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Impact of tank silt and FYM application on soil quality and yield of soybean (*Glycine max* L.) under inceptisol

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Abstract
The field experiment was conducted during *kharif* season 2016-17 at farm, Department of Soil Science and Agricultural Chemistry College of Agriculture, Latur. The experiment under soybean with various treatments, T_1 Control, T_2- 100% RDF, T_3- Tank silt @15t/ha + RDF, T_4- Tank silt @ l0t/ha + RDF, T_5- Tank silt @5t/ha + RDF, T_6- Tank silt @ l0t/ha + FYM @ 2.5t/ha + RDF, T_7- Tank silt @ 5t/ha + FYM @ 2.5t/ha +RDF, T_8-Tank silt @15t/ha + FYM @ 2.5t/ha + RDF, T_9-FYM 5t/ha + RDF. The experiment was laid out in RBD design in all there were nine treatments and three replications. The moisture content in the root zone (0-15) increased with increasing rate of tank silt application at fifteen days interval. The maximum soil moisture was found in treatment T_3 Tank silt @15 t ha^{-1} + RDF. The bulk density and pH of soil decreased where as organic carbon content, NPK and DTPA extractable micronutrient was increased and found maximum in treatment T_7- Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF followed by T_6-Tank silt @ 10 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF which was significantly superior over application of tank silt, FYM and RDF alone. Similar trend was observed in case of yield The maximum yield of soybean was noticed in treatment tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF and minimum yield was noticed in control. However, from above concluded that the application of tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF (inorganic fertilizer) improves soil fertility and yield of soybean under Inceptisols. This was clearly showed that the fifty per cent saving of FYM application by tank silt application.

Keywords: tank silt, fym, soil quality and yield of soybean.

Introduction
Soybean (*Glycine max*. L) be longs to family *Leguminosae* with sub family *Papilionaceae*. is basically a pulse crop but is gaining importance as an oil seed crop. The tank sediments have 20 percent higher nutritive value over their respective cultivated catchment soil (Anonymous, 2003 [2] & Vaidya and Dhawan (2013) [8]. Tank sediments can be used preferably in the fields of respective catchment to build up their productivity. Vaidya and Dhawan (2015) [10] reported that the application of tank silt in very shallow soils improve the soil quality and productivity of very shallow soil. Addition of tank sediments to cultivated fields improves the physico-chemical properties of the soil which results in good crop growth and higher yields. Kabir *et al*. (1991) [12], Shankaranarayana (2001) [14], Ramesh (2001) [15] and Anonymous (2003) [2] observed higher crop yield with the addition of tank sediments to the soil.

Materials and Methods
The field experiment was conducted during *kharif* season 2016-17 at farm, Department of Soil Science and Agricultural Chemistry College of Agriculture, Latur. The experiment under soybean with various treatments, T_1 Control, T_2- 100% RDF, T_3- Tank silt @15t/ha + RDF, T_4- Tank silt @ l0t/ha + RDF, T_5- Tank silt @5t/ha + RDF, T_6- Tank silt @ l0t/ha + FYM @ 2.5t/ha + RDF, T_7- Tank silt @ 5t/ha + FYM @ 2.5t/ha +RDF, T_8-Tank silt @15t/ha + FYM @ 2.5t/ha + RDF, T_9-FYM 5t/ha + RDF. The experiment was laid out in RBD design in all there were nine treatments and three replications. The soil was clay with pH 7.68, organic carbon content 0.51 percent, $CaCO_3$ content 14.00 per cent and available NPK 177.8, 12.98 and 345.6 kg ha^{-1} respectively and the tank silt was clay, alkaline (7.4) and Calcarious (13.3%) in nature and available NPK was 217, 23.5 and 431.52 kg ha^{-1} respectively. Recommended dose of fertilizer (30:60:30 kg NPK ha^{-1}) was supplied through urea, single super phosphate, murate of potash and organic manure as tank silt and FYM. The soil samples was collected after harvest of crop and analyzed for physical and chemical properties of soil.

Result and Discussion

Effect on physical properties

The data pertaining to soil moisture content at different growth stages at 0-15 cm depth presented in table 1. Soil moisture content significantly affected due to different combination of treatment at fifteen day interval. Initially the maximum soil moisture content At 15 and 30 DAS was found at treatment T_3 (tank silt @ 15 t ha^{-1} + RDF) and par with treatment T_8 (Tank silt @15 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF), T_6 (Tank silt @10 t ha^{-1} +FYM @ 2.5 t ha^{-1} + RDF) and T_4(Tank silt @ 10 t ha^{-1} + RDF), and significantly superior over rest of the treatment. At 45 to 120 DAS the treatment T_3 (tank silt @ 15 t ha^{-1} + RDF) was found at par with treatment T_8 (Tank silt @15 t ha^{-1} +FYM @ 2.5 t ha^{-1} + RDF), and significantly superior over rest of the treatments. This is due to application of tank silt and FYM. The similar result was reported by Yadahalli (2008) [17] and Osman (2007) [13] that the application of tank silt, green leaf manures and crop residue in set furrows improved the soil moisture, in Inceptisol. Vaidya and Dhawan (2014) [9] resulted that tank silt hybridization improve the water holding capacity of soil.

