Original Research Article

Seed yield and economic returns in coriander in relation to different nutrient combinations.

ABSTRACT

Organic manures along with the chemical fertilizers tend to reduce the total cost of cultivation and supplement the crop with the essential nutrients for growth and development of the plant. In view of this an experiment was conducted in coriander during winter season of 2012-13 at college of agriculture, Jabalpur, Madhya Pradesh to assess the effect of organic and inorganic sources of nutrient with different levels on various parameters of coriander. Results with regard to various levels of organic manures shows that poultry manure 5 t ha^{-1} produced the maximum number of umbels per plant (33.67), the maximum number of umbellets per umbel (7.06), maximum number of seeds per umbel (33.69), maximum weight of seeds per umbel (0.44g), maximum number of seeds per plant (603.75) and significant maximum seed yield per plant (6.09 g), seed yield per plot (1.85 kg) and seed yield per hectare (17.30 q). Results in relation to fertilizer levels shows that the maximum number of umbels per plant (33.46), maximum number of umbellets per umbel(7.04) , maximum number of seeds per umbel (33.29), maximum weight of seeds per umbel (0.45 g), maximum seed yield per plant (6.01g), yield per plot (1.87kg) and seed yield per hectare (17.53 q) were recorded with 100 % RDF. Results in relation to interaction effect of different treatments shows that, the significant maximum number of umbels per plant (36.27), maximum number of umbellets per umbel(7.71), maximum number of seeds per umbel (36.74), maximum weight of seeds per umbel (0.49 g), maximum number of seeds per plant (701.97) and the significant maximum seeds yield per plant (7.14g), seed yield per plot (2.04 kg) and seed yield hectare (19.16 q) were observed in poultry manure 5 t ha^{-1} + 100 % RDF. The highest net return and cost benefit ratio 1: 2.98 with treatment combination T_5 (Poultry manure 5 t ha^{-1} + 100 % RDF).

INTRODUCTION

Coriander (*Coriandrum sativum*) is an annual herb which possesses nutritional and medicinal properties in the family Apiaceae (Reference). Coriander is originated from the Eastern Mediterranean region. Coriander is one of the most commonly used spices (Leena et al., 2012). It is one of the important seed spices occupying a prime position throughout the globe to add taste, flavor and pungency in various food items. It is a multipurpose herb grown mainly for its foliage and seeds (Burdock and Carabin, 2009). Since the coriander seeds have strong and typical scent, they are appreciated worldwide as basic ingredients of many traditional foods, particularly curry powder (Mahendra and Bisht, 2011; Sahib et al., 2013). Moreover, it is a frequent ingredient in the preparation of ayurvedic medicines and is a traditional home therapy for different ailments viz., rheumatism, joint pain, gastrointestinal, complaints, flatulence, indigestion, insomnia, convulsions, anxiety, loss of appetite Emamghoreishi *et al*., (2005), etc. Health benefits of coriander include treatment of swellings, diarrhoea, mouth ulcers, anaemia, digestion, menstrual disorders, small pox, eye care, conjunctivitis, skin disorders, blood sugar disorders, protects and soothes liver etc Diwan et al. (2018). Green leaf is having high essential oil with good aroma and flavour Lal et al. (2020). The essential oil content in seeds of coriander is 0.47–0.53 per cent whereas major chemical constituents of essential oil are linalool, linalyl acetate along with other important constituents such as thymol, geraniol, carophyllene and pinene.(Reference)

In India, coriander is mainly cultivated in Rajasthan, Madhya Pradesh, Uttar Pradesh and Southern States like Andhra Pradesh, Karnataka and Tamil Nadu. It takes approximately 100 days for maturity whereas the smaller-seeded coriander takes a longer growing period. The spice is an important item of international

