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ORIGINAL RESEARCH PAPER

Influence organic compost compounds on soil chemical and physical properties

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ABSTRACT

This study was conducted to evaluate the impact of municipal waste compost and manure on soil chemical and physical properties quality and crop production in Sari city (north of Iran). In this study, the effect of compost and manure (cow and sheep) on the quality of soil organic material with experimental measurements was investigated. An experiment was conducted in a completely randomized design with 15 treatments and measurements with3 replicated. They have applied annually for 3 years to fifteen different plots. The soil of the study area was predominantly silty clay with temperate and humid climates. The following parameters were determined:1) Soil chemical properties comprising pH, 2) electrical conductivity and soil organic matter, 3) physical properties including 4) bulk density, 5) void ratio, and6) plant yield were investigated. The electrical conductivity and pH. Also, showed considerable changes. As well as, results showed that utilization of municipal waste compost and manure caused significant differences in organic matter, bulk density, void ratio, and yield at 1% significance level compared with the control treatment. Finally, it can be concluded that organic matter has pronounced effects on the physical, chemical and biological properties of soil and the use of organic fertilizers will definitely improve soil quality and productivity.

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INTRODUCTION

Today, sustained development attracted a lot of attention from development experts. Sustainable agriculture is one of the important aspects of sustainable development (Young, *et al.,* 2015). Maintaining the optimum amount of organic matter in the soil is one of the most basic agricultural principles (Schjonning *et al.*, 2017a). The most important sources of soil organic matters and nutrients are mostly livestock excrements, herbal remnants, and municipal waste compost that due to the importance of organic farming, their usage has been widely considered (Celik*et al.*, 2004; Chaudhry et *al.*, 1999). Inappropriate agronomic management, including dense cultivation and the complete removal of plant residues from soil, resulted in a gradual decrease in soil organic matter (Von Fragstein *et al.*, 2017(. As a result, the addition of organic matter to the soil is one of the most common methods for improving its physical properties (Karzija *et al.,* 2015; Sambyal Malik, 2014; Francou*et al.,* 2007). A solution to increase the

