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Performance of city compost on growth, yield and economic of scented rice variety

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Abstract
A field experiment was conducted at Research cum Instructional Farm, IGKV, Raipur during *kharif* 2017 and 2018 to evaluate the performance of organic sources city compost with integrated nutrient management on growth, yield and economics of scented rice varieties. The five (5) treatments of INM *viz.* No fertilizer (N_1), 75% RDN through city compost + PSB + Azotobacter + BGA (N_2), 75% RDN through FYM + PSB + Azotobacter + BGA (N_3), 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) and 50% RDN through FYM + 50% RDN through chemical fertilizers (N_5), where in sub-plotscented rice variety was taken i.e. Chhattisgarh Dubraj selection-1 (V_1), Jawaphool (V_2) and TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1) (V_3) were tested in split plot design with 5 main plots and 3 sub plots in 3 replications. The growth, yield attributing characters and productivity of scented rice was recorded significantly highest under treatments 75% RDN through city compost + PSB + Azotobacter + BGA (N_2), which was comparable with 75% RDN through FYM + PSB +Azotobacter + BGA (N_3). Among scented rice varieties, TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1) (V_3) has produced significantly highest growth and yield attributes.

Keywords: City compost, scented rice varieties, INM, and economics

Introduction
Rice (*Oryza sativa* L.) is touted one of the most valuable cereal crops of the earth after wheat as which provide half the daily food for one of every three persons in the world's population and also it is major source of daily calories and protein requirement (Rohit, 2011) [25]. In India, rice has occupied an area of 43.99 hectare providing 112.910mt of production and productivity of 2578 kg ha^{-1} (https://www.indiastat.com 2018). Chhattisgarh state is commonly known as "Rice bowl of India" having around 3.75 m hectares area with the production of 7.49 mt and productivity 1322 kg ha^{-1} (Krishi Darshika 2016) [12]. Scented rice occupies an important status in domestic as well as in international market due to its several outstanding qualities and therefore, could provide better venues towards high remuneration with premium price in market procuring safe food.
City compost is a good source of carbon and also contains plant nutrient albeit in very small quantities. Compost is organic matter that has been decomposed and recycled as a fertilizer and soil amendment. It is a key ingredient in organic farming. Application of city compost increases the carbon content of soil. Higher carbon content in soil improves both physical and biological properties of the soil. This in turn improves the water retention capacity of soil and also enhances the population of useful microbes in the soil**.** Composting is a natural biological process that reduces the waste stream into a product that can be used as a soil amendment, Healthier plants, composting is practical and convenient, composting saves money and composting is a good alternative to land filling.

Materials and Methods
The study area
The experimental site was located at the Instructional *cum* Research Farm, Department of Agronomy, I.G.K.V. Raipur (C.G.).Raipur is situated in central parts of Chhattisgarh and lies at latitude, longitude and altitude of 21º4′ N, 81º35′ E and 290.20 meters above mean sea level, respectively. The experimental area, (Raipur) comes under the 7th Agro-climatic region of India *i.e.* "Eastern Plateau and Hills" which is classified as sub-humid with hot summer and cold winter. The source of rainfall is S.W. monsoon. It receives an average annual rainfall of 1300-1400 mm, mostly (86%) rainfall during the period of rainy days.

A few showers are expected during winters and occasionally during hot summer months of May. May is the hottest and December is the coolest month of every year. The weekly maximum temperature raised up to 46°C during summer and minimum temperature reaches as low as to 5-6°C during winter season especially in hilly area of Chhattisgarh. The atmospheric relative humidity is relatively high during the months of June - October.