trade. Producers thinking about growing coriander should investigate the current pricing of the crop as prices can vary. Due to global competition, the Canadian coriander is uniform in size with good seed quality and reported more competent for export market. It was reported that www.IndianJournals.com Members Copy, Not for Commercial Sale Downloaded From IP - 14.139.243.180 on dated 22-Nov-2014 348 Sharma et al. Economic Affairs Print ISSN: 0424-2513 Online ISSN: 0976-4666 in India, the area under coriander is increasing as per our domestic demand. The increase in overall production of coriander seeds in India is mainly due to the advancement of production technology through the National Agriculture Research System and educating the farmers through various training programmes. Introduction of high yielding varieties, new production techniques, integrated nutrient management and sowing of crops as per soil/land suitability are the major production factor for the higher productivity. Application of fertilizer has been documented to enhance plant growth and development. Particularly nitrogen (N) is one of the greatest production inputs. Nitrogen is an essential nutrient in creating the plant dry matter, as well as many energy-rich compounds that regulate photosynthesis and plant production. Comparisons between inorganic and organic fertilizer-N sources are hard to perform since there is usually a dramatic difference in N availability from these two sources of N. Comparisons on the basis of similar amounts of total N applied are therefore of limited relevance to agricultural practice, whereas comparisons on the basis of similar N availability are hindered by the lack of reliable nitrogen release estimates for organic fertilizer sources derived from animal manures (Van Kessel and Reeves, 2002). Organic fertilizers in comparison with the chemical one have lower nutrient content and are slow to release but they are as effective as chemical fertilizers over longer periods of use (Sharafzadeh and Ordookhani. 2011).Organic manure must be added to conventional NPK fertilizer to improve soil structure, make the soil easier to

cultivate, encourage root development, provide with nutrients and enable their increased uptake by plants. The application of nutrients through various sources is newer approach and being advocated for sustainable production. The integrated nutrient management has a crucial role in improving the plant physiology characters that builds levels of resistance and reduces the incidence of disease and pest attacks (Mirchandani and Mirchandani, 2005). Therefore, present study was taken to develop a suitable nutrient management practice for coriander crop adopting organic manures.

MATERIALS AND METHODS

The field experiment was conducted at Horticulture complex Deptt of Horticulture, JNKVV, Jabalpur, Madhya Pradesh during the winter seasons (Rabi) of 2012-2013. The Design of experiment was Asymmetrical Factorial RCBD with 3 replications. The experiment consisted of 12 treatments T1- FYM @ 20 t/ha + 100 % RDF , T2-FYM @ 20 t/ha + 50 % RDF, T3-FYM @10 t/ha + 100 % RDF, T4-FYM @ 10 t/ha + 50 % RDF, T5-Poultry manure @ 5 t/ha + 100 % RDF , T6-Poultry manure @ 5 t/ha + 50 % RDF, T7- Poultry manure @ 2.5 t/h + 100 % RDF, T8- Poultry manure @ 2.5 t/ha + 50 % RDF, T9-Vermicompost @ 5 t/ha + 100 % RDF, T10-Vermicompost @ 5 t/ha + 50 % RDF, T11-Vermicompost @ 2.5 t/ha +100% RDF, T12-Vermicompost @ 2.5 t/ha +50 % RDF. Proper leveling was done in order to facilitate the irrigation. Layout of the experiment was done as per plan of the investigation and treatments as given. The well decomposed FYM, Poultry manure and Vermicompost was applied in required plots before sowing of seeds. It was mixed well in each plot by light ploughing. Half amount of N with full amount of P and K were given per plot as basal dose and rest amount of N was given as top dressing after 40 days of sowing. Prior to sowing coriander variety JD-1 seeds were splited into two halves by

rubbing seeds were treated with thiram @ 2 g/kg of seeds was done thoroughly against seed borne diseases. The sowing of seeds was done as per treatments in prepared plots. Seeds were sown at 30 cm row spacing apar. The first light irrigation was provided just after sowing and subsequent irrigations were given at 15-20 days intervals to maintain the soil moisture till crop maturity. All the cultural operations were done as and when required for good crop stand. Other operations were done as per operation schedule. Precautionary two sprays of Dithane M-45 (0.03%) were done against diseases in the main field. Similarly two sprays of Rogor (0.03%) were done against insects in the main field as precautionary measure. Due to large population of plants in the plots, it was rather difficult to record the observation in each plant in the experiment field. Since, all the plants have equal opportunity for their growth and development. Therefore, a technique of random sampling was adopted and a sample of five plants from each plot was drawn at random to record the yield and yield attribute. The following growth, yield and quality components (Number of umbels per plant, Number of umbellets per umbel, Number of seeds per umbel, Weight of seeds per umbel (g), Number of seeds per plant, Seed yield per plant (g), Seed yield per plot (kg), Seed yield per hectare) were taken into observation and they were subjected to statistical analysis in order to draw the valid conclusion on the basis of C.D. value. To find out the economic feasibility of various treatment combinations, economics of the various treatments were worked out by calculating parameters like cost of cultivation, gross returns, net returns and benefit cost ratio using the prevailing price of inputs and outputs in local market.

