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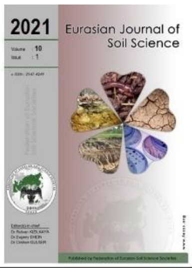

Effects of nutrient enriched municipal solid waste compost on soil fertility, crop yield and nutrient content in brinjal

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Abstract

Composting is a good option of solid waste recycling, but its use by the farmers is limited because of its low nutrient status. Our study has considered organic amendments to increase nutrient status of MSW compost. We prepared three types of amended compost by mixing 20% mustard oil cake (MOC) and 30% poultry manure (PM) or cowdung (CD) or sugarcane press mud (SPM) with 50% MSW compost. *Trichoderma viridi inoculum* was used to accelerate the composting process. Different amendments improved the nutrient level of MSW compost. A field experiment was conducted to measure the performances of amended MSW composts alone and with fertilizers on yield and nutrient content of brinjal (*Solanum melongena*) and soil fertility. The experiment was carried out at Bangladesh Agricultural University research farm having silt loam texture, 6.7 pH and 2.79% organic matter; the soil was Aeric Haplaquept under the order Inceptisols. There were 10 treatments consisting of chemical fertilizers (urea, TSP, MoP, gypsum & zinc sulphate) and four types of MSW compost (3 enriched and 1 unenriched). The nutrient status of soil had increased due to application of composts. Based on the results of fruit (edible portion) yield and N, P, K and S concentrations of brinjal, and soil nutrient availability, the mixture 50% fertilizers +10 t ha^{-1} of enriched compost (MSW + MOC + SPM in a ratio of 5:2:3) was found as the best treatment. Results of this study have significant value in fertilizer management strategies for brinjal cultivation in sub-tropical countries.

Keywords: Brinjal, MSW compost, mustard oil cake, poultry manure, sugarcane press mud.

Introduction

Brinjal (*Solanum melongena*), also known as eggplant and aubergine, is grown worldwide and used as a vegetable. It is a high-fiber, low-calorie food that is rich in nutrients, with many health benefits include reducing the risk of heart disease, control of blood sugar and weight loss (Gürbüz et al., 2018; Naeem and Ugur, 2019). It is a simple and delicious addition to any healthy diet.

Fertilizer is a major input in crop production. To reduce fertilizer cost, environmental degradation and restore soil fertility, the use of organic amendment has a significant value. To achieve agricultural sustainability, the use of organic amendment has achieved prime importance in recent years, particularly under intensive cropping system in tropical and sub-tropical countries.

Composting of municipal solid waste (MSW) has recently gained good attention from the point of protection of environmental degradation, saving of land filling area, cost of incineration and scope of its use for crop

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production (Sultana, 2020). However, the use of MSW compost is limited since MSW compost is generally poor in essential plant nutrients and the crops do not respond to its exclusive addition. For this reason, the crop farmers mostly rely on chemical fertilizers for higher crop yield without or with less use of compost.

An opportunity exists to enhance the nutrient value of compost by addition of some organic amendments viz. green manure, cowdung and mustard oil cake (Torkashvand, 2010). MSW compost amendment may result in a significant enhancement of heavy metal loadings in the amended top soils. As reported by Achiba et al. (2009), a 5-year application of MSW compost increased the organic matter and N content, while increasing the heavy metal concentration in the soil. Thus, mixing of some organic materials (e.g. mustard oil cake, poultry manure, sugar press mud) with MSW compost would increase the nutrient value and decrease the heavy metal contents due to dilution for addition of amendments the heavy metals (e.g. Pb, Cd, Ni) concentration of MSW compost. Thus, some organic materials such as mustard oil cake, poultry manure, sugarcane press mud could be appropriate materials for the production of nutrient enriched MSW compost with lesser impact to the environment, lower in cost operation and reduction in the weight of compost easily transportable to the farmer's field.