The experiment consisted were laid out with rice-chickpea cropping system, in split plot design with five main plots and three sub plots in three replications. The three test varieties of scented rice are Chhattisgarh Dubraj selection -1, Jawaphool (local scented rice) and TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1) for *kharif*. Chickpea variety JG-130 was taken as test crop during the course of investigations in *Rabi* season. (N_1) No fertilizer, **(**N_2) 75% RDN through city compost + PSB + Azotobacter + BGA, (N_3) 75% RDN through FYM + PSB + Azotobacter + BGA, (N_4) 50% RDN through city compost + 50% RDN through chemical fertilizersand (N_5) 50% RDN through FYM + 50% RDN through chemical fertilizers, where in sub-plotscented rice variety was taken *i.e.* (V_1) Chhattisgarh Dubraj selection-1, (V_2) Jawaphool and (V_3) TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1)

Note: Design: Split plot; RDN: Recommended Dose of Nitrogen (80 kg ha^{-1}); PSB: Phosphate Solublizing Bacteria; BGA: Blue Green Algae; FYM: Farm Yard Manure; CC: City Compost; INM: Integrated Nutrient Management; RN: Residual of Nutrient; Spacing 20 X 10. RDF (80:50:30 N: P_2O_5: K_2O ha^{-1}) the quantity of P_2O_5 and K_2O received from city compost or FYM was adjusted through chemical fertilizers, if required. The 50 and 30 kg P_2O_5 and K_2O ha^{-1} were uniformly applied in all the treatments except control.

Results and Discussion

Effect on growth and yield attributing parameters

The data on growth parameters and yield attributing characters as influenced by different integrated nutrient management are presented in Table 1.

Plant height (cm)

Among the different organic sources city compost with integrated nutrient management the tallest plant at harvest were recorded under 75% RDN through city compost + PSB + Azotobacter + BGA (N_2), however, it was found comparable with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) at all the observation stage during both the years and on mean basis and 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) was found at par during both the years and on mean basis. On the other hand, no fertilizer (N_1) produced the shortest plants height throughout the crop growth period computed on two years mean basis. The variation in plant height due to different organic sources of fertilizers was due to variation in availability of nutrients and their release pattern of nutrients (Rao *et al.,* 2013) [24]. BGA function as a biofertilizer due to the property of nitrogen fixation (Conversion of molecular nitrogen into nitrogen compound). BGA have been reported to promote the nitrogen economy of the soil by converting atmospheric nitrogen into soluble form of ammonia with the help of enzyme nitrogenous complex contained within the specialized structure heterocyst which is ultimately enhances the growth parameters (Ernst *et al*., 1992) [7].

Among various scented rice verities, at all the observational stages the significantly tallest plant height was registered under Jawaphool (V_2). Whereas, it was found at par with Chhattisgarh Dubraj Selection-1 (V_1) at all the observational stages during both the years and on mean basis. Further, TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) produced the shortest plants height throughout the crop growth period on two years mean basis. In case of varieties differences in plant height may be due to their genetic characters and also reported the similar findings by Sarawgi and Sarawgi (2004) [30].

Dry matter accumulation (g $hill^{-1}$)

The treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) produced significantly highest dry matter at all the observational stages from the beginning till harvest on two years mean basis. However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) on two year mean basis and 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) on two years mean basis at 30 and 60 DAT and at 90 DAT during 2017 and 50% RDN through FYM + 50% RDN through chemical fertilizers (N_5) during 2017 at 30 DAT and on mean basis and at 60 DAT only during 2017. Significantly lower dry matter accumulation was recorded from no fertilizer (N_1) at all the growth stages of crop on two years mean basis. The highest dry matter under treatment (N_2) might also be due to the fact that N was applied with blending of city compost and also PSB, Azotobacter and BGA enhanced the water holding capacity by adding polysaccharide material to the soil (Choudhary *et al*., 2007) [2]. and increased the soil aggregation property. BGA have also been reported to excrete growth promoting substances into the soil (Gupta and Shukla, 1969) [8]. which helped in slow release of nutrients and reduced the losses of nutrient during the development stage which helped in production of photosynthates which in turn helped in maximum dry matter accumulation in plant. Murali and Setty (2001) [32] Singh *et al.,* (2001) [32] Jha *et al.,* (2006) [11] Roul *et al.,* (2007) [26] and Netam *et al.* (2008) [20] also reported similar result.