Table 1: Effect of tank silt and FYM application on soil moisture content (%) in soil under soybean.

Treatment	15DAS	30DAS	45DAS	60DAS	75DAS	90DAS	105DAS	Harvesting
	0-15 cm	0-15 Cm	0-15 cm	0-15 Cm	0-15 cm	0-15 cm	0-15 cm	0-15 Cm
T_1	27.20	33.67	35.00	40.37	38.01	36.03	35.19	31.18
T_2	28.02	40.94	42.94	40.91	39.34	37.37	36.68	32.68
T_3	38.97	45.82	53.08	50.82	48.77	47.77	46.77	42.82
T_4	37.15	42.34	44.34	42.10	40.47	38.50	36.83	36.84
T_5	29.42	32.33	43.23	33.40	31.71	39.72	37.38	33.40
T_6	38.82	43.53	47.00	43.50	41.55	40.47	39.13	35.13
T_7	32.42	37.23	42.69	39.05	33.03	37.03	37.05	35.07
T_8	38.83	44.02	50.04	50.77	48.50	47.53	45.54	41.60
T_9	29.46	40.76	45.03	41.06	38.76	36.78	34.77	31.11
General mean	33.37	40.30	44.83	42.44	40.02	40.13	38.82	35.20
SE	1.849	1.433	1.678	1.646	1.742	1.760	1.939	1.947
CD a at 5%	5.542	4.297	5.032	4.934	5.223	5.275	5.811	5.838

Bulk density

The result regarding effect of tank silt and FYM application on bulk density of soil after harvest was presented in table 2.The bulk density varied from 1.60 to 1.69 mg cm^{-3} under different treatments of tank silt and its combination with FYM and which was found non significantly affected. The lowest value of bulk density was noticed in treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF). Similar result also reported by Jeyamangalam *et al.* (2012) [4] and revailed that bulk density was decreased as the dosage of organic manure was increased. The result were in agreement with findings of Kadam *et al.* (2016) [11] reported that the application of tank silt in combination of organic manure and inorganic fertilizer reduced the bulk density of soil.

Effect on chemical properties of soil

Soil Reaction

The pH of soil found to be in the range of 7.45 to 7.63. The result shows that the pH of soil was not affected significantly due to application of different doses of tank silt and FYM. The lowest pH was noticed at treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) followed by T_6 (Tank silt @ 10 t ha^{-1}+ FYM @ 2.5 t ha^{-1}) and maximum pH was noticed in treatment T_1 (control) followed by treatment T_2 (100% RDF). This may be due to application of FYM and tank silt. Similar result also reported by Jayamangalam *et al.* (2012) [4] and reviled that the application of tank silt and FYM reduced the soil pH due to production of organic acid during mineralization of organic material.

Salt Concentration (EC of soil)

The application of different doses of tank silt and FYM minimum EC value (0.21 dsm^{-1}) was recorded in T_7 (TS 5 t ha^{-1} + FYM 2.5 t ha^{-1} + RDF) than all other treatment followed by treatment T_6 (TS 10 t ha^{-1}+ FYM 2.5 t ha^{-1}+ RDF). The maximum EC value of soil was recorded in T_1 (control).The data regarding residual effect of tank silt and FYM on soil EC of initial soil sample was higher as compared to the sample collected after harvest of crop. This reduction in EC of post-harvest Samples might be due to leaching of salts and utilization of nutrients by crop. Similar result was also observed by Jeyamangalam *et al.* (2012) [4] and Kadam *et al.* (2016) [11].

Organic Carbon

The data pertaining the effect of various treatments on organic carbon content of soil was found to be in range of 0.55 to 0.79 per cent presented in table 2. The maximum organic carbon content in soil was noticed in treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) and was found at par with treatment T_6 (Tank silt @10 t ha^{-1} +FYM @ 2.5t ha-1 + RDF), T_9 (FYM @ 5 t ha^{-1} + RDF), T_5 (Tank silt @ 5 t ha^{-1} + RDF) and T_4 (Tank silt @ 10 t ha^{-1} + RDF) and significantly superior over rest of the treatments. The organic carbon content in soil was significantly increased over all treatment. This indicated that the application of tank silt in combination with FYM improve organic carbon in soil comparative than its alone application in soil. Similar observation also reported by Jeyamangalam *et al.* (2012) [4] improvement of organic carbon due to addition of tank silt and organic manure in soil and also reported by Osman (2007) [13], Vaidya and Dhawan (2015) [10] and Kadam *et al.* (2016) [11].