Nevertheless, single manure or fertilizer can't sustain soil health and crop yield. Thus, an integrated approach with combined use of compost and fertilizers is important. The benefits of integrated use of compost and fertilizers in terms of improvement of crop yield, crop quality and soil fertility are widely reported (Kavitha and Subramanian, 2007; Jahiruddin et al., 2012; Bilkis, 2015; Kanton et al., 2016; Youssef and Eissa, 2017; Aktar et al., 2018). Sustainable agriculture requires use of organic fertilizers for steady nutrients supply and improving soil organic matter, soil physical and chemical properties and crop productivity (Rekaby et al., 2020). Soil organic matter influences on the processes occurring in the soil (Gülser and Candemir, 2012; Cercioğlu et al., 2014).

The present study aimed at nutrient enrichment of MSW compost using locally available nutrient rich materials in a suitable proportion and evaluating the influence of nutrient enriched MSW compost on soil fertility, fruit yield and nutrient content in brinjal.

Material and Methods

Production of nutrient enriched MSW compost

MSW compost was collected from the Mymensingh Eco Park where an NGO, Gramaus (Grameen Manobic Unnayan Sangstha), produces compost from solid wastes of the Mymensingh City, Bangladesh. MSW compost was mixed with four different types of organic materials in a suitable proportion to upgrade the nutrient level of MSW compost. Mustard oil cake (MOC), poultry manure (PM), cowdung (CD) and sugarcane press mud (SPM) were used as amended materials. These five organics were analyzed for N, P, K and S contents; the results being shown in Table 1.

Table 1. Nutrient status of MSW compost, mustard oil cake, cowdung, poultry manure and sugar press mud

Organic material	% N	%P	%K	%S
MSW compost	1.14	0.23	0.87	0.27
Mustard oil cake	4.70	1.06	0.91	0.93
Cowdung	1.07	0.57	0.54	0.32
Poultry manure	1.33	0.80	0.89	0.42
Sugarcane press mud	1.59	0.09	0.64	0.51

The N, P, K and S levels in four different types of amended compost are given in Table 2. *Trichoderma* was used for every MSW compost treatment (T_3 – T_{10}) in order to accelerate composting process (AyanfeOluwa et al., 2017). *T. viridi* inoculum was added to the amended and unamended MSW compost at a rate of 1 litre broth (liquid media) per ton compost, the fungal count being 10^6 cfu mL^{-1}. The concentration of N and P in the amended MSW compost had manifold increased over unamended MSW compost. The procedure for determining nutrient contents of different organic materials and MSW composts is stated in nutrient analysis section under field experiment.

Table 2. Nutrient level of different types of compost

Types compost	%N	%P	%K	%S
Compost 1	1.41	0.33	1.01	0.41
Compost 2	3.14	0.84	0.84	0.52
Compost 3	2.91	0.62	0.77	0.45
Compost 4	3.22	0.40	0.81	0.32

Compost 1 = MSW 100%; Compost 2 = MSW 50% + MOC 20% + PM 30%; Compost 3 = MSW 50% + MOC 20% + CD 30%; Compost 4 = MSW 50% + MOC 20% + SPM 30% .

Field experiment

Location and site

The field trial with rice was conducted at Bangladesh Agricultural University (BAU) research farm, Mymensingh (24°56.11' N, 89°55.54′ E) which belongs to Old Brahmaputra Floodplain (FAO/UNDP, 1988) with non-calcareous dark grey floodplain soil characteristics. According to US Soil Taxonomy, the soil is Aeric Haplaquept under the Order Inceptisols and as per FAO Soil Unit it is Chromic-Eutric Gleysols. The location has a subtropical humid climate and is characterized by hot and humid summer and cold winter. The research field was medium high land.

