (2nd crop) and harvested 15th of January, 1st, 15th of February 2014 (1st crop) and 25th of December of 2014 and 12th and 22nd of January of 2015 (2nd crop) and fruit yield was recorded as per the standard procedure.

## Estimation of quality parameters

The quality parameters, viz., ascorbic acid content of green chilli (mg 100 $g^{-1}$), total capsaicin content (%) of powdered dry chilli and per cent oleoresin were estimated as outlined by Sadasivam and Manickam (2004), total extractable colour value measured in ASTA Units (American Spice Trade Association) analytical method (Anon., 2004) and discolored fruits from net plot yield were recorded and weighed and discolored fruits yield per hectare was computed and expressed in kg $ha^{-1}$.

Ascorbic acid was calculated using the formula

$$\text{Mg of ascorbic acid100 g}^{-1} = \frac{\text{Titer value} \times \text{Dye factor} \times \text{Volume made}}{\text{Weight of sample} \times \text{Aliquot of extract taken}} \times 100$$

Oleoresin yield per ha was worked out using the following formula

Oleoresin yield kg $ha^{-1}$ = Fruit yield – discolored fruits x (Oleoresin per cent in fruits x 100)

Per cent Capsaicin = (Capsaicin /1000 × 1000 × Weight of sample (g)) x 100

ASTA colour unit was calculated as per the formula given below

$$\text{ASTA colour unit} = \frac{\text{Absorbance at 460 nm} \times 16.4}{\text{Weight of sample (g)}}$$

## Statistical analysis of data

The data on yield and quality parameters were subjected to statistical analysis using Fisher's method of analysis of variance as outlined by Gomez and Gomez (1984). The level of significance used in 'F' and't' tests was p=0.05. Critical difference values were calculated, wherever F test was found significant. Results have been interpreted and discussed based on the pooled data analysis of two years (2013 and 2014).

## Results and Discussion

### Effect organic farming practices on yield (kg ha$^{-1}$)

Significantly higher yield (Table 1) was recorded with the application of vermicompost, silkworm waste and goat manure (75 kg N equi. as basal dose at 1:1:1) + EBDLM (75 kg N equi. as topdressing in 3 splits) + 3 sprays of panchagavya at 3 %. However, it was on par with the recommended chilli cultivation practices.

Higher yield might be due to availability of optimum quantity of required macro and micro nutrients through different organic nutrient sources and the release of which may be match with crop demand, besides improving the soil condition due to microbial population in the soil, which enhanced root proliferation and synchronized source to sink relationship.

Hence, there was better growth and developments and leading to better yield. Similar results were also found by (Santhosh Kumar Kattimani and Shashidhara, 2006) and (Pradeep Gopakkali and Sharanapp, 2014). Further, application of Panchagavya promoted transfer of nutrients applied to plant through foliar spray and the quantities of IAA and GA present in panchagavya might have created the stimuli in the plant system which in turn increased the production of growth regulators in cell system (Latha and Sharanappa, 2014). This might have stimulated better plant growth and development leading to higher yield. The data indicated that among the chilli hybrids KBCH-1 recorded significantly higher dry fruit yield followed by Arka Meghana and Devanur Deluxe. (Santhosh Kumar Kattimani and Shashidhara, 2006) also reported better performance of Vietnam-2 (1108 kg ha$^{-1}$) as compared to Bydagi dabbi and Bydagi kaddi in Zone 8 of Karnataka.