RESULT AND DISCUSSION.

EFFECT OF VARIOUS LEVELS OF ORGANIC MANURES AND FERTILIZERS ON YIELD AND YIELD PARAMETERS.

The application of organic manures significantly improves the various yield parameters and consequently yield *viz*., number of umbels per plant, number of umbelets per umbel, number of seeds per umbel, weight of seeds per umbel , seed yield per plant (g), seed yield per plot (kg) and seed yield per hectare (q ha^{-1}) of coriander.

NUMBER OF UMBELS PER PLANT .

Number of umbels per plant of coriander were significantly affected by various organic manures. Among the organic manures, poultry manure @ 5 t ha^{-1} produced the maximum number (33.67) of umbels per plant followed by vermicompost @ 5 t ha^{-1} (32.33). The least number (30.57) of umbels per plant was recorded in FYM @ 10 t ha^{-1} . Poultry manure @ 5 t ha^{-1} was significantly superior over vermicompost and FYM . The present findings are in accordance with Ibrahim *et al*. (2006) and El- Mekawey *et al*. (2010)(What numbers did they obsereve?) . Number of umbels per plant were significantly influenced with regard to application of fertilizer levels. The maximum number (33.43) of umbels per plant were observed in the application of 100 % RDF and the minimum (30.31) in the application of 50 % RDF 100 % RDF was found to be significant over 50 % RDF. The present findings are in accordance with Singh and Jat (2002) ; Okut and Ydrm (2005); Kumar *et al*. (2007); Nagar *et al*.(2009); Nayak *et al*. (2009); Jan *et al*. (2011) and Khalid (2012)(What numbers did they obsereve?) .. In case of interaction effects, number of umbels per plant was significantly influenced by the treatment combinations. The maximum number (36.27) of umbels per plant were recorded with the application of poultry manure @ 5 t ha^{-1} + 100 % RDF followed by vermicompost @ 5 t ha^{-1} + 100 % RDF (34.13). The least number (29.03) of umbels per plant were recorded in FYM @ 10 t ha^{-1} + 50% RDF. Poultry manure @ 5 t ha^{-1} + 100 % RDF was significant over all other

interactions. The present findings corroborated the results of Choudary *et al* (2011) for number of pods per plant in fenugreek. The increase in number umbels per plant might be due to increased supply of major plant nutrients that are required in larger quantities for growth and development of plants. Nitrogen accelerates the growth, development reproductive phases and protein synthesis in plants, thereby promoting higher number of umbels per plant.

NUMBER OF UMBELLETS PER UMBEL .

Number of umbellets per umbel were not found to be significantly influenced by the treatments with various organic manures. However, Poultry manure @ 5 t ha $^{-1}$ produced the maximum number (7.06) of umbellets per umbel followed by vermicompost @ 5 t ha $^{-1}$ (6.82). Whereas the least number (6.37) of umbellets per umbel were recorded in FYM @ 10 t ha $^{-1}$. Number of umbellets per umbel were significantly influenced with regard to fertilizer levels. The maximum number of umbelets per umbel (7.04) were found with 100 % RDF and the minimum (6.27) with 50 % RDF. 100 % RDF is found to be significant over 50 % RDF. The present findings are in propinquity with Kumar *et al*. (2007). The interaction effect on number of umbellets per umbel was observed to be non significant. However , the maximum number (7.71) of umbellets per umbel were recorded with poultry manure @ 5 t ha $^{-1}$ + 100 % RDF followed by vermicompost @ 5 t ha $^{-1}$ + 100 % RDF (7.11). The least number (5.97) of umbellets per umbel was recorded in FYM @10 t ha $^{-1}$ + 50 % RDF.