Soil characteristics

The soil (0-15 cm) was silt loam (14% sand, 70% silt and16% clay) having 6.7 pH (water), 2.79% organic matter (Nelson and Sommers, 1982), 0.17% Kjeldahl N (Bremner and Mulvaney, 1982), 4.1 mg kg^{-1} Olsen P (Olsen and Sommers, 1982), 0.089 cmol (+) kg^{-1} NH_4OAc extractable K (Knudsen et al.,1982), 17.1mg kg^{-1} $CaCl_2$ extractable S (Fox et al., 1964), 0.65 mg kg^{-1} DTPA extractable Zn (Lindsay and Norvell, 1978) and 0.24 mg kg^{-1} $Ca(H_2PO_4)_2$ extractable B (Bingham, 1982).

Treatments and design

There were 10 treatments with different combinations of chemical fertilizers (urea, TSP, MoP, gypsum and $ZnSO_4.7H_2O$) and four types of compost. *Trichoderma* inoculum was added to the MSW compost one month ahead of its field application. The details of the treatments are depicted in Table 3. The aim of the experiments was to reduce the use of chemical fertilizers by 50% through supplementing with MSW compost (50%) + MOC (20%) + PM/CD/SPM (30%). Amount of nutrient addition through fertilizers and compost is given in Table 3. The 100% fertilizer dose for urea, TSP, MoP and gypsum was 300, 180, 210 and 80, respectively. The experiment was laid out in a randomized complete block design (RCBD), with three replications.

Table 3. Nutrient addition through fertilizers and compost (kg ha^{-1})

Treatments	N		P		K		S	
	CF	compost	CF	Compost	CF	Compost	CF	Compost
T_1 : Control	0	0	0	0	0	0	0	0
T_2 : 100% CF	135	0	36	0	105	0	15	0
T_3 : Compost 1	0	71	0	33	0	101	0	41
T_4 : Compost 2	0	157	0	84	0	84	0	52
T_5 : Compost 3	0	146	0	62	0	77	0	45
T_6 : Compost 4	0	161	0	40	0	81	0	32
T_7 : 50% CF + T_3	68	71	18	33	53	101	8	41
T_8 : 50% CF + T_4	68	157	18	84	53	84	8	52
T_9 : 50% CF + T_5	68	146	18	62	53	77	8	45
T_{10} : 50% CF + T_6	68	161	18	40	53	81	8	32

Compost 1 =MSW 100%; Compost 2 =MSW 50% + MOC 20% + PM 30%; Compost 3 =MSW 50% + MOC 20% + CD 30%; Compost 4 = MSW 50% + MOC 20% + SPM 30%

CF = Chemical fertilizer, MSW = Municipal solid waste, MOC = Mustard oil cake, PM = Poultry manure, CD = Cowdung, SPM = Sugar press mud

50% N mineralization from compost during one crop season

Crop management

The plots received nutrient enriched compost and/or fertilizers as per treatments. Fertilizers such as urea, TSP, MoP and gypsum were used as sources of N, P, K and S, respectively. The one-third dose of urea and the full dose of all other fertilizers were applied as basal to the individual plots after layout preparation. The second split of urea was applied after 30 days of planting and the third split was after 60 days.

The seedlings of brinjal (var. BARI begun1) were transplanted on 12 November 2017 with a spacing of 80cm × 60cm. After transplanting, the field was irrigated to ensure better seedling establishment. The second irrigation was given 20 days after transplanting. The crop generally needed irrigation once a weak depending on the soil moisture condition. Weeds were managed by two hand-weeding at 15 and 30 DAS. Plant protection measures viz. insecticide and fungicide spray were done to keep the crop free from any insect and pathogen attack. Fruits were picked up when they attained maturity and the weight was recorded. Various growth and yield characters of the crop for each plot were recorded. The characters included plant height (cm), number of branches plant^{-1}, fruit length (cm), fruit diameter (cm), number of fruits plant^{-1}, individual fruit weight and fruit yield (kg plot^{-1}, then converted to t ha^{-1}). The fruits from every plot were chemically analyzed for N, P, K and S concentrations.