### Effect of organic farming practices on quality parameters of chilli

Effect of organic farming practices on quality parameters of chilli is presented in Table 1 and 2. Application of vermicompost, silkworm waste and goat manure (75 kg N equi. ha$^{-1}$ at 1:1:1 as basal) + EBDLM (75 kg N equi. ha$^{-1}$ as top dressing) + 3 sprays of panchagavya at 3 % recorded significantly higher ascorbic acid content (mg 100 g$^{-1}$), per cent capsaicin, total extractable colour value (ASTA units), per cent oleoresin, oleoresin yield (kg ha$^{-1}$) and lower per cent of discoloured fruit and discoloured fruit yield (kg ha$^{-1}$) followed by vermicompost and silkworm waste (75 kg N equi. ha$^{-1}$ at 1:1 as basal) + EBDLM (75 kg N equi. ha$^{-1}$ as top dressing) + 3 sprays of panchagavya at 3 % and vermicompost (75 kg N equi. ha$^{-1}$ as basal) + EBDLM (75 kg N equi. ha$^{-1}$ as top dressing) + 3 sprays of panchagavya at 3 % application which were at par with each other. However, significantly lower ascorbic acid content (mg 100 g$^{-1}$), per cent capsaicin, total extractable colour value (ASTA units), per cent oleoresin, oleoresin yield (kg ha$^{-1}$) and higher per cent of discoloured fruit and discoloured fruit yield (kg ha$^{-1}$) were recorded with recommended chilli cultivation practices. The improvement in quality attributes with panchagavya might be ascribed to beneficial effects of panchagavya on crop quality in chilli (Pradeep Gopakkali and Sharanappa, 2014a). Yadav and Christopher (2006) also reported higher sensory characters like colour, texture and taste in rice sprayed with panchagavya. The higher oleoresin content can be attributed to higher fruit yield and higher fruit weight, colour and oleoresin are closely related to K content of fruits. Cazi (1961) reported a direct relationship between colour value of chilli fruits and K supply to plants. The colour in chilli fruits has close relation with K and Fe content of fruits (Kaminwar and Rajagopal, 1993).

**Table.1** Dry fruit yield and quality parameters of chilli fruits as influenced by nutrient sources and hybrids (Pooled data of 2 years)

| Treatments | Dry chilli yield (kgha$^{-1}$) | Ascorbic acid (mg 100 g$^{-1}$) | Capsaicin content (%) | Total extractable colour (ASTA units) |
|---|---|---|---|---|
| **Nutrient Source (S)** | | | | |
| **Vermicompost (75 kg N equivalent ha$^{-1}$ as basal dose) + EBDLM (75 kg N equivalent ha$^{-1}$ top dressing) + PG spray at 3 % ($S_{1)}$** | 2646 | 142.0 | 1.6 | 149.6 |
| **Vermicompost (75 kg N equivalent ha$^{-1}$ as basal dose) + EBDLM (75 kg N equivalent ha$^{-1}$ top dressing) + PG spray at 3 % ($S_{2)}$** | 2699 | 143.7 | 1.8 | 151.0 |
| **Vermicompost and silkworm waste and goat manure (75 kg N equivalent ha$^{-1}$ as basal dose at 1:1:1) + EBDLM (75 kg N equivalent ha$^{-1}$ top dressing) + PG spray at 3 % ($S_3$)** | 2940 | 148.3 | 1.9 | 158.5 |
| **Recommended chilli cultivation practices (150, 75 and 75 kg N, $P_2O_5$ and $K_2O$ ha$^{-1}$) ($S_4$)** | 2935 | 137.5 | 1.5 | 142.2 |
| **S. Em±** | 66.5 | 1.6 | 0.05 | 2.4 |
| **C. D. at 5 %** | 189.2 | 4.3 | 0.15 | 6.8 |
| **Chilli Hybrids (V)** | | | | |
| **KBCH-1($V_1$)** | 3020 | 149.5 | 1.8 | 134.8 |
| **Arka Meghana ($V_2$)** | 2845 | 145.1 | 1.7 | 148.4 |
| **Devanur Deluxe ($V_3$)** | 2551 | 134.1 | 1.6 | 167.7 |
| **S. Em±** | 57.6 | 1.3 | 0.05 | 2.1 |
| **C. D. at 5 %** | 163.8 | 3.7 | 0.13 | 5.9 |
| **Interaction (S x V)** | | | | |
| **S. Em±** | 115.0 | 2.7 | 0.1 | 4.2 |
| **C. D. at 5 %** | NS | NS | NS | NS |