Among various scented rice varieties, at all the observational stages, the significantly highest dry matter accumulation was registered under Jawaphool (V_2). However, it was found at par with Chhattisgarh Dubraj Selection-1 (V_1) on two years mean basis and TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) only during 2017 at 30 DAT. On the other hand, TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) produced the lower dry matter accumulation during 2018 and on mean basis at 30 DAT. At 60 DAT, it was found at par with TCDM-1 Trombay Chhattisgarh Dubraj mutant-1 (V_3) during 2017 and Jawaphool (V_2) only during 2018. On the other hand, Chhattisgarh Dubraj Selection-1 (V_1) during 2017 and TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) produced the lower dry matter accumulation during 2018 and on mean basis at 60 DAT. At 90 DAT it was found at par with Chhattisgarh Dubraj Selection-1 (V_1) during 2018 and on mean basis. Whereas, at harvest during both the years and on mean basis. Further, TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) produced the lower dry matter accumulation at 90 DAT and at harvest on two years mean basis. The increase in dry matter accumulation in Jawaphool (V_2) is due to increase in number of tillers, plant height and genetically inherent character of the varieties. Similar findings were in conformed to Chatiopadhyay *et al.,* (1992) [4] Kumar and

Singh, (2006) [13, 14] Rao *et al.,* (2013) [24] and Roul *et al.,* (2007) [26].

Number of effective tillers (No. m^{-2})

The treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) produced significantly highest number of effective tiller m^{-2} on mean of two years consideration. However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) during 2018 and mean basis and 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) and 50% RDN through FYM + 50% RDN through chemical fertilizers (N_5) only during 2018. Further, no fertilizer (N_1) produced the lowest number of effective tiller m^{-2} during both the years and on mean basis. Increase in plant height, number of tillers in successive growth stages helped in increasing the effective tillers. This was mainly due to higher photosynthetic efficiency and net assimilation, which helped in increasing the overall growth of the plant. Similar trend was also reported by Mandal *et al.,* (2004) [16] Kumar and Singh (2006) [13, 14] and Dahiphale *et al.,* (2004) [5].

Among various scented rice verities, the significantly highest number of effective tiller m^{-2} was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) on two years mean basis, however, it was found comparable with Jawaphool (V_2) only during 2018. Further, variety Chhattisgarh Dubraj Selection-1 (V_1) produced the lowest number of effective tiller m^{-2} on two years mean basis. In case of varieties TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) highest number of effective tiller may be due to their genetic characters with less plant height as compared to others two varieties and also reported the similar findings by Sarawgi and Sarawgi (2004) [30]

Filled grains panicle^{-1} (No.)

The treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) produced significantly highest filled grains panicle^{-1} consideration of two years mean basis. However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) during both the years. Further, no fertilizer (N_1) produced the lowest total number of filled grains panicle^{-1} on two years mean basis. The application of organic sources of fertilizers alone might have helped in improving the nutrient availability for a prolonged period during crop growth and development stages, ultimately it influenced the reproductive stage and resulted in more number of spikelet's and filled grains panicle^{-1}. Similar results have also been obtained by Dahiphale *et al.,* (2004) [5] Sarawgi and Sarawgi (2004) [30] Mandal *et al.* (2004) [16] and Chandrakar *et al.,* (2004) [3] Mhaskar *et al.,* (2005) [17] Paraye *et al.,* (2006) [21] and Lal *et al*., (2009) [15].

Various scented rice varieties, the significantly highest filled grains panicle^{-1} was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) on mean of two year consideration. Whereas, variety Chhattisgarh Dubraj Selection-1 (V_1) produced lowest filled grains panicle^{-1} during 2017 and on mean basis and Jawaphool (V_2) produced lowest total number of grains panicle^{-1} during 2018.