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amount of organic matter in soils of the country is the use of organic fertilizers such as animal manure (Hirzel *et al.,* 2018). Animal fertilizers are in fact derived from their fecal materials what usually comprised of sheep, cow, horse and chicken manure. Also animal manure is useful for soil richness due to the large amount of organic matters and nutrients that is beneficial for soil richness and has always been of interest to farmers over the course of history (Cooperband, 2000; Martínez-Blanco*et al.,* 2013). Organic fertilizers have effects on soil properties that increase yields in many crops by improving soil fertility, accessibility of various elements and consequently, by adjusting physical and chemical properties of soil (Hargreaves *et al.,* 2008(. On the other hand, today, with regard to promoting of urbanization and the production of large amounts of municipal waste in urban areas, one of the best methods of municipal waste management is to convert it into compost that factually plays a very important role in optimizing waste management (Bresson *et al.,* 2001; Francou *et al.,* 2007). Xiuli *et al*., (2016) conducted in northern China, reported that the use of organic and chemical fertilizers could affect soil physical properties by changing the organic carbon content of the soil, as well the chemical composition of soil solution. In another study Becker *et al*., 2010 to make a physical, physicochemical, and biological characterization of the compost obtained from the crop residues of the horticultural plants grown in the greenhouses and to evaluate the physical and chemical responses of the soil to be tested after applying this organic amendment. The compost has shown a high percentage of inorganic material, because the source of this compost includes not only crop residues but also soil; for this reason, it had a high coarseness index (CI), electrical conductivity (EC), and pH (Becker *et al*., 2010). Becker*et al*., 2010 showed that application of the organic amendment to a soil with reduced bulk density (BD) has increased the percentage of particles with large diameters, as well as increased the nutritional status and organic matter (OM). Akanni *et al.* (2007) and Bañados e*t al.* (2012) used municipal waste compost, sewage sludge and cow manure each of 15 and 45 t/ha, stated that addition of organic wastes to the soil increased the amount of organic material in plots compared to the control. Sewage sludge caused significant increase of soil organic matter at both levels of 15 and 45 tons (respectively 4.8% and 9.5%). However, municipal compost and cow manure increased by 14.28% compared to the control. Azeezand Van Averbeke, (2012) by using three types of animal manure (poultry, cattle and sheep), showed that the EC ratio in poultry manure was significantly higher than other two animal manure and the solubility of its salt was higher and in contrast, cattle and sheep manure caused an increase in pH. Urban waste compost in the soil improves the capacity of water storage as well as the soil structure. Also the amount of alkaline elements in the soil increases, followed by soil acidity and electrical conductivity (Hernando *et al.,* 1989; Zhang *et al.,* 2014). Aggelides *et al. (*2000) expressed the use of municipal waste compost in 4 levels of 15, 30, 45 and 60 tons per hectare with corn forage crops. At first, compost did not affect soil pH and its amount was the same in all treatments, but over time and during the growing season, it increased and decreased at the end of the season. However, the utilization of high levels of compost could have an incremental effect on pH level. Also, in relation to the effect of compost on EC, they expressed the addition of compost to soil increased the EC, but this increase was not significantly different among the other compost treatments. The reason for the increase in EC is the amount of total salts in the compost, which over time, due to the numerous irrigation of salts in the compost, it has been reduced and resulting in the EC. Today, due to the increasing population and human demand for food, farmers' attention has been focused on increasing production per unit area. Therefore, due to the lack of organic materials and unfavorable conditions in most parts of the country, they are seeking a solution to reduce soil degradation and better conservation (Sambyal Malik, 2014). On the other hand, due to the importance of the green space affect in cities, due to the various types of contaminations such as air pollution and sound pollution, their environmental functions, planting. Various types of trees, shrubs, flowers, grass and cover plants are necessary. Among the variety of plant species, seasonal flowers provide aesthetic to the spaces and they are more fanciful. The cultivation of these flowers in the soil with various types of livestock that strengthens the soil is a way to boost production. But today, the replacement of different types of compost rather than chemical fertilizers and livestock has become widespread. Considering the importance of using compost in creating green

spaces and the importance of using compost in agricultural production, the purpose of this study is to investigate the effect of utilization of municipal waste compost and litter (sheep and cow) on some properties of silty clay soil (relatively heavy textured soil).Altogether, researches above and many others in this field showed the optimal effect of organic matter on soil properties. This study has been carried out in in the Sari Agricultural and Natural Resources University (Province of Mazadaran in north of Iran) in 2015 to 2017.

MATERIALS AND METHODS

The soil used in this study was collected from afield experiment conducted at an experimental station at the University of Sari Agricultural and Natural Resources.Under a completely randomized design in a 3-year plan with 15 treatments and 3 replications in 6m^{2}plots.The soil was clay with a silt and sand, pH of 7.8, and exchange capacity (EC) of 0.7. The main characteristics of the soil used are summarized in (Table 1).The study is area dominated by silty clay texture. Three rates of compost, obtained from a watertreatment plant in SARI city, were used in thestudy.The climate of the region is moderate and humid. Fertilizer treatments which applied in the present study, composed of T1 as the control treatment without any usage of manure and fertilizers, T2 as the chemical fertilizer application with N, P, Kdosages of 100, 250 and 100 kg/ha respectively, T3 contains 15 tons of urban waste compost per hectare, T4 contains 15 tons of sheep manure per hectare, T5 includes 15 tons of cow manure per hectare, T6 containing 30 tons of municipal waste compost per hectare, T7 consists of 30 tons of sheep manure per hectare, T8 includes 30 tons of cow manure per hectare, T9 utilizes 15 tons of municipal waste compost per hectare plus 15 tons of sheep manure per hectare, T10 comprises of 15 tons of municipal waste compost plus 15 tons of cattle manure per hectare, T11 consists of 60 tons of municipal waste compost per hectare, T12 including 60 tons of sheep manure per hectare, T13 contains 60 tons of cow manure per hectare, T14 composed of 30 tons of municipal waste compost plus 30 tons of sheep manure per hectare and T15formed of 30 tons of urban waste compost plus 30 tons of cow manure per hectare, respectively. Some chemical properties of the studied soil, municipal waste compost and livestock manure are listed in (Tables 1 and 2).