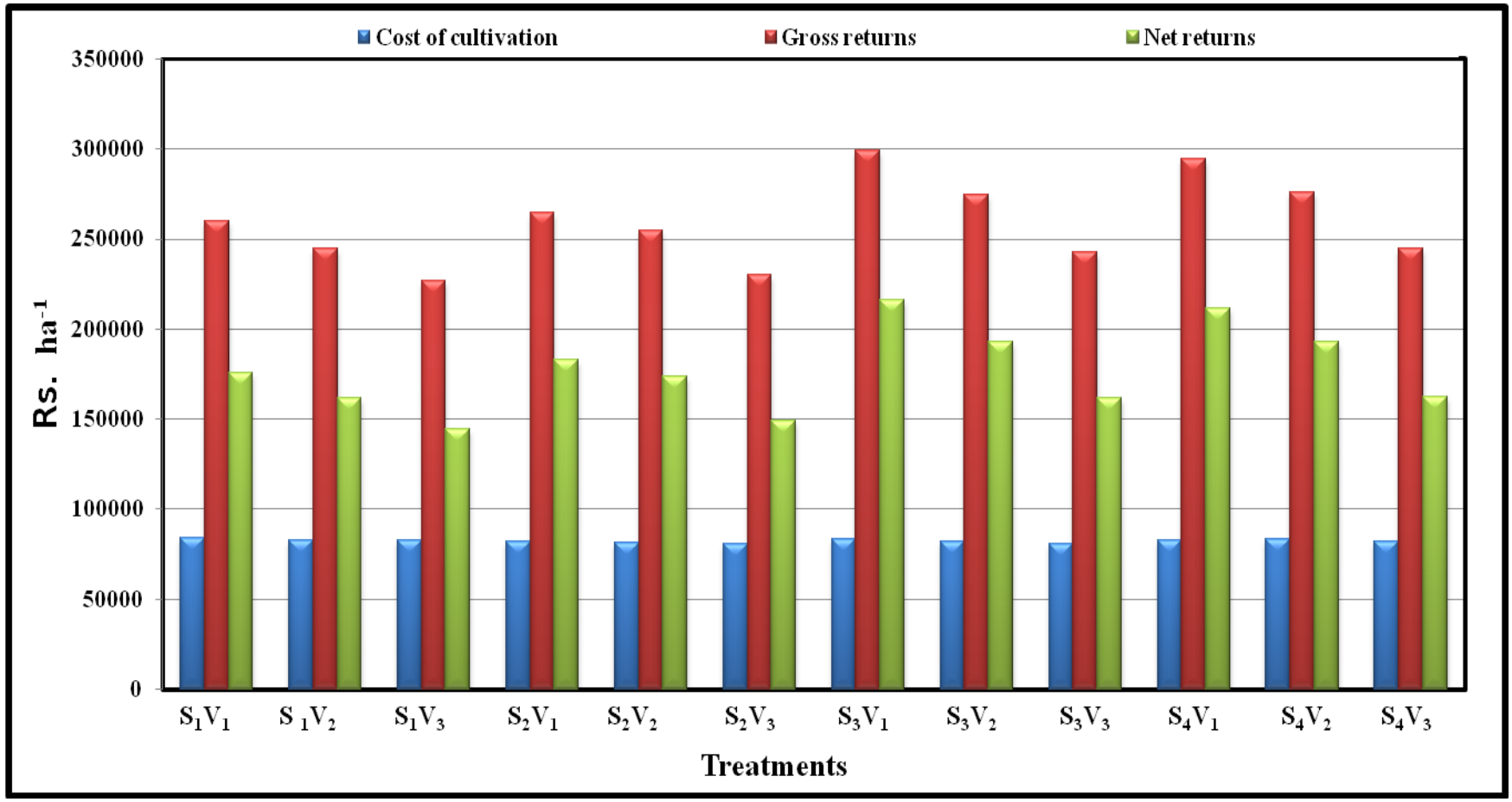
Note : Enriched biodigested liquid manure (EBDLM) was applied to soil at 25, 50 & 75 days after transplanting (DAT); All the nutrient sources were supplied with FYM at 25 t ha$^{-1}$ ; PG: Panchagavya was sprayed on foliage at 25, 50 & 75 DAT.; NS: Non-significant.

**Table.2** Quality parameters of chilli fruits as influenced by nutrient sources and hybrids (Pooled data of 2 years)

| Treatments | Oleoresin (%) | Oleoresin yield (kg $ha^{-1}$) | Discoloured fruits (%) | Yield of discoloured fruit (kg $ha^{-1}$) |
|---|---|---|---|---|
| **Nutrient Source (S)** | | | | |
| Vermicompost (75 kg N equivalent $ha^{-1}$ as basal dose) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + PG spray at 3 % ($S_{1)}$ | 12.4 | 321.6 | 2.8 | 72.8 |
| Vermicompost (75 kg N equivalent $ha^{-1}$ as basal dose) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + PG spray at 3 % ($S_{2)}$ | 12.5 | 331.3 | 2.7 | 71.6 |
| Vermicompost and silkworm waste and goat manure (75 kg N equivalent $ha^{-1}$ as basal dose at 1:1:1) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + PG spray at 3 % ($S_3$) | 13.4 | 388.0 | 2.3 | 67.7 |
| Recommended chilli cultivation practices (150, 75 and 75 kg N, $P_2O_5$ and $K_2O$ $ha^{-1}$) ($S_4$) | 11.2 | 320.8 | 3.0 | 86.6 |
| S. Em± | 0.3 | 8.7 | 0.1 | 1.5 |
| C. D. at 5 % | 0.9 | 24.2 | 0.2 | 4.1 |
| **Chilli Hybrids (V)** | | | | |
| KBCH-1($V_1$) | 13.4 | 396.6 | 2.4 | 70.4 |
| Arka Meghana ($V_2$) | 12.7 | 350.5 | 2.6 | 74.9 |
| Devanur Deluxe ($V_3$) | 11.1 | 274.2 | 3.1 | 78.9 |
| S. Em± | 0.3 | 7.6 | 0.1 | 1.3 |
| C. D. at 5 % | 0.8 | 20.9 | 0.2 | 3.6 |
| **Interaction (S x V)** | | | | |
| S. Em± | 0.5 | 15.1 | 0.1 | 2.6 |
| C. D. at 5 % | NS | NS | NS | NS |