NUMBER OF SEEDS PER UMBEL .

Number of seeds per umbel was significantly improved by various levels of organic sources. Among the organic sources, poultry manure @ 5 t ha $^{-1}$ recorded the maximum number (33.69) of seeds per umbel followed by vermicompost @ 5

t ha $^{-1}$ (32.52). However, the least number (29.85) of seeds per umbel were recorded in vermicompost @ 2.5 t ha $^{-1}$. Effect of poultry manure @ 5 t ha $^{-1}$ was significantly superior over vermicompost and FYM . Number of seeds per umbel was significantly influenced with regard to fertilizer levels. The maximum number (33.29) of seeds per umbel were recorded in 100 % RDF and the minimum (29.33) in 50 % RDF. 100 % RDF was found to be significant over 50 % RDF . The present findings are in accordance with Singh and Jat (2002) and Nayak *et al*. (2009). The interaction effects on number of seeds per umbel were found to be significant. Significantly maximum number (36.74) of seeds per umbel were recorded in poultry manure @ 5 t ha $^{-1}$ + 100 % RDF followed by vermicompost @ 5 t ha $^{-1}$ + 100 % RDF (34.14). The least number (27.73) of seed per umbel were recorded in vermicompost @ 2.5 t ha $^{-1}$ + 50% RDF. These findings are quite similar findings were reported by Choudary *et al* .(2011) for seeds per pod in fenugreek and Moslemi *et al. (*2012). An increase in the number of seeds per umbel might be attributed to increased supply of major plant nutrients. Nitrogen accelerates the growth, development, reproductive phases and protein synthesis there by promoting higher seeds per umbel.

WEIGHT OF SEEDS PER UMBEL .

Weight of seeds per umbel (g) by the use of different levels of organic sources was found non significant. However, among the organic manures, poultry manure @ 5 t ha $^{-1}$ produced the maximum weight of seeds per umbel (0.44g) followed by vermicompost @ 5 t ha $^{-1}$(0.43). The minimum weight of seeds per umbel (0.37g) was recorded in vermicompost @ 2.5 t ha $^{-1}$. With regard to the fertilizer levels, variation in weight of seeds per umbel (g) was found significant .The maximum weight of seeds per umbel (0.45g) was recorded in 100 % RDF and the minimum (0.35g) in 50 % RDF. 100 % RDF was observed to be

significant over 50 % RDF. The interaction effects was not significant . However, the maximum weight of seeds per umbel (0.49 g) was found with poultry manure @ 5 t ha $^{-1}$ + 100 % RDF followed by vermicompost @ 5 t ha $^{-1}$+ 100 % RDF (0.48g). The least weight of seeds per umbel (0.32g) was recorded in vermicompost @ 2.5 t ha $^{-1}$ +50% RDF .

Table.1. Number of umbels per plant, number of umbellets per umbel, seed per umbel, number of seed per umbel and weight of seed per umbel with regard to various treatments of organic manures and fertilizer levels.

ORGANIC MANURES	NUMBER OF UMBELS PER PLANT			NUMBER OF UMBELLETS PER UMBEL			SEEDS PER UMBEL			NUMBER OF SEEDS PER UMBEL			WEIGHT OF SEED PER UMBEL (G)		
	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean
FYM @ 20 t/ ha	32.67	30.73	31.70	6.99	6.29	6.64	33.07	29.07	31.07	33.07	29.07	31.07	0.47	0.34	0.41
FYM @ 10 t/ ha	32.10	29.03	30.57	6.78	5.97	6.37	31.43	28.33	29.88	31.43	28.33	29.88	0.42	0.33	0.37
PM @ 5 t/ ha	36.27	31.07	33.67	7.71	6.40	7.06	36.74	30.63	33.69	36.74	30.63	33.69	0.49	0.39	0.44
PM @ 2.5 t/ ha	33.33	30.73	32.03	6.87	6.13	6.50	32.37	29.33	30.85	32.37	29.33	30.85	0.45	0.36	0.40
VC @ 5 t/ ha	34.13	30.53	32.33	7.11	6.54	6.82	34.13	30.90	32.52	34.13	30.90	32.52	0.48	0.38	0.43
VC @ 2.5 t/ ha	32.07	29.77	30.92	6.81	6.20	6.51	31.97	27.73	29.85	31.97	27.73	29.85	0.42	0.32	0.38
MEAN	33.43	30.31	31.87	7.04	6.26	6.65	33.29	29.33	31.31	33.29	29.33	31.31	0.45	0.35	0.40
	(OM)	(RDF)	(OM) x (RDF)	(OM)	(RDF)	(OM) x (RDF)	(OM)	(RDF)	(OM) x (RDF)	(OM)	(RDF)	(OM) x (RDF)	(OM)	(RDF)	(OM) x (RDF)
SEm±	0.259	0.150	0.367	NS	0.162	NS	0.355	0.205	0.502	0.355	0.205	0.502	0.041	0.024	0.058
CD @ 5%	0.760	0.439	1.075	-	0.475	-	1.042	0.601	1.473	1.042	0.601	1.473	-	0.070	-

