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Effect of integrated nutrient management on yield, soil nutrient status and economics of mango cv. Kesar

ZK Patel, RV Tank, NB Patel and BM Tandel

Abstract
Field experiment entitled was conducted during the years 2020-21 and 2021-22 at Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, (Gujarat). The experiment was laid out in Completely Randomized Design which comprising seven treatments namely, T_1: 100% RDF (NPK+FYM), T_2: 100% NPK soil analysis basis, T_3: T_2 +100 kg FYM tree^{-1}, T_4: 75% RDF + 25% RDN (Biocompost), T_5: 50% RDF + 25% RDN (Biocompost), T_6: 75% RDF + 25% RDN (Neemcake), T_7: 50% RDF + 25% RDN (Neemcake). All the seven treatments were repeated thrice. Full dose of FYM, phosphorus and potassium were applied in the month of June, whereas nitrogen, biocompost and neemcake were given in two equal splits, first half in the month of June and remaining half in the month of February. Biofertilizers (*Azotobacter*, phosphorus solubilizing bacteria and potassium mobilizing bacteria) were applied in the month of February @ 50 ml per tree each in all treatments except T_1. Results showed that application of 100% NPK soil analysis basis + 100 kg FYM tree^{-1} showed maximum physical parameters *viz*., fruit weight (274.85, 302.81 and 288.83 g), fruit length (11.33, 12,37 and 11.82 cm), fruit diameter (7.67, 7.35 and 7.53 cm) and fruit volume (245.31, 273.38 and 259.35 cm^3) as well as yield parameters, highest number of fruits per tree (399.47, 414.93 and 407.20) along with fruit yield (108.11, 119.57 and 113.84 kg tree^{-1}) and (10.81, 11.96 and11.38 t ha^{-1}) during both the years *i.e*., 2020-21, 2021-22 and pooled data, respectively. In case of soil nutrient analysis, available N (261.95, 264.89 and 263.42 kg ha^{-1}), available P (48.33, 52,07 and 50.20 kg ha^{-1}), and available K (367.87, 387.60 and 377.73 kg ha^{1}) were also recorded maximum in the treatment T_3 (100% NPK soil analysis basis + 100 kg FYM tree^{-1}). Maximum soil microbial count *i.e.* 6.6 × 10^9 and 7.9 × 10^9 was recorded with the treatment T_3. From the economic point of view and based on fruit yield per hectare the highest net realization i.e., ₹. 1,97,592 was obtained in the treatment T3 (100% NPK soil analysis basis + 100 kg FYM kg tree^{-1}). Whereas, the maximum benefit cost ratio (2.28) was obtained in the treatment T_4 [75% RDF + 25% RDN (Biocompost)] in mango cv. Kesar.

Keywords: Nutrient management, Neemcake, biocompost, biofertilizers

Introduction

Mango (*Mangifera indica* L.) belongs to family Anacardiaceae has been grown in India since long and is considered as "King of Fruits". It is one of the choicest and most ancient fruits known to mankind. India is the major producer and exporter of mangoes in the world. It is native of Indo-Burma region. The main mango growing states in India are Uttar Pradesh, Andhra Pradesh, Bihar, Karnataka, Gujarat, Maharashtra and Tamil Nadu.

Kesar is India's second mango variety in terms of exports. It is characterized by its golden colour with green overtones. The fruits are medium to large sized (250-325 g per fruit) and oblong in shape. The taste is very good and sugar/acid blend is excellent. The cultivar is free from spongy tissue disorder and malformation. Tree bears excellent quality fruits with saffron coloured pulp when ripe and delicious. Excellent for table purpose fruits with fibreless stone. The Kesar fruit has 18 to 22 ºB TSS, 0.25 to 0.29% acidity and 10.5 to 12.0% total sugars with storability of 15 to 20 days (Chovatiya, *et al.*, 2015) [4].

For sustainable soil productivity, it is very essential to strike a balance in soil biological activity, as any disturbance will affect the nutrient transformation in soil. Therefore, it is necessary to involves the combined use of inorganic, organic and biological sources of essential plant nutrients (INM) to sustain optimum crop yield which improve or maintain the physico-chemical properties of soil. However, indiscriminate application of inorganic fertilizers leads to changes in physical, chemical and biological properties of the soil, besides reducing its fertility and leading to decline in its organic content. Also, use of inorganic carbon fertilizers is detrimental to human health and environment.