Some soil chemical properties such as soil reaction using pH-meter (Kai, 2016); electrical conductivity by EC-meter (salinometer) (Nishanth *et al.,*2008) and soil organic carbon content using wet combustion were measured in the soil lab. As well, physical properties of the soil, including texture using hydrometric method (Andrés *et al.,* 2014); geometric mean diameter (GMD) and its standard deviation (σg) utilizing Jensen relationships (Schjonning *et al.,* 2017b); bulk density using undisturbed soil sampling and weighing after oven drying at 105°C (Klut and Dirksen, 1986; Khama *et al.,* 2013) were done (Tables 1 and 2).Data were analyzed using SPSS16 software and findings were presented using descriptive and analytical statistics. Also mean comparison fulfilled using the LSD statistical method (at 5% sig. level). Altogether, the trend of the mentioned soil properties variations in different treatments as well as the differences between them were investigated using this research.

Table 1. Some physical and chemical characteristics of the studied soil

Parameter	Unit	Value
Clay	%	38
Silt	%	44
Sand	%	18
GMD	mm	0.0434
σ^*	-	21.892
OC	%	1.34
Bulk density	g/cm^3	1.35
pH	-	7.80
EC	dS/m	0.7

*geometric standard deviation

Table 2. Some chemical properties of the studied urban compost and livestock manure

Measured parameters	Urban waste compost	Cow manure	Sheep manure
OC (%)	20.33	23.13	15.54
pH	7.76	7.91	7.80
EC(dS/m)	4.75	2.14	6.30

RESULS AND DISCUSSION

According to the analysis of variance (ANOVA) data, it was determined that various fertilizer treatments had a significant difference at 1% probability level on soil reaction(pH), soil electrical conductivity and soil organic matter (Table 3).

Table 4 shows the incremental trend for averages of electrical conductivity and soil organic matter besides the varying averages of soil reaction (soil pH) in relations with the control.

Soil pH and electrical conductivity

Soil pH measurement is useful because it is a predictor of various chemical activities within the soil. As such, it is also a useful tool in making management decisions concerning the type of plants suitable for location, the possible need to modify soil pH (either up or down), and a rough indicator of the plant availability of nutrients in the soil. Based on the results of this experiment, application of different fertilizer treatments in soil has a significant effect on soil reaction rate. It caused significant changes of soil pH in contrast with the control treatment (Table 3).On the basis of (Table 4), the maximum amount of pH was related to T13 (60 tons of cattle manure per hectare) which has an increase of 4.4% as compared to the control. The lowest amount of pH was connected to T7 (30 tons of sheep manure per hectare) which has a decrease of 3.49% compared with the control. In this experiment, the use of urban waste compost and livestock manure (sheep and cattle) significantly increased the electrical conductivity as compared to the control at a probability level of 1% (Table 3) which, according to the comparison of the averages in Table 4, it proves that T14 with 1.48 dS/m of EChas the highest electrical conductivity which has an increase of 111.49% compared with the control sample. (Fageria *et al.,* 2014) showed the five year application of urban compost with three levels of 15, 30 and 45 t/ha in the mixed form with chemical fertilizer of 25, 50 and 75% expressed the clear decrease of pH and an increase of EC after the application of urban waste compost. (Soobhany *et al.,* 2017)showed the utilization of municipal compost at four levels of 15, 30, 45 and 60 t/ha with planting of fodder corn, showed the null effect of compost on soil pH at first which resulted in the equal pH in the all treatments. But over the time, it increased and decreased after

Table 3. ANOVA of soil pH, EC and organic matter under various treatments

Variation sources	Degree of freedom	pH	EC	OM
Treatment	14	0.08221*	0.12071*	2.16683*
Error	30	0.01177	0.00135	0.18677
CV (%)	-	1.41	3.03	11.34

*significant difference at 1% probability level

Table 4. Comparison of means of soil pH, EC and organic matter under different treatments