Note: Enriched biodigested liquid manure (EBDLM) was applied to soil at 25, 50 & 75 days after transplanting (DAT); All the nutrient sources were supplied with FYM at 25 t $ha^{-1}$; PG: Panchagavya was sprayed on foliage at 25, 50 & 75 DAT.; NS: Non-significant.

**Fig.1** Economics of chilli production as influenced by the nutrient sources




Legend:

$S_1$: Vermicompost (75 kg N equivalent $ha^{-1}$ as basal dose) + Enriched biodigested liquid manure (EBDLM) (75 kg N equivalent $ha^{-1}$ top dressing) + PG spray at 3%

$S_2$: Vermicompost and silkworm waste (75 kg N equivalent $ha^{-1}$ as basal dose at 1:1) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + PG spray at 3%

$S_3$: Vermicompost and silkworm waste and goat manure (75 kg N equivalent $ha^{-1}$ as basal dose at 1:1:1) + EBDLM (75 kg N equivalent $ha^{-1}$ top dressing) + PG spray at 3%

$S_4$: Recommended chilli cultivation practices (150, 75 and 75 kg N, $P_2O_5$ and $K_2O$ per ha)

$V_1$: KBCH-1, $V_2$: Arka Meghana, $V_3$: Devanur Deluxe

The potassium and iron are known to exhibit synergistic effect, which may be attributed to the increased K supply there by increasing the Fe uptake by plants and promoting synthesis of ferrodoxin (iron and sulphur proteins), which are the molecules of oleoresin. Higher oleoresin yield can be attributed to higher fruit yield and lesser discoloured fruit per cent and higher fruit weight. The results are in conformity with the findings of Shashidhara and Shivamurthy (2008) and Malawadi *et al.*, (2004). Organic nutrient sources have desirable effect on fruit growth, development and quality and delaying the ripening and senescence, thus resulting in good quality fruits (Sharma, 1996) due to supply of secondary nutrients as well as micronutrients.

Among chilli hybrids, KBCH-1 recorded significantly higher ascorbic acid content (mg 100 $g^{-1}$), per cent oleoresin, oleoresin yield (kg $ha^{-1}$), lower per cent discoloured fruits, discoloured fruit yield (kg $ha^{-1}$) as compared to Arka Meghana and Devanur Deluxe. Whereas, significantly higher total extractable colour value (ASTA units) was observed in Devanur Deluxe followed by Arka Meghana and KBCH-1. However, Arka Meghana was medium in all the quality parameters. The findings are in accordance with Santhosh Kumar Kattimani and Shashidhara (2006) also recorded higher oleoresin per cent, oleoresin yield, lower per cent discoloured fruits, discoloured fruit yield as compared to Bydagi Dabbi and Byadagi Kaddi and better performance of Vietnam-2 in Zone 8 by Ramakrishna (2002).

## Effect of organic farming practices on Economics of chilli

In the present study, higher gross returns, net returns and B:C ratio $ha^{-1}$ (Fig. 1) were registered (Rs. 2,99,338, Rs. 2,15,994 and 3.59, respectively) in chilli hybrid KBCH-1 raised on vermicompost, silkworm waste and goat manure (75 kg N equi. $ha^{-1}$ at 1:1:1 as basal) + EBDLM (75 kg N equi. $ha^{-1}$ as top dressing) + 3 sprays of panchagavya at 3 % because of higher yield and market price prevailing for the current grade/quality which was closely followed by recommended chilli cultivation practices. Similar results of higher gross returns, net returns and B:C ratio were obtained with the application of EBDLM and panchagavya in Bydagi chilli by Pradeep Gopakkali and Sharanappa (2014a), Latha and Sharanappa (2014b) in onion and Santhosh Kumar Kattimani and Shashidhara (2006) in Vietnam-2 with combinations of FYM @ 10 t per ha along with RDF as compared to Cv. Bydagi Dabbi and Byadagi Kaddi under similar treatments and Jayasheelan and Ramesh Kumar (2002) under eco-friendly organic farming obtained 23 per cent saving in expenditure and 73 per cent more profits than chemical farming.