FYM- Farmyard manure, PM- Poultry manur, VC- Vermicompost , OM- organic manures, RDF- recommended dose of fertilizers, DAS- Days after sowing.

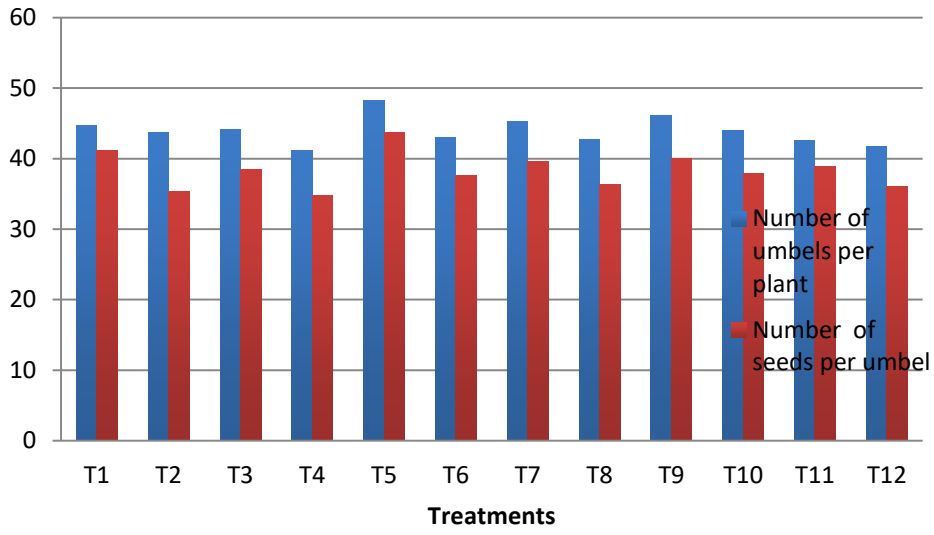

Fig 1. Graph representing variation in number of umbels per plant and number of seed per umbel due to various treatment interactions.

NUMBER OF SEEDS PER PLANT .

Number of seeds per plant was found to be significantly influenced by various organic manures. Among the organic manures, poultry manure @ 5 t ha $^{-1}$ produced the highest number of seeds per plant (603.75) followed by vermicompost @ 5 t ha $^{-1}$(550.44). The least number of seeds per plant (488.54) was noted in FYM @ 10 t ha $^{-1}$. Poultry manure @ 5 t ha $^{-1}$ were significant over vermicompost and FYM. Number of seeds per plant were significantly influenced with regard to fertilizer levels. The maximum number of seeds per plant (590.48) were recorded with 100 % RDF and the minimum (475) in 50 % RDF. 100 % RDF was observed to be significant over 50 % RDF . The present findings are in propinquity with Manure *et al*. (2000) and Channabasavanna *et al*. (2002). The interaction effect on number of seeds per plant was found to be significant. The maximum number of seeds per plant (701.97) were found with poultry manure 5

t ha $^{-1}$ + 100 % RDF followed by vermicompost @ 5 t ha $^{-1}$ + 100 % RDF (598.34). While it was observed to be minimum (440.51) in FYM @ 10 t ha $^{-1}$ + 50% RDF. Application of poultry manure @ 5 t ha $^{-1}$ + 100 % RDF were significant over all the other interactions .