Treatment	pH	EC(dS/m)	SOM (%)
T_1	7.72^{bcde}	0.69^{i}	1.98^{h}
T_2	7.49^{fg}	0.98^{h}	2.87^{g}
T_3	7.61^{defg}	1.09^{g}	3.31^{fg}
T_4	7.56^{defg}	1.12^{fg}	3.28^{fg}
T_5	7.63^{defg}	1.18^{ef}	4.18^{bcd}
T_6	7.66^{cdef}	1.17^{ef}	3.83^{cdef}
T_7	7.45^{g}	1.28^{d}	3.42^{efg}
T_8	7.83^{bc}	1.20^{e}	4.58^{ab}
T_9	7.70^{cde}	1.37^{c}	3.39^{fg}
T_{10}	7.83^{bc}	1.21^{e}	4.27^{bc}
T_{11}	7.78^{efg}	1.22^{de}	3.96^{bcdef}
T_{12}	7.73^{bcd}	1.40^{bc}	3.54^{defg}
T_{13}	8.06^{a}	1.36^{c}	5.29^{a}
T_{14}	7.55^{defg}	1.48^{a}	4.13^{bcde}
T_{15}	7.89^{ab}	1.44^{ab}	5.11^{a}

Different letters indicate significant difference at the 5% prob. level of the LSD test

the cultivating season and the end of the season, respectively. However, the overall use of high levels of compost could have an incremental effect on the pH content. Increase inEC, but this increase was not significantly different among the compost treated plots, which all are consistent with the results of this study (Table 4).

Soil organic matter

Soil organic matter is the fraction of the soil that consists of plant or animal tissue in various stages of breakdown (decomposition). Most of our productive agricultural soils have between 3 and 6% organic matter. Based on the results of this experiment, application of different fertilizer treatments including urban waste compost and manure (sheep and cow) in soil has a significant effect on organic matter. That caused significant changes in the control treatment (Table 3).The lowest amount of organic matter related to the control sample was 1.98%. The highest amount of organic matter was 5.29% for T13 treatment (60 tons of cow manure per hectare) which has an increasing about 167.17% as compared to the control. (Tong *et al.,* 2015), using chemical fertilizers and combining fertilizers with manure, stated that the combination of two fertilizers resulted in a 42.6% increase in the organic matter content of the studied soil. Also, (Misra *et al.,* 2010), used chemical fertilizer and blend it with livestock manure in which organic carbon has clearly increased from 4.2g/kg to6.1 g/kg in combination of two kinds of fertilizer. Also, (Meena *et al.,* 2019) and (Hargreaves, 2008), showed municipal waste compost mostly increases the soil organic matter as well as the soil quality, which all these pointed results have similarity with this research outcomes (Table 4).On the other hand, the use of compost reduces the consumption of poison; one of the most important benefits of using this fertilizer is reducing water consumption. The use of compost fertilizer clears the crop and so-called green emerging; the fertilizer produced does not contain weed seeds, insect eggs, disease pests and fungi (Table 4).

Soil bulk density

Soil bulk density is the mass of dry soil per unit of bulk volume, including the air space. Soil bulk density can vary substantially among different soil types and is affected by management practices (e.g. tillage, livestock was grazing, timber harvesting). Incorporation of large amounts of organic matter into the soil will lower the bulk density, while processes that compact the soil will increase bulk density. Generally, the bulk density of mineral soils range from 1.0 to 1.8 g/cm^3.On the basis of the present study, various fertilizer treatments significantly affect the soil bulk density at the 1% probability level (Table 5) which is in agreement with (Hussein, 2008), researches. The comparison of means (Table 6) showed that chemical fertilizer treatment(T2) with 1.39 g/cm3, has the maximum bulk density and 30 t/ha of urban waste compost plus 30 t/ha of cattle manure treatment(T15) with 0.91 g/cm^3 has the minimum bulk density, which has a decrease of 32.59% compared to the control (Table 6). In addition, soil bulk density has been decreased using organic fertilizers because of its lower volumetric mass than soil. Furthermore, organic waste matters improve soil structure and aggregation. (Xiuli *et al.,* 2016) expressed the usage of cow manure caused a decrease in soil bulk density. As has been proven in these results (Table 6), the application of 60 t/ha of urban waste compost (T11) and a mixture of 30 t/ha of cow manure with 30 t/ha of urban compost (T15) significantly reduced the bulk density of the soil of study area.