Nutrient analysis

For N determination, H_2SO_4 digestion (Kjeldahl method) and for P, K and S determination HNO_3-H_2O_2 digestion procedures were followed (Page et al., 1982). The amount of N, P, K and S in the acid digest was measured by the methods as used for soil analysis. Nitrogen in the digest was estimated by distillation with 10N NaOH followed by titration of the distillate trapped in H_3BO_3 indicator solution with 0.01N H_2SO_4 (Bremner and Mulvaney, 1982). The K concentration in the acid digest was determined by flame photometer. The amount of P in the digest was determined colorimetrically and the S determined turbidmetriclly, as indicated in the soil characteristics section.

Statistical analysis

All the data (plant growth, yield, yield components, fruit nutrient contents and soil analysis after harvest) were statistically analyzed by "R", version 3.4.3 software. The analysis of variance for every parameter was performed by F-test and mean comparisons of the treatments were done by Duncan's Multiple Range test (DMRT), where $P<0.05$ was considered as the threshold value for significance (Gomez and Gomez, 1984).

Results and Discussion

The growth and yield components, fruit yield, nutrient concentrations, and changes in soil properties were examined as the treatment effects.

Crop yield

The fruit yield of brinjal due to different treatments varied from 6.6 – 59.7 t ha^{-1}, showing that neither fertilizers nor compost alone produced better yield, their combined use resulted in better yield (Figure 1). The T_{10} treatment comprising 50% fertilizers + compost 4 (MSW + MOC + sugar press mud in a ratio of 5:2:3) demonstrated the best fruit yield. The highest yield was not statistically different from that obtained with T_6, T_8 and T_9 treatments, but they all showed their superiority over T_1 – T_5 and T_7 treatments. The results are clearly indicative of the benefits of the integrated use of compost and fertilizers. About 50% reduction of chemical fertilizers is possible through the use of organic fertilizers. The control receiving neither fertilizer nor compost (T_1) recorded the lowest fruit yield. The yield benefits due to compost with and without fertilizers were 2.9 – 60.1% over exclusive fertilizer application.

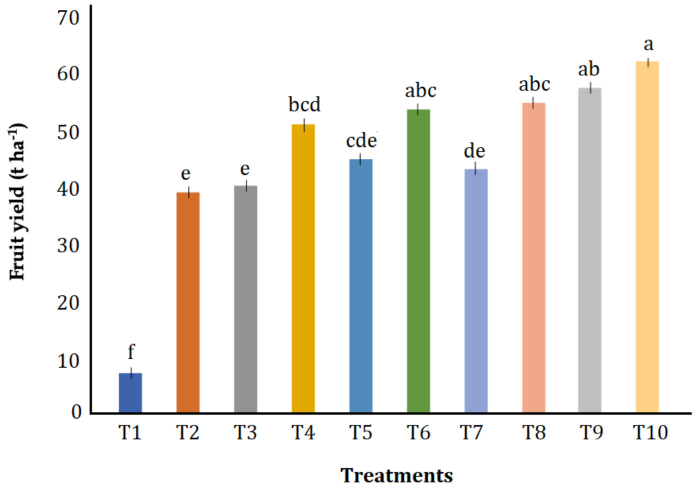

Figure 1. Effects of compost and fertilizer treatments on the fruit yield of brinjal
[Treatment details are given in Table 3]

The press mud based fertilizer-compost treatment (T_{10}) performed the highest yield (59.7 t ha^{-1}) which could be due to its higher nitrogen content (3.52%N, 161 kg N ha^{-1} addition, Tables 2, 3) and also could be higher capacity of this compost to increase the availability of native soil nutrients through higher biological activity (Pengthamkeerati et al., 2011). As stated by Eghball et al. (2002), manure having higher total N content had more N readily available for crops. The positive effects of integrated application of chemical fertilizers and manure or compost are reported on other solanaceous crops, as in potato (*Solanum tuberosum*) (Parmar et al., 2007; Kumar et al., 2012; Islam et al., 2013; Haque, 2014) and tomato (*Solanum lycopersicum*) (Rodge and Yadlod, 2009; Singh et al., 2013).