Therefore, the present experiment purported to develop an integrated nutrient management package for mango consisting of organic manure, inorganic fertilizers and biofertilizers for improving yield and nutrient status in mango.

Materials and Methods

The experiment was conducted during the years 2020-21 and 2021-22 at Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, (Gujarat). Statistical analysis of the data for various characters studied in present investigation was carried out through the procedure of Completely Randomized Design for individual year and pooled analysis was carried out by taking the year effect in to the subgroup (split) and Analysis of variance was computed by split plot design. All the seven treatments were repeated thrice. Treatment details are, T_1: 100% RDF (NPK+FYM), T_2: 100% NPK soil analysis basis, T_3: T_2 +100 kg FYM tree^{-1}, T_4: 75% RDF + 25% RDN (Biocompost), T_5: 50% RDF + 25% RDN (Biocompost), T_6: 75% RDF + 25% RDN (Neemcake), T_7: 50% RDF + 25% RDN (Neemcake).

The recommended dose of NPK was 750:160:750 g tree^{-1} + 100 kg FYM. Full dose of FYM, phosphorus and potassium were applied in the month of June, whereas nitrogen, biocompost and neemcake were given in two equal splits, first half in the month of June and remaining half in the month of February. Biofertilizers (*Azotobacter*, phosphorus solubilizing bacteria and potassium mobilizing bacteria) were applied in the month of February @ 50 ml per tree each in all treatments except T_1.

Table 1: Initial quantity of nitrogen, phosphorus and potassium content based on soil analysis

Sr. No.	2020-21			2021-22		
	N	P	K	N	P	K
	(kg ha^{-1})			(kg ha^{-1})		
T_2	195.67	30.46	300.26	202.60	34.40	326.73
T_3	254.72	41.82	348.38	261.95	48.33	367.87

Note: Based on the amount of available N, P and K, soil classified as follows:

For available N

Class	Available N (kg ha^{-1})	Fertilizer dose to be applied
Low	<250	Increase RDN by 10%
Medium	250-500	RDN only
High	>500	Decrease RDN by 10%

For available P:

Class	Available P (kg ha^{-1})	Fertilizer dose to be applied
Low	<28	Increase RDP by 10%
Medium	28-50	RDP only
High	>50	Decrease RDP by 10%

For available K

Class	Available K (kg ha^{-1})	Fertilizer dose to be applied
Low	<140	Increase RDK by 10%
Medium	140-280	RDK only
High	>280	Decrease RDK by 10%

For physical parameters, six fruits were randomly selected per treatment per replication and observations were recorded. Among harvested fruits, the weight of the fruits was noted at a time of harvest by using electronic balance. The length and diameter of fruits were measured by using digital vernier calliper. Fruit volume was measured by water displacement method. In yield parameters, number of fruits per tree were counted treatment wise for each experimental tree at the time of harvest. For recording yield, total production per tree was weighed and expressed in kilograms. Fruit yield per hectare was calculated by multiplying the average yield of tree with the total number of trees per hectare. For soil sampling, soil sample was collected after harvest of fruits at 0-30, 30-60 and 60-100 cm depth from 4 pits of all the four directions around the tree with the help of screw auger. Mixing the all soil homogenously and prepared the final sample by discard the one-half soil part. Then the sample was ground with a wooden pestle and sieved through 2 mm sieve and analysed for N, P_2O_5, and K_2O content. The available nitrogen in soil was estimated by the alkaline potassium permanganate method as described by Subbiah and Asija (1956) [27]. The available phosphorus in soil was determined by Olsen's method as described by Olsen *et al.* (1954) [19]. The available potash in soil was determined by Flame Photometer as described by Jackson (1973) [11]. The data recorded on physical parameters, yield parameters and soil nutrient status were analysed statistically (Panse and Sukhatme, 1985) [20].