SEED YIELD PER PLANT .

Seed yield per plant (g) was influenced significantly by the use of various organic manures . Among the organic manures, poultry manure @ 5 t ha $^{-1}$ produced the maximum seed yield per plant (6.09g) followed by vermicompost @ 5 t ha $^{-1}$ (5.53 g). Whereas, the minimum seed yield per plant (4.25 g) was recorded in FYM @ 10 t ha $^{-1}$. Effect of poultry manure @ 5 t ha $^{-1}$ was significant over vermicompost and FYM . The present findings are in accordance with El-Mekawey *et al*. (2010). Seeds yield per plant was significantly influenced by fertilizer levels. The highest seed yield per plant (6.01 g) were recorded in 100 % RDF and mimimum (4.25g) in 50 % RDF. 100 % RDF was observed to be significant over 50 % RDF . The present findings are in accordance with Manure *et al*. (2000); Kumar *et al*. (2007); Nayak *et al*. (2009) and Khalid (2012). The interaction effect on seed yield per plant was found significant. The maximum seed yield per plant (7.14 g) was recorded in poultry manure @ 5 t ha $^{-1}$ + 100 % RDF followed by vermicompost @ 5 t ha $^{-1}$ + 100 % RDF (6.72 g) and the minimum seed yield per plant (3.62g) was recorded in FYM @ 10 t ha $^{-1}$ + 50 % RDF. However, critical difference between poultry manure @ 5 t ha $^{-1}$+ 100 % RDF and vermicompost @ 5 t ha $^{-1}$ + 100 % RDF was found at par .

SEED YIELD PER PLOT AND SEED YIELD PER HECTARE .

Seed yield per plot and seed yield per hectare was influenced significantly by the use of various organic manures. It was observed that among the organic

manures, poultry manure @ 5 t ha $^{-1}$ produced the maximum seed yield per plot (1.85 kg) and seed yield (17.07 q ha^{-1}) followed by vermicompost @ 5 t ha $^{-1}$(1.82 kg and 17.07 q ha^{-1} respectively). The least seed yield per plot (1.49kg) and seed yield (14.02 q ha^{-1}) was noted in FYM @ 10 t ha $^{-1}$. However, difference in between poultry manure and vermicompost was non significant and which were at par . The maximum seed yield per plot (1.87 kg) and seed yield per hectare (17.53 q) was found in 100 % RDF and the minimum (1.53 kg and 14.30 q respectively) in RDF 50 % . 100 % RDF was found to be significant over 50 % RDF . Similar results are reported by Manure *et al*.(2000); Naghera *et al*. (2000); Singh *et al*. (2000); Singh and Jat (2002); Channabasavanna (2002); Kumar *et al*. (2002); Garg *et a*l. (2004); Gujar *et al*.(2005); Tripathi (2006); Akbarinia *et al*. (2006); Oliveira *et al*. (2006); Kumar *et al*. (2008) and Nagar *et al*. (2009). Based on the interaction effects on the maximum seed yield per plot (2.04 kg) and seed yield per hectare (19.16 q) were recorded with poultry manure @ 5 t ha $^{-1}$ + 100 % RDF followed by vermicompost @ 5 t ha $^{-1}$ + 100 % RDF (1.98kg and 18.53q respectively). While the minimum seed yield per plot (1.27 kg) and seed yield per hectare (11.90 q) was recorded in FYM @ 10 t ha $^{-1}$ + 50% RDF. However, difference in between poultry manure 5 t ha $^{-1}$ and vermicompost @ 5 t ha $^{-1}$ was not found to be significant and values were at par. Similar results have also been reported by Mohamed and Abdu (2004); Sadanandan and Hamza (2006) in black pepper. Aishwath *et al*. (2010); Choudary *et al.* (2011) in fenugreek and Jan *et al.* (2011). The probable reason for enhanced seed yield might be due to cumulative effects of nutrient (macro and micro) on vegetative growth which ultimately led to more photosynthetic activities while, application of organic, inorganic and bio-fertilizers enhance carbohydrate and nitrogen metabolism of pectic substances, as well as improve the water metabolism and water relation in the plants.