Growth and yield parameters

The growth and yield contributing characters such as plant height ranged from 61.2 - 84.5 cm, number of branches plant^{-1} from 14.3 - 34.3, fruit length 6.44 - 9.08 cm, fruit diameter 3.9 - 5.48 cm, number of fruits plant^{-1} 22.3 - 80.3 and individual fruit weight 210 - 470 g over the treatments (Table 4). For all parameters, the fertilizer-compost combined treatments exhibited better performances and of them, the T_{10} treatment which contained 50% dose of chemical fertilizers and compost type 4 (50% MSW + 20% MOC + 30% SPM) showed the highest performances.

Table 4. Effects of different compost and fertilizer treatments on the growth and yield contributing characters of brinjal (cv. BARI begun 1)

Treatments	Plant height (cm)	No. of branches plant^{-1}	Fruit length (cm)	Fruit diameter (cm)	No. of fruits plant^{-1}	Individual fruit wt. (kg)
T_1 : Control	61.2d	14.3d	6.44d	3.91d	22.3f	0.021c
T_2 : 100% CF	75.5ab	30.5ab	8.29abc	4.92bc	56.3de	0.045a
T_3 : Compost 1	64.2cd	19.7cd	7.40cd	4.59c	49.0e	0.041b
T_4 : Compost 2	77.9ab	21.2cd	8.01bc	4.89bc	62.0cd	0.047a
T_5 : Compost 3	70.3bcd	34.3a	8.20abc	4.90bc	70.3bc	0.042b
T_6 : Compost 4	73.5bc	25.2bc	8.30abc	4.99abc	70.3bc	0.042b
T_7 : 50% CF + T_3	75.5ab	30.0ab	7.92bc	4.87bc	58.3d	0.044ab
T_8 : 50% CF + T_4	84.5a	34.2a	8.44ab	5.27ab	74.3ab	0.043ab
T_9 : 50% CF + T_5	79.5ab	34.3a	8.51ab	4.90bc	76.3ab	0.044ab
T_{10} : 50% CF + T_6	78.5ab	30.7ab	9.08a	5.48a	80.3a	0.046a
Level of sig.	*	**	*	*	**	**
CV (%)	7.70	8.34	7.20	6.49	6.76	5.53
SE (±)	1.16	1.02	0.47	0.25	0.89	0.004

Compost 1= MSW 100%; Compost 2 = MSW 50% + MOC 20% + PM 30%; Compost 3 =MSW 50% + MOC 20% + CD 30%; Compost 4 = MSW 50% + MOC 20% + SPM 30% .
SE (±) = Standard error of means, CV= Coefficient of variation; *, $P < 0.05$; **, $P < 0.01$
In a column, the means followed by the same letters are not significantly different at 5% level by DMRT.

The yield of a crop is a complex character which is influenced by several component crop characters. Thus, the increase in fruit yield can be attributed to the increase in yield attributes as evidenced by a good correlation of fruit yield with plant height ($r=0.798$; $P < 0.01$), number of branches plant^{-1} ($r=0.680$; $P < 0.05$), fruit length ($r=0.925$; $P < 0.001$), fruit diameter ($r=0.923$; $P < 0.001$), number of fruits plant -1 ($r=0.966$; $P < 0.001$) and individual fruit weight ($r=0.892$; $P < 0.001$).

Nutrient concentrations of rice grain and straw

The N, P, K and S concentrations of brinjal fruit were significantly influenced by the different treatments (Table 5). The N concentration of brinjal varied from 0.097-0.412% (0.606 – 2.58 % protein, calculated as %N × 6.25) across the treatments. The T_2 treatment (sole fertilizer) showed the highest fruit N concentration, which was statistically similar to that observed with T_4, T_6 and T_{10} treatments. The P, K and S concentrations of brinjal across the treatments ranged from 0.017-0.066%, 0.012-0.050% and 0.015-0.036%, respectively. For P concentration T_4 treatment, for K concentration, the T_9 treatment and for S concentration T_{10} gave the displayed results. The T_1 treatment, i.e. control treatment always showed the lowest brinjal N, P, K and S concentrations. As reported by Rekaby et al. (2020), organic amendment with biochar, humic acid or compost increased the nutrient uptake by barley plants and influenced the chlorophyll synthesis in plant tissues.