Results and Discussion

Effect on physical parameters

The effect of integrated nutrient management showed the significant effect on physical parameters. fruit weight (274.85, 302.81 and 288.83 g), fruit length (11.33, 12,37 and 11.82 cm), fruit diameter (6.00, 6.20 and 7.53 cm) and fruit volume (245.31, 273.38 and 259.35 cm^3) were maximum with the application of 100% NPK soil analysis basis + 100 kg FYM tree^{-1} for both the years *i.e.* 2020-21, 2021-22 and pooled data, respectively. (Table 2). Which was closely followed by 75% RDF + 25% RDN (Biocompost). Increase in physical parameters might be due to the increase in morphological traits such as plant height, girth, number of functional leaves, leaf area index, faster rate of leaf production and higher nutrient uptake by the plants. Increased number of leaves might have increased the photosynthetic activity resulting in higher accumulation of carbohydrates. Relatively higher carbohydrates could have promoted the growth rate and in turn increased fruit weight (Kuttimani *et al*., 2013) [16]. This was in accordance with the results of Pattar *et al.* (2018) [23] and Patil and Shinde (2013) [22] in banana, Singh and Banik, (2011) [30] in mango. Increase in fruit length and diameter might be due to higher photosynthetic activity which leads to increase in cell size and intercellular space. Similar findings have been observed by Vishwakarma *et al.* (2017) [29] in bael and Kumar *et al.* (2017) [14] in sweet orange. Fruit volume was significantly higher in treatment T_3 might be due to the mobility of photosynthates from source to sink *i.e.*, higher translocation was possible perhaps due to better sink capacity as indicated by the higher number of fruits per plant and weight of fruit. The results are close related with the findings of Bhalerao *et al.* (2009) [1], Vishwakarma *et al.* (2017) [29] in bael and Kumar *et al.* (2017) [14] in sweet orange.

Biofertilizers also may be attributed to better filling of fruits due to more balanced uptake of nutrients which may have led to better metabolic activities in the plant ultimately lead to high protein and carbohydrate synthesis resulted in fruit weight. Similar findings have been noticed by Cheena *et al.* (2018) [3] in sapota, Kundu *et al.* (2011) [15] in mango, Kumar *et al.* (2019) [13] in pomegranate. It is considered as a significant source of different micronutrients which play an important role in regulation of length and diameter of fruit by enhancing metabolic activities in plant cells (Sharma *et al*., 2013) [24]. This result is in line with Binepal *et al.* 2013 [2] in guava. Biofertilizers helps to continuous supply of nutrients and induction of growth promoting substances which stimulate cell division, cell elongation in fruits during the growth period at rapid rate and ultimately enhance the fruit volume (Binepal *et al.* 2013 in guava) [2].

Table 2: Effect of integrated nutrient management on physical parameters of mango fruits

Treatments	Fruit weight (g)			Fruit length (cm)			Fruit diameter (cm)			Fruit volume (cm^3)		
	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled
T_1	228.72	250.41	239.56	9.68	10.28	9.98	6.00	6.20	6.10	203.10	227.22	215.17
T_2	230.04	257.69	243.86	9.85	10.76	10.35	6.27	6.00	6.12	206.08	230.82	218.45
T_3	274.85	302.81	288.83	11.33	12.37	11.82	7.67	7.35	7.53	245.31	273.38	259.35
T_4	262.46	283.90	273.18	10.89	11.72	11.35	7.40	6.80	7.08	231.66	254.97	243.31
T_5	239.67	274.31	256.99	10.22	11.03	10.63	6.67	6.59	6.63	213.89	243.85	228.87
T_6	255.80	279.64	267.72	10.61	11.37	10.90	6.74	6.69	6.72	217.81	250.83	234.32
T_7	238.91	266.42	252.67	9.97	10.69	10.40	6.53	6.59	6.55	209.79	231.14	220.46
SEm ±	10.02	10.19	7.72	0.36	0.41	0.29	0.30	0.25	0.18	8.83	9.70	5.40
CD at 5%	30.39	30.92	23.42	1.07	1.23	0.88	0.90	0.77	0.53	26.79	29.43	16.37
CV_1%	7.02	6.45	7.26	7.03	6.29	6.63	7.63	6.63	6.44	7.01	6.87	5.71
Year (Y): SEm ±			3.48	Year (Y): SEm ±		0.05	Year (Y): SEm ±		0.11	Year (Y): SEm ±		4.04
Y: CD at 5%			10.56	Y: CD at 5%		0.16	Y: CD at 5%		NS	Y: CD at 5%		12.24
CV_2 (%)			6.13	CV_2 (%)		7.88	CV_2 (%)		7.77	CV_2 (%)		7.99
YT: SEm ±			10.10	YT: SEm ±		0.31	YT: SEm ±		0.28	YT: SEm ±		9.28
YT: CD at 5%			NS	YT: CD at 5%		NS	YT: CD at 5%		NS	YT: CD at 5%		NS