Table.2. Number of seeds per plant, seed yield per plant (g), seed yield per plot (kg) and seed yield per hectare (q) with regard to various treatments of organic manures and fertilizer levels.

ORGANIC MANURES	NUMBER OF SEEDS PER PLANT			SEED YIELD PER PLANT (G)			SEED YIELD PER PLOT (KG)			SEED YIELD PER HECTARE (Q)		
	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean	100% RDF	50% RDF	Mean
FYM @ 20 t/ ha	591.37	475.65	533.51	5.78	4.50	5.14	1.90	1.59	1.74	17.81	14.89	16.35
FYM @ 10 t/ ha	536.49	440.59	488.54	4.89	3.62	4.25	1.72	1.27	1.49	16.14	11.90	14.02
PM @ 5 t/ ha	701.97	505.53	603.75	7.14	5.04	6.09	2.04	1.65	1.85	19.16	15.43	17.30
PM @ 2.5 t/ ha	571.76	480.02	525.89	6.27	4.13	5.20	1.82	1.52	1.67	17.08	14.20	15.64
VC @ 5 t/ ha	598.34	502.54	550.44	6.72	4.34	5.53	1.98	1.67	1.82	18.53	15.61	17.07
VC @ 2.5 t/ ha	542.92	440.51	491.72	5.23	3.88	4.56	1.75	1.47	1.61	16.43	13.77	15.10
MEAN	590.48	474.14	532.31	6.01	4.25	5.13	1.87	1.53	1.70	17.53	14.30	15.91
	(OM)	**(RDF)**	**(OM) x (RDF)**	**(OM)**	**(RDF)**	**(OM) x (RDF)**	**(OM)**	**(RDF)**	**(OM) x (RDF)**	**(OM)**	**(RDF)**	**(OM) x (RDF)**
SEm±	5.101	2.945	7.213	0.206	0.119	0.291	0.019	0.011	0.028	0.177	0.102	0.300
CD @ 5%	14.960	8.637	21.157	0.604	0.349	0.855	0.057	0.033	0.081	0.520	0.251	0.735

FYM- Farmyard manure, PM- Poultry manur, VC- Vermicompost , OM- organic manures, RDF- recommended dose of fertilizers.

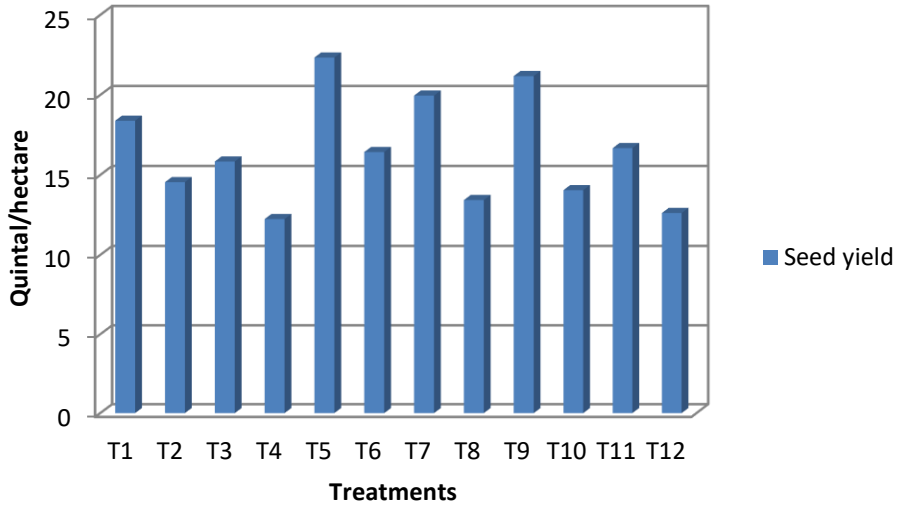

Fig 2. Graph representing variation in seed yield due to various treatment interactions.

ECONOMICS OF VARIOUS TREATMENTS.