Table 5. Effects of compost and fertilizer treatments on N, P, K and S concentrations of brinjal (cv. BARI begun 1)

Treatments	N (%)	P (%)	K (%)	S (%)
T_1 : Control	0.097 d	0.017 c	0.012 g	0.015 b
T_2 : 100% CF	0.412 a	0.065 a	0.025 f	0.035 a
T_3 : Compost 1	0.291 bc	0.064 a	0.028 e	0.033 a
T_4 : Compost 2	0.354 ab	0.066 a	0.035 d	0.035 a
T_5 : Compost 3	0.314 bc	0.051 b	0.043 b	0.030 a
T_6 : Compost 4	0.331 abc	0.058 ab	0.039 c	0.031 a
T_7 : 50% CF + T_3	0.314 bc	0.048 b	0.045 b	0.031 a
T_8 : 50% CF + T_4	0.256 bc	0.047 b	0.049 a	0.031 a
T_9 : 50% CF + T_5	0.291 bc	0.047 b	0.050 a	0.032 a
T_{10} : 50% CF + T_6	0.363 ab	0.056 ab	0.049 a	0.036 a
Significance	*	**	**	**
CV (%)	7.74	5.17	4.44	6.20
SE (±)	1.37	0.093	0.096	0.089

Compost 1= MSW 100% ; Compost 2= MSW 50% + MOC 20% + PM 30%; Compost 3=MSW 50% + MOC 20% + CD 30%; Compost 4 = MSW 50% + MOC 20% + SPM 30% .
SE (±) = Standard error of means, CV= Coefficient of variation; *, $P < 0.05$; **, $P < 0.01$
In a column, the means followed by the same letters are not significantly different at 5% level by DMRT.

There was a significant positive correlation between fruit N with other nutrient concentrations, strongly with P (r=0.0.904, P<0.001) and S (r=927, P<0.001) and weakly with K (r=0.427, P<0.20). Plants maintain a reasonably constant nutrient ratio in its body. In the present study, we found a N:P ratio of 5.4-6.5 (mean 5.8), N:K ratio of 7.0-10.4 (mean 8.6) and N:S ratio of 8.8-10.7 (mean 9.6) in brinjal fruit. Protein is a polymer of amino acids and sulphur is a constituent of some amino acids viz. cysteine, cystine and methionine, and RNA and DNA is a constituent of base (N), sugar and phosphate.

Nutrient level of post-harvest soil

The soils from every plot after harvest of brinjal were analyzed for N, P, K and S contents. Total N content in soil was the highest (0.183%) in T_5 treated plot which was statistically similar to the all combined treatments i.e. T_7, T_8, T_9 and T_{10} treatments with the values of 0.174, 0.176, 0.175 and 0.178%, respectively (Table 6). Except in control plot, the total N content of soil had increased after compost-fertilizer treatments, in comparison with initial soil N value (0.12%). The P availability in soil had increased in all treated soils including control plot (Table 6). The T_{10} treatment showed the highest value (23.7 mg.kg^{-1}) which was significantly different from all other treatments. Next to T_{10}, the other three combined treatments (T_7, T_8 and T_9) were statistically identical. Application of manure and fertilizers added alone or in combination increased the available K content of soils (Table 6), the values being 13.3-21.5 mg.kg^{-1}. The highest K availability was noted with the press mud based compost (T_{10}) which was significantly higher over all other treatments, except T_8 (poultry manure based treatment) having the value of 19.2 mg kg^{-1}. All the treatments except control, exclusive fertilizer or compost showed higher S availability over the initial soil S (7.10 mg kg^{-1}). Like soil P and K contents, the T_{10} treatment had the highest S availability (13.79 mg kg^{-1}) followed by T_9 having the value of 12.59 mg kg^{-1}, they were statistically similar. Nonetheless, T_9 and T_8 treated plots had similar soil S content (Table 6). For all nutrients, the soils of control (T_1) plots exhibited the lowest values, showing 0.009% N, 10.0 mg kg^{-1} P, 3.2 mg kg^{-1} K and 4.26 mg kg^{-1} S against the initial levels of 0.12% N, 4.08 mg kg^{-1} P, 3.47 mg kg^{-1} K and 7.10 mg kg^{-1} S, respectively.