Void ratio

Table 5, shows the changes in soil bulk densityratio asa consequence of compost addition to soils.The current study showed a significant difference at the 1% statistical level for the soil void ration by utilization of municipal waste compost, chemical fertilizer and livestock manure. As can be seen in the table 6, based upon the comparison of means, the soil void ratio had an increasing about 105.15% compared to the control by using of 30 t/ha of municipal waste compost plus 30 t/ha of cattle manure(T15) (Table 6). These results are compared with (Nie, 2018) study of consistency abundance.

Table 5. ANOVA of the soil bulk density and void ratio under various treatments

Variation sources	degree of freedom	Bulk density	Void ratio
Treatment	14	0.05002*	2.7589*
Error	30	0.01518	1.4394
CV (%)	-	10.83	16.92

*significant difference at 1% probability level

Table 6. Comparison of means of soil bulk density and void ratio under different treatments

Treatment	Bulk density	Void ratio
T_1	1.35^{a}	0.97^{de}
T_2	1.39^{a}	0.83^{e}
T_3	1.19^{ab}	1.22^{bcd}
T_4	1.22^{ab}	1.17^{cde}
T_5	1.25^{ab}	1.22^{bcd}
T_6	1.07^{bcd}	1.38^{bc}
T_7	1.11^{bcd}	1.23^{bcd}
T_8	1.12^{bc}	1.23^{bcd}
T_9	1.10^{bcd}	1.30^{bcd}
T_{10}	1.13^{bc}	1.32^{bcd}
T_{11}	0.95^{cd}	1.54^{b}
T_{12}	1.09^{bcd}	1.29^{bcd}
T13	1.06bcd	1.37bc
T14	1.13bc	1.32bcd
T15	0.91d	1.99a

Different letters indicate significant difference at the 5% prob. level of the LSD test

Table 7. ANOVA of the dill yield (wet/dry weight) under various treatments

Variation sources	Degree of freedom	Wet weight	Dry weight
Treatment	14	10484.9*	901.273*
Error	30	10.9	4.172
CV (%)	-	1.29	3.10

*significant difference at 1% probability level

Dill yield

The ANOVA basis results has proven meaningful differences utilizing the above-mentioned fertilizer treatments on the dill yielding (wet and dry weight of the plant) at the 1% significance level (Table7). Also, the comparison of means has shown the lowest and highest wet and dry weight of dill, allotted to the control (T1) and 30 t/ha of urban waste compost plus 30 t/ha of cow manure (T15) treatments, respectively (Table 8). Applying of T15 caused an increase of wet and dry weight about 83.06% and 269.84%, respectively as compared to the control treatment (Table 8). Likewise (Moreira *et al.*, 2015) explained the increasing of soybean yield by usage of 40 t/ha of sewage sludge plus chemical fertilizer, in their investigation.Also, since soil organic matter can absorb water equivalent to two to six times its weight, it is very important to use compost fertilizer in arid and semi-arid soils, which is one of the main factors in reducing plant growth.Since organic matter is five times lighter than the mineral part of the soil, if the amount of organic matter increases by 1%, then at least 15% and the maximum 35% will reduce agricultural water consumption(Table 7).

Table 8. Comparison of means of dill yields under different treatments

Treatment	Dill wet weight(g/m^2)	Dill dry weigh(g/m^2)
T_1	190.88^{k}	25.24^{j}
T_2	231.24^{h}	54.30^{h}
T_3	210.55^{j}	51.30^{gh}
T_4	201.86^{l}	42.61^{i}
T_5	255.80^{gh}	62.17^{f}
T_6	239.15^{i}	58.30^{g}
T_7	265.78^{fg}	70.83^{d}
T_8	269.90^{e}	73.90^{cd}
T_9	258.28^{g}	65.64^{e}
T_{10}	270.88^{e}	75.30^{c}
T_{11}	261.82^{f}	66.12^{e}
T_{12}	273.92^{c}	75.40^{c}
T_{13}	318.70^{b}	83.67^{b}
T_{14}	325.75^{d}	85.28^{b}
T_{15}	349.43^{a}	93.35^{a}