Calcium Carbonate ($CaCO_3$)

The calcium carbonate content was decreased in all the treatment than the control. The effect of different doses of tank silt and FYM on $CaCo_3$content in soil was found non-significant and which was varies from 6.88 to 13.78 per cent. The minimum $CaCo_3$ was noticed in treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM 2.5 t ha^{-1} + RDF) and the maximum value of $CaCo_3$ was recorded in T_1 (control). This clearly indicated that the application of organic manure (FYM) reduced the $CaCo_3$ content in soil might be due to addition of sufficint organic matter in the soil. (Jenkinson and Johnson, 1977) [5].

Table 2: Effect of tank silt and FYM application on physical and chemical properties of soil under soybean.

Treatments	BD (Mg/m^3)	PH	EC (dsm^{-1})	Organic Carbon (%)	$CaCO_3$ (%)
T_1- Control	1.69	7.63	0.28	0.55	13.79
T_2- 100% RDF	1.67	7.62	0.26	0.64	12.10
T_3- Tank silt @15t/ha + RDF	1.68	7.60	0.23	0.65	11.21
T_4- Tank silt @ 10t/ha + RDF	1.66	7.54	0.25	0.69	10.47
T_5- Tank silt @5t/ha + RDF	1.63	7.49	0.24	0.73	10.26
T_6- Tank silt @ 10/ha + FYM @ 2.5t/ha + RDF	1.61	7.46	0.22	0.76	7.70
T_7- Tank silt @ 5t/ha + FYM @ 2.5t/ha +RDF	1.60	7.45	0.21	0.79	6.88
T_8- Tank silt @ 15t/ha + FYM @ 2.5t/ha + RDF	1.67	7.61	0.26	0.68	11.62
T_9- FYM @ 5t/ha + RDF	1.62	7.47	0.23	0.75	9.33
General mean	1.64	7.54	0.24	0.69	10.37
SE (m) ±	0.062	0.045	0.015	0.034	0.516
CDa at 5%	NS	NS	NS	0.102	NS
Initial value	1.71	7.68	0.30	0.51	14.00

Effect on available Nutrient status

Available Nitrogen

The data pertaining to effect of different doses of tank silt and FYM application on availability of nitrogen in soil after harvest of soybean reviled that the available nitrogen in soil was found in the range of 182.67 to 255.50 kg ha^{-1}.Among the various treatment application of T_7 (Tank silt 5 t ha^{-1}+ FYM 2.5 t ha^{-1} + RDF) showed significantly higher N (255.50 kg ha^{-1}) and found superior over rest of the treatments and it was low (182.67 kg ha^{-1}) in T_1 (control). The result showed that the availability of nitrogen in soil was increased due to application of nitrogen and phosphorous level and recorded significant effect on availability of nitrogen in soil, which released nitrogen on mineralization and application of essential nutrient in adequate amount through fertilizer helps in built up of nutrients in soil transformation of NH_4^+ to NO_3 in the aerobic soils. The nitrogen when applied to soil get dissociated to NH_4^+ which readily gets oxidized to NO_3 which is either taken up by crop or leaches down to lower layer of soil as it is readily soluble in water and Some amount of NO_3, nitrogen is also immobilized by soil microbes during the process of mineralization of organic matter. Ammonical nitrogen (NH_4^+) formed from the mineralized organic matter is adsorbed on the clay complexes or oxidized to NO_3^- or immobilized by soil microbes, but very little of it leaches down. The result are in conformity with these earlier reported by Kadam (2016) [11] result found that significant incises available N was found maximum in tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF. Similar result reported by Jeyamangalam *et al.* (2012) [4] revealed that the nitrogen content was maximum as 173 kg ha^{-1} with TS + CP combination @ 17.5 t ha^{-1}. It was 43.48 per cent higher than the control. Similar observation reported by Tiwari *et al.* (2014) [16] tank silt applied cropland was found to be richer in phosphorus and nitrogen.

Table 3: Effect of tank silt and FYM application on available N P K and DTPA extractable micronutrients.