Table 6. Nutrient status of soils after crop harvest

Treatments	**Total N (%)**	**Available P (mg kg^{-1})**	**Available K (mg kg^{-1})**	**Available S (mg kg^{-1})**
T_1 : Control	0.115 d	10.0 d	3.2 f	4.26 f
T_2 : 100% CF	0.123 c	14.2 c	15.2 de	6.94 e
T_3 : Compost 1	0.132 b	10.3 d	13.3 e	6.48 e
T_4 : Compost 2	0.144 a	16.8 b	14.7 e	7.41 e
T_5 : Compost 3	0.136 a	13.7 c	13.6 g	7.31 e
T_6 : Compost 4	0.147 a	17.9 b	16.4 cd	8.24 d
T_7 : 50% CF + T_3	0.127 b	18.2 b	17.5 c	10.09 c
T_8 : 50% CF + T_4	0.136 a	18.2 b	19.2 a	11.29 b
T_9 : 50% CF + T_5	0.130 b	19.0 b	18.2 b	12.59 ab
T_{10} : 50% CF + T_6	0.141 a	23.7 a	21.5 a	13.79 a
Level of significance	**	**	**	**
CV (%)	4.66	8.23	7.18	3.92
SE (±)	0.007	1.28	0.87	0.69
Initial status	**0.121**	**11.20**	**3.47**	**7.10**

Compost 1= MSW 100% ; Compost 2= MSW 50% + MOC 20% + PM 30%; Compost 3=MSW 50% + MOC 20% + CD 30%; Compost 4 = MSW 50% + MOC 20% + SPM 30% .

SE (±) = Standard error of means, CV= Coefficient of variation; **, P < 0.01

In a column, the means followed by the same letters are not significantly different at 5% level by DMRT.

The results indicate that the N, K and S contents of soils in control plots (no fertilizer or compost added) decreased after brinjal cropping while the soil P content had little increased. The T_{10} treatment (50% fertilizer + press mud based compost) showed the best positive effect on soil nutrients (P, K and S) which was presumably due to higher mineralization. Thus, it is likely that the residual effects of organic amendment would have positive contribution to the next crop(s). Malik and Chauhan (2014) stated that integrated treatment (organic and inorganic) gave the higher values for soil N, P and K contents whereas the inorganic treatment gave significantly lower values for those nutrients. Rekaby et al. (2020) reported higher availability of nutrients in Egypt soils after organic amendment (biochar, humic acid, compost). As observed by Demir and Gülser (2015), application of rice husk compost improved the N, P and K status of soil.

Conclusion

Mixing of 20% mustard oilcake and 30% sugarcane press mud or poultry manure or cowdung with 50% MSW compost had markedly improved the nutrient value of MSW compost. The use of amended compost resulted in better yield with higher nutrient (N, P, K and S) concentration of brinjal fruit (edible portion). The integrated use of 50% chemical fertilizers and 50% compost mixture (50% MSW + 20% MOC + 30% SPM at a rate of total 10 t ha^{-1}) produced the best result. The nutrient status of soil had increased due to application of composts and it decreased in control plots. This study has useful implications for fertilizer management and recommendation strategies for different crops and soils.

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