Effect on yield parameters

Yield parameters, *viz* number of fruits per tree, yield (kg ha^{-1} and t ha^{-1}) were significantly influenced by the treatments (Table 3). However, T_3 showed the highest number of fruits per tree (399.47, 414.93 and 407.20) for both the years *i.e.* 2020-21, 2021-22 and pooled data, respectively. Which was at par with the treatment T_4 might be due to the fact that, there was increase in level of nutrient in assimilating area of crop due to which the rate of dry matter production was enhanced. Similarly, due to rational partitioning of dry matter to economic sink. It also might be due to solubilisation effect of plant nutrients by addition of FYM, as it enhances the uptake of N, P, K, Ca and Mg by the plant during different development phases. The above results are in conformity with the finding of Dalal *et al.* (2004) [5] in citrus, Cheena *et al.* (2018) [3] in sapota and Gajbhiye *et al.* (2020) [9] in pomegranate. Fruits yield was also found maximum (108.11, 119.57 and 113.84 kg $tree^{-1}$) and (10.81, 11.96 and 11.38 t ha^{-1}) with the application of 100% NPK soil analysis basis + 100 kg FYM $tree^{-1}$ (T_3) for both the years *i.e.* 2020-21, 2021-22 and pooled data, respectively. It was realized due to increase in fruit number and fruit weight per plant. Fruit yield increased by better availability and uptake of nutrients by plant roots and enhancing the source-sink relationship by increasing the movement of carbohydrates from the leaves to the fruits. The role of nitrogen and potassium in the functioning of chlorophyll is well established. This may increase chlorophyll content in leaves indicates the efficiency of photosynthesis, where the solar energy is converted into chemical energy. N, P and K were utilized efficiently by the plant, which resulted in producing maximum photosynthetic in terms of high biomass and trans-locating the assimilated materials to the developing sink. This is in confirmation with the findings of Cheena *et al.* (2018) [3] in sapota, Kumar *et al.* (2017) [14] in sweet orange and Gajbhiye *et al.* (2020) [9] in pomegranate.

Table 3: Effect of integrated nutrient management on yield parameters of mango fruits

Treatments	Number of fruits per tree			Yield (kg $tree^{-1}$)			Yield (t ha^{-1})		
	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled
T_1	322.13	325.93	324.03	81.77	81.83	81.80	8.18	8.18	8.18
T_2	328.20	341.87	335.03	84.49	87.61	86.06	8.45	8.76	8.61
T_3	399.47	414.93	407.20	108.11	119.57	113.84	10.81	11.96	11.38
T_4	380.33	391.67	386.00	99.82	112.04	105.92	9.98	11.20	10.59
T_5	341.93	360.33	351.13	83.69	98.90	91.30	8.37	9.89	9.13
T_6	356.67	375.27	365.97	87.90	106.68	97.30	8.79	10.67	9.73
T_7	328.53	353.60	341.07	81.93	92.28	87.12	8.19	9.23	8.71
SEm ±	11.23	11.26	8.63	3.74	4.19	2.89	0.37	0.42	0.29
CD at 5%	34.06	34.16	26.19	11.33	12.70	8.76	1.13	1.27	0.88
CV_1%	5.54	5.33	5.90	7.22	7.27	7.46	7.22	7.27	7.49
Year (Y): SEm ±			3.85	Year (Y): SEm ±		1.46	Year (Y): SEm ±		0.15
Y: CD at 5%			11.68	Y: CD at 5%		4.43	Y: CD at 5%		0.45
CV_2 (%)			4.92	CV_2 (%)		7.05	CV_2 (%)		7.09
YT: SEm ±			11.25	YT: SEm ±		3.97	YT: SEm ±		0.40
YT: CD at 5%			NS	YT: CD at 5%		NS	YT: CD at 5%		NS

Biofertilizers supply all the nutrient in adequate amount starting from initial development stage to harvesting stage, which results into more retention of fruits by supply of photosynthates at critical requirement stage which helps to incense the number of fruits. These results are similar to the findings of Kumar *et al.* (2019) [13] in pomegranate and Binepal *et al.* 2013 [2] in guava. An increase in fruit yield per tree through biofertilizers might be due to the fact that it increased continuous supply of nutrients which stimulated cell division, cell elongation and increased the number of fruits. This might be attributed due to it improved fertilizer use efficiency with application of organic sources of nutrients and biofertilizers also helped in increasing fruit volume, diameter and weight ultimately the fruit yield per tree was obtained maximum. The above results are in conformity with the finding of Binepal *et al.* 2013 [2] in guava, Kundu *et al.* (2011) [15] in mango, Kumar *et al.* (2019) [13] in pomegranate.