Different letters indicate significant difference at the 5% prob. level of the LSD test

CONCLUSION

Regarding the study of references and researches done, it can be concluded that the use of organic fertilizers improve soften physical and chemical properties of the soil. Although compost application generally increases soil organic matter content, it is important to determine other parameters in order to better understand the effects of compost on soil organic matter quality. Organic matter is recognized as one of the soil fertility pillars due to the fundamental effects on the physical, chemical, biological and fertility properties of soil. These parameters provide information about soil organic matter component evolution after compost application. Finally it has been proven the advantages of using compost to improve some soil conditions such as: betterment of soil physical structure, correction of soil pH, soil fertilization, plant nutrition, moisture absorption and maintenance, increase and penetration of water, as well, increase of porosity and air-to-soil penetration, improvement of the quantity and quality of agricultural products and etc. the highest amount of soil organic materials and soil reaction are related to the treatment with application of 60 tons per hectare of cow manure(T13). Implementing of 30 tons of urban waste compost plus 30 tons of sheep manure per hectare(T15)caused the highest increase of soil EC as compared to the control, additionally, has had the most and greatest

improving effects on the other soil properties such as: bulk density, void ration and wet/dry yield of the dill. Finally, according to the results of this study, the treatment of 60 tons per hectare of cow manure and similarly, the combined treatment of 30 tons per hectare of cow manure plus 30 tons per hectare of municipal waste compost are the best recommended implementable treatments for the betterment of soil mentioned properties and its usage for agricultural purposes. This information can complement current knowledge about compost application, making it easier to develop compost application programs that improve soil characteristics such as water and nutrient retention and soil structure.

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CONFLICT OF INTERESTS

The author declares that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy have been completely observed by the authors.

ABBREVIATION

ANOVA	Analysis of variance
CV	Coefficient of variation
C^0	Degree centigrade
ds/m	Desi-simens per meter
EC	Electrical conductivity
g/kg	Gram per kilogram
g/m^2	Gram per square meter
g/cm^3	Gram per cubic centimeter
GMD	Geometric mean diameter
	Geometric standard deviation
Kg/ha	Kilogram per hectare
K	Potassium
LSD	Least square difference
m^2	Square meter
mm	Milli meter
N	Nitrogen
OC	Organic carbon
OM	Organic matter
P	Phosphorus
PH	Potential of Hydrogen
SPSS	Statistical package for social sciences
T	Treatment
t/ha	Tons per hectare
%	Percent

RERERENCES

Aggelides, S.M.; Londra, P.A., (2000).Effects of compost produced from town wastes and sewage sludge on the physical properties of a loamy and a clay soil. Bioresour. Technol., 71(3): 253-259 **(7 pages).**

Akanni, D.I.; Ojeniyi, S.O., (2007). Effect of different levels of poultry manure on soil physical properties, nutrients statues growth and yield of tomato. J. Agron., 1(1): 1-4 **(4 pages).**

Andrés N.B.; Silbermann, A.V.; Paladino, L.; Torres, D.; Bassahun, D.; Musselli, R.;García-Lamohte, G., (2014). Soil texture analyses using a hydrometer: modification of the Bouyoucos method. Cien. Inv. Agri., 41(2): 263-271 **(9 pages).**

Azeez, J.O.; VanAverbeke, W., (2012).Dynamics of Soil pH and Electrical Conductivity with the Application of Three Animal Manures.Commun. Soil Sci. Plant Anal., 43(1): 865-874 **(9 pages).**

Bañados, M.P.; Strick, B.C.; Bryla, D.R.; Righetti. T.L., (2012). Response of high bush blueberry to nitrogen fertilizer during field establishment. I. Accumulation and allocation of fertilizer nitrogen and biomass. HortSci., 47(5): 648-655 **(8 pages).**