## References

Anonymous, 2004, Extractable colour in capsicums and their oleoresins, method 20.1 Official Analytical Methods of the American Spice Trade Association, New Jersey, 4th Edition (revised), pp.89-91.

Anonymous, 2011. Spice exports Peak and Cross US $ 1500 million in 2010-11, Spice India, pp.8-10

Anonymous, 2015, http://www.indiastat.com.

Cazi, A. K. B., 1961, Use more fertilizers for bumper chilli crop. *Fert. News*, 6(8):16-18.

Gomez, K. A. and Gomez, A. A., 1984, *Statistical Procedures for Agriculture Research*.2nd Ed. John Wiley & Sons, New York.

Jayasheelan, V. and Ramesh Kumar, M., 2002, Food safety with special reference to eco-friendly and chemical based farming project work done at KAPV,

*Hr. Sec. School, Tiruchanapalli, Tamil nadu.*

Kaminwar, S. P. and Rajagopal, V., 1993, Fertilizer response and nutrient requirement of rainfed chillies in Andhra Pradesh. *Fert. News*, 36(7): 21-26.

Latha, H.S. and Sharanappa, 2014, Production potential, nutrient-use efficiency and economics of groundnut (*Arachis hypogaea*) - Onion (*Allium cepa*) cropping system under organic nutrient management. *Indian J. Agron.*, 59(1):59-64.

Latha, H. S. and Sharanappa, 2014a, Effect of organic crop production technique on the quality of soil and crops, Sustainability of yield in groundnut-onion sequential cropping system. *Indian J. Agril. Sci.*, 84(8):999-1003.

Malawadi, M. N., Shashidhara, G. B. and Palled, Y. B., 2004, Effect of secondary and micronutrients on yield, nutrient uptake and quality of chilli. *Karnataka J. Agric. Sci.*, 17(3): 553-556.

Pradeep Gopakkali and Sharanappa, 2014, Effect of organic production techniques on the growth, yield, quality and economics of chilli (*Capsicum annum*) and soil quality in dry zone of Karnataka. *Indian. J. Agron.*, 59(1): 151-156.

Pradeep Gopakkali and Sharanappa, 2014a, Effect of organic farming practices on growth, yield, quality and economics of onion (*Allium cepa*) in dry zone of Karnataka.*Indian. J. Agron.*, 59(2):336-340.

Ramakrishna, T., 2002, Effect of plant geometry and fertilizer levels on growth, yield and quality of chilli (Cv Vietnam-2). *M.Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad.

Reddy, M. and Prasanna, 2011, Phosphorus availability to green gram as influenced by organic amendments. *J. Indian Soc. Soil Sci.*, 48(2): 298-305.

Sadasivam, S. and Manickam, A., 2004, *Biochemical methods for agricultural sciences*, Wiley Eastern Limited, New Delhi, pp.178- 192.

Santhosh Kumar Kattimani and Shashidhara, G.B., 2006, Integrated nutrient management in Chilli Genotypes. *Karnataka J. Agric. Sci.*, 19(3):506-512.

Sharma, S. K., 1996, Response of nitrogen and phosphorus on plant growth and fruit yield of hybrid sweet pepper cultivar Pusa Deepti. *Veg. Sci.*, 22: 19-21.

Shashidhara, G. B. and Shivamurthy, D., 2008, Studies on the effect of integrated nutrient management on growth, yield and yield parameters of chilli genotypes under vertisol of North Transition Zone of Karnataka. *Karnataka J. Agric. Sci.*, 21(3): 433-435.

Somasundaram, E. and Singaram, P., 2006, Modified panchagavya for sustainable organic crop production. *National Seminar on Standards and Technologies of Non-conventional Organic Inputs*.

Yadav, B. K. and Christopher, L. A., 2006, Effect of organic manures and panchagavya spray on rice (*Oryza sativa* L.) quality. *Crop Res.*, 31(1): 6-10.

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