Effect on soil nutrient status

Variation in available N, available P and available K were significant among the treatments. It is clear from the table 4 that the maximum available N (261.95, 264.89 and 263.42 kg ha^{-1}), available P (48.33, 52,07 and 50.20 kg ha^{-1}) and available K (367.87, 387.60 and 377.73 kg ha^{1}) were also recorded maximum in the treatment T_3 (100% NPK soil analysis basis + 100 kg FYM $tree^{-1}$) for both the years *i.e.* 2020-21, 2021-22 and pooled data, respectively. Which was at par with the treatment T_4. Increase in available nitrogen might be due to the better response of addition of organic matter (FYM) which improved the nitrogen status of soil can be a scribed to its slow decomposition producing humic acid and amino acids which increases nitrogen availability. These findings are in agreement with the results of Sharma *et al.* (2017) [25] in custard apple and Meena *et al.* (2018) [17] in pomegranate. Higher availability of phosphorus in the treatment T_3 might be due to the release of organic acids from organic manures during microbial decomposition of organic matter which might have helped in the solubility of native phosphorus and thereby increase the phosphorus availability (Patel, 2008). In addition, the organic anions compete with phosphate ions for the binding sites on the soil particles. The complex organic anions chelate Al^{3+}, Fe^{3+} and Ca^{2+} and thus decrease the phosphate precipitating power of these cations and thereby increase the phosphorus availability. Similar findings were also reported by Tandel *et al.* (2017) [28] in papaya, Sharma *et al.* (2017) [25] in custard apple and Ganapathi and Dharmatti (2018) [10] in banana. The higher K_2O content in treatment T_3 might be due to the organic and inorganic acids produced during decomposition of organic manures helping to release of minerally bound insoluble potassium and also might had reduced the potassium fixation. The build-up of available potassium in soil was due to the beneficial effect of organic manures in releasing potassium due to the interaction of organic matter with clay and direct addition of potassium to the available pool of soil (Shivakumar, 2010) [26]. Similar results are in agreement with Tandel *et al.* (2017) [28].

Table 4: Effect of integrated nutrient management on soil nutrient status from the soil after harvesting of mango fruits

Treatments	Available N (kg ha^{-1})			Available P (kg ha^{-1})			Available K (kg ha^{-1})		
	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled	2020-21	2021-22	Pooled
T_1	198.07	202.53	200.30	33.07	38.13	35.60	302.93	320.30	311.62
T_2	202.60	211.93	207.27	34.40	40.40	37.40	326.73	328.07	327.40
T_3	261.95	264.89	263.42	48.33	52.07	50.20	367.87	387.60	377.73
T_4	248.00	244.87	246.43	45.93	48.13	47.03	347.87	354.99	351.43
T_5	213.20	228.07	220.63	39.20	42.13	40.67	335.93	347.60	341.77
T_6	236.00	241.33	238.67	44.27	45.80	45.03	341.40	354.47	347.93
T_7	214.33	221.73	218.03	37.80	43.80	40.80	333.07	345.80	339.43
SEm ±	8.90	8.54	7.65	1.43	1.90	1.45	9.78	11.36	7.17
CD at 5%	27.01	25.90	23.19	4.34	5.76	4.39	29.68	34.45	21.76
CV_1%	6.86	6.41	8.22	6.13	7.41	8.37	5.04	5.65	5.13
Year (Y): SEm ±			2.25	Year (Y): SEm ±		0.46	Year (Y): SEm ±		4.17
Y: CD at 5%			NS	Y: CD at 5%		1.38	Y: CD at 5%		NS
CV_2 (%)			4.52	CV_2 (%)		4.39	CV_2 (%)		5.58
YT: SEm ±			8.72	YT: SEm ±		1.86	YT: SEm ±		10.60
YT: CD at 5%			NS	YT: CD at 5%		NS	YT: CD at 5%		NS