Becker, J.S.; Ebrahimzadeh, A.; Plaza Herrada, B.M.; Lao,M.T., (2010). Characterization of compost based on crop residues: Changes in some chemical and physical properties of the soil after applying the compost as organic amendment. Commun. Soil Sci. Plant Anal., 41(2): 696-708 **(9 pages).**

Bresson, L.M.; Koch, C.; Bissonnais, Y.L.; Barriuso, E.;Lecomte, V., (2001). Soil surface structure stabilization by municipal waste compost application. Soil Sci. Soc. Am. J., 65(6): 1804-1811 **(8 pages).**

Celik, I.; Killik, S.; Ortas, I., (2004). Effects of compost, mycorrhiza, manure and fertilizer on some physical properties of a Chromoxerert soil. Soil Tillage Res., 78(1): 59-67 **(9 pages).**

Chaudhry, M.A.; Rehman, A.; Naeem, M.A.; Mushtaq, N., (1999). Effect of organic and inorganic fertilizers on nutrient contents and some properties of eroded loess soils. Pak. J. Soil Sci., 16(1): 63-68 **(6 pages).**

Cooperband, L.R., (2000). Composting: Art and science of organic waste conversion to a valuable soil resource. Lab. Med., 31(5): 283–290 **(8 pages).**

Fageria, N.K.; Moreira, A.; Moraes, L.A.C.; Moraes, M.F., (2014). Influence of lime and gypsum on yield and yield components of soybean and changes in soil chemical properties. Compos. Soil Sci. Plant Anal., 45(1): 271-283 **(13 pages).**

Francou,C.; Annabi, M.; Houot, S.; Poitrenaud, M.; Bissonnais, Y., (2007). Soil Aggregate stability Improvement with urban compost

of different maturities. Soil Sci. Soc. Am. J., 71(2): 413-423 **(11 pages).**

Hargreaves, J.C., (2008). A review of the use of composted municipal solid waste in agriculture. Agric. Ecosyst. Environ., 123(1): 1- 14 **(14 pages)**.

Hernando, S.; Lobo, M.C.; Polo, A., (1989). Effect of the application of municipal refuse compost on the physical and chemical properties of a soil. Sci. Total Environ., 81(1): 589-596 **(8 pages)**.

Hirzel, J.; Donnay, D.; Fernández, C.; Meier, S.; Lagos, O.; Mejias-Barrera, P.; Rodríguez, F., (2018). Evolution ofnutrients and soilchemical properties of sevenorganic fertilizers in two contrasting soils under controlled conditions. Chil. J. Agric. Animal Sci., 34(2): 77-88 **(12 pages).**

Hussein, H., (2009). Impact of sewage sludge as organic manure on some soil properties, growth, yield and nutrient contents of cucumber. Crop J. Appl. Sci., 9(8): 1401-1411 **(11 pages).**

Kai, T.; Mukai, M.; Kiwako, S.A.; Adhikari, D.; Kubo, M., (2016). Analysis of chemical and biological soil properties in organically and conventionally fertilized apple orchards. J. Agric. Chem. Environ., 5(1): 92-99 **(8 pages).**

Karažija, T.; Ćosić, T.; Lazarević, B.; Horvat, T.; Petek, M.; Palcic, I.; Jerbić, N., (2015). Effect of organic fertilizers on soil chemical properties on vineyard calcareous soil. Agric. Conspectus Sci., 80(2): 79-84 **(6 pages).**

Khama, O.; Cedric, K.; Nelson, L., (2013). Comprehensive stability and strength of a hard setting soil formed with cattle manure. Int. J. Manure Fert., 2(12): 440-444 **(5 pages).**

Klut, A.; Dirksen, C., (1986). Methods of soil analysis. Part 1: Physical and 6-5 mineralogical methods. Madison Wisconsin, 1(1): 635-662 **(8 pages).**

Martínez, B.J.; Lazcano, C.; Christensen, T.; Muñoz, P.;Rieradevall, J.; Møller, J.; Antón, A.; Boldrin, A., (2013). Compost benefits for agriculture evaluated by life cycle assessment. A review. Agron. Sustainable Develop., 33(4): 721-732 **(12 pages).**