Test weight (g)

The treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) produced significantly highest test weight on two years mean basis. However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3), 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) and 50% RDN through FYM + 50% RDN through chemical fertilizers (N_5) consideration of two years mean basis. Further, no fertilizer (N_1) produced the lowest test weight on two years mean basis. The application of organic sources of fertilizers alone might have helped in improving the nutrient availability for a prolonged period during crop growth and development stages, ultimately it influenced the reproductive stage and resulted in high test weight. Similar results have also been obtained by Dahiphale *et al.,* (2004) [5] Sarawgi and Sarawgi (2004) [30] Mandal *et al.* (2004) [16] and Chandrakar *et al.,* (2004) [3] Mhaskar *et al.,* (2005) [17] Paraye *et al.,* (2006) [21] and Lal *et al*., (2009) [15].

Among various scented rice varieties, the significantly highest test weight was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) during both the years and on mean basis. However, Chhattisgarh Dubraj Selection-1 (V_1) was found at par during both the years and on mean basis. Further, variety Jawaphool (V_2) was found lowest test weight during both the years and on mean basis. Variation for above characters under varieties may be due to their genetic character. Sharma N, (2002) [34] Sarawgi and Sarawgi (2004) [30] Singh *et al.,* (2004) [33] and Netam *et al.,* (2008) [20] have also recorded the similar response.

Effect on yield and harvest index

Grain yield (q ha^{-1})

The treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) produced significantly highest grain yield on two years mean basis (48.35 q ha^{-1}). However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) computed on the basis of two years mean (47.17 q ha^{-1}). Further, no fertilizer (N_1) produced the lowest grain yield on mean of two years consideration (30.55 q ha^{-1}). The increase in yield under (N_2) treatments has been attributed owing to increased growth and yield attributing characters as well. The higher grain and straw yields may be due to the application of organic sources of fertilizers in combination with organic sources of fertilizers *i.e.* PSB, Azotobacter and BGA which resulted to greater availability of essential nutrients to plants, improvement of soil environment which facilitate in better root proliferation leading to higher absorption of water and nutrients and ultimately resulting in higher yield. These results were in agreement with the findings of Morra *et al*., (2010) [19] Rao *et al*., (1998) [29] Pandey *et al.,* (1999) [22] Pandey and Nandeha (2004) [23] Sarawgi and Sarawgi (2004) [30] Jha *et al.,* (2006) [11] Paraye *et al.,* (2006) [21] Sarawgi *et al.,* (2006) [30] Dahuphale and Khandagale (2007) [6] Ganajaxi and Math, (2008) [9] Netam *et al.,* (2008) [20] and Lal *et al.,* (2009) [15]. With the application of BGA the grain yield was found to be increased in the tune of 10 -14 per cent over the control Roger and Kulasooriya (1980) and Roger *et al.* (1980) [27, 28]. also revealed an average increase of 14 per cent in rice yield over the control. This was equivalent to the application of 25-30 kg N ha^{-1} as a biofertilizer (Venkataraman, 1972) [35]. This observation clearly indicates that the application BGA manure can replace the chemical fertilizer (Agawin *et al*., 2007) [1].

Among various scented rice varieties, the significantly highest grain yield was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) on mean of two year consideration (46.27 q ha^{-1}). Whereas, variety Chhattisgarh Dubraj Selection-1 (V_1) produced lowest grain yield on two years mean basis (40.40 q ha^{-1}). The gain yield was significantly higher under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) in comparison others two varieties. The increase in grain yield under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) might be due to genetic characters and higher growth and yield attributing characters *viz.* effective tillers m^{-2}, panicle length, panicle weight, test weight, number of spikelet's $panicle^{-1}$ and number of filled grains $panicle^{-1}$.

Straw yield (q ha^{-1})

The treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) produced significantly highest straw yield on two years mean basis (78.67 q ha^{-1}). However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) (75.79 q ha^{-1}) and 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) (75.32 q ha^{-1}) computed on the basis of two years mean. Further, no fertilizer (N_1) produced the lowest straw yield on two years mean basis (60.85 q ha^{-1}).