Biofertilizer helps in mineralization of nitrogen from organic manures in soil and high rate of multiplication of soil microbes which could convert organically bound nitrogen to inorganic form. Phosphate solubilising bacteria increase the availability of P_2O_5 that solubilise the insoluble forms of phosphorus and make them available to the plants. The mechanism of stabilization appears to be acid metal reaction and thus dissolution and chelation of metal and release of phosphorus bacteria (Dey *et al.* 2005) [6]. Potassium Mobilizing Bacteria (KSB) enhance the availability of K_2O might be due to the fact that it can solubilize K bearing minerals and convert the insoluble K to soluble forms of K available to plant uptake through production of organic and inorganic acids (Etesami *et al.* 2017) [8]. These results are in agreement with Meena *et al.* (2018) [17] in pomegranate.

Effect on microbial count

The data clearly indicated that the treatment T_3 (100% NPK soil analysis basis +100 kg FYM kg $tree^{-1}$) recorded maximum microbial count *i.e.* 6.6×10^9 and 7.9×10^9 in soil which was followed by T_4 and T_6 (Table 5). higher soil bacteria were observed from the soil treated with INM treatment and biofertilizers. INM treatment and biofertilizers were increased the biological activities, promotes mycorrhiza symbiosis that sequentially improved the beneficial microorganism. This result was supported by Dutta *et al.* (2016) [7] in mango and Kour *et al.* (2019) [12] in aonla and Meena *et al.* (2019) [18] in sapota.

Table 5: Effect of integrated nutrient management on microbial count of soil

Treatments	Season 1	Season 2
Initial	4.2×10^7	5.4×10^7
T_1: 100% RDF (FYM+NPK)	4.3×10^8	5.6×10^8
T_2: 100% NPK soil analysis basis	5.2×10^8	6.2×10^8
T_3: T_2+100 kg FYM tree^{-1}	6.6×10^9	7.9×10^9
T_4: 75% RDF + 25% RDN (Biocompost)	6.3×10^9	7.6×10^9
T_5: 50% RDF + 25% RDN (Biocompost)	6.0×10^9	7.0×10^9
T_6: 75% RDF + 25% RDN (Neemcake)	6.1×10^9	7.1×10^9
T_7: 50% RDF + 25% RDN (Neemcake)	5.9×10^8	6.6×10^8

Effect on economics

Among the different treatments, the highest net realization *i.e.*, ₹. 1,97,592 was obtained in the treatment T_3 *i.e.* 100% NPK soil analysis basis + 100 kg FYM kg tree^{-1} which was closely followed by T_4 [75% RDF + 25% RDN (Biocompost)]. However, the maximum benefit cost ratio (2.28) was recorded in the treatment T_4 which was followed by treatment T_3 (Table 5).

Table 5: Effect of integrated nutrient management on economics of mango

Treatments	Marketable yield (kg ha^{-1})	Cost of cultivation	Treatment Cost	Harvesting Cost	Total Cost (₹ ha^{-1})	Gross realization (₹ ha^{-1})	Net realization (₹ ha^{-1})	B:C ratio
	(1)	(2)	(3)	(4)	(5) (2+3+4)	(6)	(7) (6-5)	(8) (7/5)
T_1	8180	53267	12110	8180	73557	204500	130943	1.78
T_2	8605	54038	12564	8605	75207	215125	139918	1.86
T_3	11383	59136	16463	11383	86983	284575	197592	2.27
T_4	10593	57499	12690	10593	80782	264825	184043	2.28
T_5	9129	54874	11494	9129	75498	228225	152727	2.02
T_6	9728	56463	19330	9728	85521	243200	157679	1.84
T_7	8710	54611	18134	8710	81456	217750	136294	1.67

Conclusions

From the two years of field study, it can be concluded that by the soil application of 100% NPK soil analysis basis + 100 kg FYM kg tree^{-1} can increased physical parameters and yield contributing parameters of mango cv. Kesar. This treatment has also increased soil nutrient status along with microbial count of the soil. From the economic point of view, maximum net realization was obtained with T_3 (100% NPK soil analysis basis + 100 kg FYM kg tree^{-1}). However, T_4 [75% RDF + 25% RDN (Biocompost)] also stood statistically equivalent with T_3 in most of the parameters and recorded maximum benefit cost ratio.

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