The economics of crop production is a very important part of cultivation of any crop. The cost of cultivation was directly associated with various inputs *viz*. cost of chemical fertilizers, FYM , poultry manure and vermicompost. Gross income was found directly associated with the seed yield under various treatments

Cost of cultivation (Rs./ha):

The highest cost of cultivation Rs 57650.6 ha. was calculated under T9- (Vermicompost @ 5 t ha^{-1} + 100 %RDF) followed by T10- Vermicompost @ 5 t ha^{-1} + 50 % RDF) (Rs- 56825.3 /ha.). While the minimum cost of cultivation (Rs 43025.30 /ha.) was recorded by the use of T8- (Poultry manure @ 2.5 t ha^{-1} + 50 %RDF).

Gross income (Rs./ha):

The maximum gross income (Rs 134120.00 /ha.) was calculated in the treatment T5 (Poultry manure @ 5 t ha^{-1} + 100 % RDF) followed by T9 Vermicompost @ 5 t ha^{-1}+ 100 % RDF) with (Rs 129710.00 /ha)(While the

minimum Rs 89810.00 /ha.) was found in the treatment T4- (FYM @ 10 t ha^{-1} + 50 %RDF)

Net profit (Rs. /ha):

The maximum net profit (89069.4 Rs/ha.) was obtained in T5 (Poultry manure @ 5t ha^{-1} + 100 % RDF) which is the best as compared to other treatments followed by T1(FYM @ 20 t ha^{-1} + 100 % RDF) (Rs 79419.4 Rs ha^{-1}), however the minimum net income Rs 46684.7/ha was obtained in treatment T4 ((FYM @ 10 t ha^{-1} + 50 % RDF).

Cost: Benefit ratio:

The maximum cost: benefit ratio (1: 2.98) was noted under the treatment T5 (Poultry manure @ 5 t ha^{-1} + 100 % RDF) followed by T1 (FYM @ 20 t ha^{-1} + 100 % RDF) (1:2.76). However, the minimum cost: benefit ratio (1: 1.95) was recorded from T12 (Vermicompost @ 2.5 t ha^{-1} +50 % RDF).

Table .3. Economics of crop in relation to different treatments.

Symbol	Treatments	Yield (q/ha.)	Cost of cultivatin (Rs. /ha.)	Gross income (Rs. /ha.)	Net income (Rs./ha.)	Cost : Benefit Ratio
T_1	FYM 20 t/ ha + 100 % RDF	17.81	45250.6	124670	79419.4	1:2.76
T_2	FYM 20 t/ ha + 50 % RDF	14.92	44425.3	104440	60014.7	1:2.35
T_3	FYM 10 t/ ha + 100 % RDF	16.14	43950.6	112980	69029.4	1:2.57
T_4	FYM 10 t/ ha + 50 % RDF	12.83	43125.3	89810	46684.7	1:2.08
T_5	Poultry manure 5 t/ ha + 100 % RDF	19.16	45050.6	134120	89069.4	1:2.98
T_6	Poultry manure 5 t/ ha + 50 % RDF	15.43	44225.3	108010	63784.7	1:2.44

T_7	Poultry manure 2.5 t/h +100 % RDF	17.08	43850.6	119560	75709.4	1:2.73
T_8	Poultry manure 2.5 t/ ha + 50 % RDF	14.2	43025.3	99400	56374.7	1:2.31
T_9	Vermicompost 5 t/ ha + 100 % RDF	18.53	57650.6	129710	72059.4	1:2.25
T_{10}	Vermicompost 5 t/ ha + 50 % RDF	15.61	56825.3	109270	52444.7	1:1.92
T_{11}	Vermicompost 2.5 t/ ha +100 % RDF	16.43	50150.6	115010	64859.4	1:2.29
T_{12}	Vermicompost 2.5 t/ ha +50 % RDF	13.77	49325.3	96390	47064.7	1:1.95

CONCLUSION.

The study shows that both the nutrient sources i.e. organic manures and inorganic fertilizers responded well in terms of yield and yield parameters. The interaction of both the nutrient sources showed significant effect on yield and economics. It is concluded that the application of poultry manure @ 5 t ha^{-1} + 100 % RDF (50:30:60 kg NPK/ ha) recorded the maximum seed yield of coriander variety JD-1 along with highest net profit and cost benefit ratio 1:2:98 followed by FYM @ 20 t ha^{-1} + 100% RDF .

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