Various scented rice varieties, the significantly highest straw yield was recorded under Jawaphool (V_2) on the basis of two years mean (74.15 q ha^{-1}). However, it was found at par under the variety Chhattisgarh Dubraj Selection-1 (V_1) computed on the basis of two years mean (73.56 q ha^{-1}). Further, the lowest straw yield was recorded under variety TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) on two years mean basis (67.76 q ha^{-1}). Higher straw yield was attributed to higher plant height and dry matter accumulation caused by better nutrient absorption from the soil, and the increased rate of metabolic processes, rate of light absorption and photosynthetic activity as well as more number of tillers.

Harvest index (%)

The treatment with 50% RDN through FYM + 50% RDN through chemical fertilizers (N_5) produced significantly highest harvest index on two years mean basis. However, it was found at par with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2), 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) and 50% RDN through city compost + 50% RDN through chemical fertilizers (N_4) computed on the basis of two years mean. Whereas, no fertilizer (N_1) produced the lowest harvest index during both the years and on mean basis.

Among various scented rice varieties, the significantly highest harvest index was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) computed on the basis of two years mean. On the other hand, variety Chhattisgarh Dubraj Selection-1 (V_1) produced lowest harvest index on two years mean basis. Comparatively higher values of HI under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1 (V_3) might be due to fact that relative lower values of straw yield increases the harvest index in respective varieties (Singh *et al.*, 2001) [32].

Cost of cultivation (Rs ha^{-1})

The data on cost of cultivation (Rs ha^{-1}) of scented rice varieties as influenced by integrated nutrient management computed on the basis of two years mean are presented in Table 2.

As regard to integrated nutrient management, highest cost of cultivation (Rs ha^{-1}) of scented rice variety was noted under treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) during both the years and on mean basis. Whereas, the lowest cost of cultivation (Rs ha^{-1}) was noted under no fertilizer (N_1) on mean of two years basis.

Among various scented rice varieties, the cost of cultivation was similar for all the different scented rice varieties on mean of two years consideration.

Gross return (Rs ha^{-1})

As regard to integrated nutrient management, highest gross return (Rs ha^{-1}) of scented rice variety was noted under treatment with 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) on mean of two years consideration. However, it was found at par with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) considered on two years mean basis. Whereas, the lowest gross return (Rs ha^{-1}) was noted under no fertilizer (N_1) during both the years and on mean basis. The higher gross return in (N_2) treatments are obviously due to higher grain and straw yield but it has been less net return and B:C ratio due to comparatively high input cost of city compost.

Among various scented rice varieties, the significantly highest gross return (Rs ha^{-1}) was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1(V_3) on mean of two years consideration. Further, the lowest gross return (Rs ha^{-1}) was recorded under Chhattisgarh Dubraj Selection-1 (V_1) on mean of two years consideration.

Net return (Rs ha^{-1})

As regard to integrated nutrient management, highest net return (Rs ha^{-1}) of scented rice variety was noted under treatment with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) on mean of two years consideration. Further, the lowest net return (Rs ha^{-1}) was noted under no fertilizer (N_1) during both the years and on mean basis. The higher net return and B:C ratio in (N_3) treatments are obviously due to comparatively low input cost of FYM, PSB, Azotobacter and BGA.

Various scented rice varieties, the significantly highest net return (Rs ha^{-1}) was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1(V_3) on mean of two years consideration. Whereas, the lowest net return (Rs ha^{-1}) was recorded under Chhattisgarh Dubraj Selection-1 (V_1) computed on the basis of two years mean.

B: C ration

As regard to integrated nutrient management, highest B:C ratio of scented rice variety was noted under treatment with 75% RDN through FYM + PSB + Azotobacter + BGA (N_3) on the basis of two years mean. Whereas, the lowest B:C ratio was noted under 75% RDN through city compost + PSB + Azotobacter + BGA (N_2) during both the years and on mean basis.