Meena, M.D.; Yadav, R.K.; Narjary,B.; Yadav,G.; Jat, H.S.; Sheoran, P.; Meena, M.K.; Antil, R.S.; Meena, B.L.; Singh, H.V.; Singh M.V.; Rai, P.K.; Ghosh, A.; Moharana, P.C., (2019). Municipal solid waste (MSW): Strategies to improve salt affected soil sustainability: A review. Waste Manage., 1(84): 38-53 **(16 pages).**

Misra, A.K.; Bandyopadhyay, K.K.; Chosh, P.K.; Hati, K.M., (2010). Effect of integrated use of farmyard manure and chemical fertilizer on soil physical properties and productivity of soybean. Soil Tillage Res., 1(1): 115-125 **(11 pages).**

Moreira, A.; Sfredo, G.J.; Moraes, L.A.C.; Fageria, N.K., (2015). Lime and cattle manure in soil fertility and soybean grain yield cultivated in tropical soil. Commun. Soil Sci. Plant Anal., 46(9): 1157-1169 **(13 pages).**

Nie, E.; Zheng, G.; Shao, Z.; Yang, J.; Chen, T., (2018).Emission characteristics and health risk assessment of volatile organic compounds produced during municipal solid waste composting. Waste Manage. 79(1): 188-195 **(8 pages).**

Nishanth, D.; Biswas, D.R., (2008). Kinetics of phosphorus and potassium release from rock phosphate and waste mica enriched compost and their effect on yield and nutrient uptake by wheat (Triticumaestivum). Bioresour. Technol., 99 (9): 3342-53 **(12 pages).**

Sambyal, M.S.; Chauhan, R.C.; Laura, J. S.; Kapoor, T.; Abhilashi, R.; Sharma, N., (2014). Influence of organic and synthetic fertilizers on soil physical properties. Int. J. Curr. Microbiol. App., 3(8): 802-810 **(9 pages).**

Schjonning, P.; Jensen, J.; Watts, C.; Bent, C.; Lars, M., (2017a). Soil texture analysis revisited: Removal of organic matter matters more than ever. PLOS ONE., 12(5): 1-10 **(10 pages).**

Schjonning, P.; McBride, R.A.; Keller, T.; Obour, P.B., (2017b). Predicting soil particle density from clay and soil organic matter contents. Geoderma., 286(1): 83-87 **(5 pages).**

Soobhany, N.; Mohee, R.; Garg, V.K., (2017). A comparative analysis of composts and vermicomposts derived from municipal solid waste for the growth and yield of green bean (Phaseolus vulgaris). Environ. Sci. Pollut. Res. Int., 24(12): 11228-11239 **(12 pages).**

Tong, X.G.; Xu, M.G.; Zhang, W.J.; He,Y.T.; Sun, F.X.; Wang, J.Z.; Huang, P.; Zhu, P.; He, X.H., (2015). Long-term combined chemical and manure fertilizations increase soil organic carbon and total nitrogen in aggregate fractions at three typical cropland soils in china. Sci. Total Environ. 532(1): 635-644 **(10 pages).**

von Fragstein, P.; Hossain, M.Z. ; von Niemsdorff, P.; Heß, J., (2017). Effect of different organic wastes on soil Properties and plant growth and yield: A review. Sci. Agric. Bohemia., 48(4): 224–237 (14 pages).

Xiuli, X.; Zhang, J.; Zhu, A.; Zhang, C., (2016).Effects of long-term (23 years) mineral fertilizer and compost application on physical properties of fluvo-aqauic soil in the North China Plain. Soil Tillage Res., 156(1): 166–172 **(7 pages).**

Young, J.R.; Evans-Kocinski, S.; Bush, R.D.; Windsor, P.A., (2015). Improving smallholder farmer biosecurity in the Mekong Region through change management. Transbound Emerg. Dis., 62(5): 491-504 **(14 pages).**

Zhang, J.; Yang, J.; Yao, R.; Yu, S.; Li, F.; Hou, X., (2014). The effect of farmyard manure and mulch on soil physical properties in a reclaimed coastal Tidal flat salt-affected soil. J. Integr. Agric., 13(8): 1782-1790 **(9 pages).**

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