Among various scented rice varieties, the significantly highest B:C ratio was recorded under TCDM-1 Trombay Chhattisgarh Dubraj Mutant-1(V_3) on mean of two years consideration. Further, the lowest B:C ratio was recorded under Chhattisgarh Dubraj Selection-1 (V_1) on mean of two years consideration.

Conclusion

In scented rice, (N_2) 75% RDN through city compost + PSB + Azotobacter + BGA registered significantly highest growth parameters, yield attributes, grain and straw yield, which was comparable with (N_3) 75% RDN through FYM + PSB +Azotobacter + BGA. Among scented varieties, (V_3) TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1) has produced significantly highest growth and yield attributes.

Table 1: Growth, yield attributes and yield of scented rice varieties as influenced by integrated nutrient management (mean of two years)

Treatments		Plant height (cm) at harvest	Dry matter accumulation (g hill^{-1})	Number of effective tillers (m^{-2})	Filled grains / panicle	Test weight (g)	Grain yield (q/ha)	Straw yield (q/ha)	Harvest index (%)
Integrated Nutrient Management									
N_1	No fertilizer	118.5	31.28	326.4	129.1	14.74	30.55	60.85	33.21
N_2	75% RDN through city compost + PSB + Azotobacter + BGA	137.9	39.41	478.9	175.1	18.39	48.35	78.67	38.12
N_3	75% RDN through FYM + PSB + Azotobacter + BGA	131.7	38.39	439.0	170.1	17.81	47.17	75.79	38.41
N_4	50% RDN through city compost + 50% RDN through chemical fertilizers	132.3	36.78	415.5	155.2	17.77	45.05	75.32	37.46
N_5	50% RDN through FYM + 50% RDN through chemical fertilizers	129.1	37.47	420.0	157.9	17.18	43.01	67.98	39.14
SE m±		1.99	0.32	15.07	1.31	0.60	0.58	1.75	0.71
CD (P=0.05)		6.51	1.05	49.16	4.28	1.96	1.90	5.73	2.32
Scented rice varieties									
V_1	Chhattisgarh Dubraj Selection-1	142.6	37.53	393.4	153.2	19.73	40.40	73.56	35.23
V_2	Jawaphool	144.9	38.02	415.5	155.1	11.61	41.69	73.85	36.03
V_3	TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1)	102.1	34.45	439.1	164.1	20.19	46.27	67.76	40.54
SE m±		1.34	0.34	6.34	1.22	0.37	0.44	1.77	0.65
CD (P=0.05)		3.96	1.01	18.71	3.62	1.11	1.31	5.24	1.93

Table 2: Cost of cultivation and economics returns in scented rice variety as influenced by integrated nutrient management during *kharif* 2017 and 2018 (mean of two years)

Treatment		Cost of Cultivation (Rs ha^{-1})	Gross Return (Rs ha^{-1})	Net Return (Rs ha^{-1}) Mean	B:C ratio Mean
Integrated nutrient management					
N_1	No fertilizer	22916	66761	43844	1.91
N_2	75% RDN through city compost + PSB + Azotobacter + BGA	39309	106374	67065	1.71
N_3	75% RDN through FYM + PSB + Azotobacter + BGA	26245	103774	77527	2.95
N_4	50% RDN through city compost + 50% RDN through chemical fertilizers	34709	99121	64412	1.86
N_5	50% RDN through FYM + 50% RDN through chemical fertilizers	26195	94624	68429	2.61
SE m±		-	1281.8	1281.8	0.05
CD (P=0.05)		-	4180.2	4180.2	0.17
Scented rice varieties					
V_1	Chhattisgarh Dubraj selection-1	29875	88881	59005	2.03
V_2	Jawaphool	29875	91712	61837	2.12
V_3	TCDM-1 (Trombay Chhattisgarh Dubraj Mutant-1)	29875	101800	71924	2.47
SE m±		-	982.6	982.6	0.03
CD (P=0.05)		-	2998.8	2998.8	0.09

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