Treatments	Available N (kg ha^{-1})	Available P (kg ha^{-1})	Available k (kg ha^{-1})	Fe (mg kg^{-1})	Mn (mg kg^{-1})	Zn (mgkg^{-1})	Cu (mg kg^{-1})
T_1- Control	182.6	13.3	503.0	5.27	2.98	0.54	1.02
T_2- 100% RDF	192.2	13.8	510.0	5.83	4.84	0.61	1.24
T_3- Tank silt @15t/ha + RDF	197.8	14.1	512.0	6.89	4.95	0.61	1.44
T_4- Tank silt @ 10t/ha + RDF	199.7	14.5	617.8	6.91	5.75	0.62	1.45
T_5- Tank silt @5t/ha + RDF	218.4	15.9	691.9	7.40	5.85	0.63	1.53
T_6- Tank silt @ 10t/ha + FYM @ 2.5t/ha + RDF	224.0	16.1	703.6	7.45	5.92	1.04	1.88
T_7- Tank silt @ 5t/ha + FYM @ 2.5t/ha +RDF	255.5	18.0	775.4	8.37	6.78	1.07	1.94
T_8- Tank silt @ 15t/ha + FYM @ 2.5t/ha + RDF	198.1	14.4	520.1	6.85	5.02	0.62	1.50
T_9- FYM @ 5t/ha + RDF	220.2	16.0	700.0	7.43	5.88	0.65	1.54
General mean	209.8	15.1	614.8	6.93	5.33	0.71	1.50
SE (m) ±	8.1	0.62	61.98	0.237	0.314	0.041	0.062
CD a at 5%	24.5	1.86	82.87	0.711	0.942	0.122	0.186
Initial value	177.8	12.98	345.6	5.22	2.31	0.51	1.00

Available phosphorous (P)

Effect of tank silt and FYM application on availability of phosphorous in soil after harvest of soybean crop clearly showed that available phosphorous was found to be in ranges from 13.38 to 18.01 kg ha^{-1} and presented in table 3.Among the various treatment T_7 (Tank silt @ 5 t ha^{-1}+ FYM @ 2.5 t ha^{-1} + RDF) showed maximum P (18.01kg ha^{-1}) and was found at par with T_6 (Tank silt @ 10 t ha^{-1} + FYM @ 2.5 t ha^{-1} RDF) and significantly superior over rest of the treatment. In treatment T_1 (control) observed minimum P (13.38 kg ha^{-1}).Similar result also reported by Ramesh *et al.* (2011) reported that availability of phosphorous and potassium at due to fertilizer combination with organic manures which is largely attributed to mineralization of P fixation and organic recycling. Jeyamangalam *et al.* (2012) [4] studied that phosphorous content was maximum as 51.3 kg ha^{-1} with TS+ CP+F combination and Kadam (2016) [11] reported that maximum phosphorus was content as application of 5 t ha^{-1} tank silt + @ 2.5 t ha^{-1} FYM + RDF under okra in Inceptisol.

Available potassium (K)

Effect of tank silt and FYM application on available potassium in soil after harvest of soybean crop shows that available potassium was found to be in range of 503.00 to 775.45 kg ha^{-1}Among the various treatments, application of T_7 (Tank silt 5 t ha^{-1}+ FYM 2.5 t ha-1 + RDF) showed highest K (775.45 kg ha^{-1}) and was found at par with T_6 (Tank silt @10 t ha^{-1} + FYM @ 2.5 t ha-1 RDF) and T_9 (FYM @ 5 t ha^{-1}

+ RDF) and significantly superior over rest of treatments. and it was lower (503.00 kg ha^{-1}) at T_1 (control). Similar result observed by Bhanavase *et al.* (2011) [3] observed that the tank silt application improve K_2O from 232.6 to 283.4 kg ha^{-1} in soil. Kadam (2016) [11] reported that the potassium was maximum as (841.33 kg ha-1) in treatment @ 5 t ha^{-1} tank silt + @ 2.5 t ha^{-1} FYM + RDF and which was significantly superior over control.

Available DTPA extractable micronutrient.

The significant effects of tank silt and FYM application on the micronutrients (Fe, Mn, Zn, Cu) are presented in table 4.Among all the treatment application of T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) showed significantly superior over all other treatment for Fe (8.37 mg kg^{-1}),while the application of T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) showed highest Mn (6.78 mg kg^{-1}) and it was found at par with T_6 (Tank silt @ 10 t ha^{-1} + FYM @ 2.5 t ha-1 RDF),T_9 (FYM @ 5 t ha^{-1} + RDF) and T_5 (Tank silt @ 5 t ha^{-1} + RDF) showed significantly superior over all other treatment. while the application of T_7 (Tank silt @ 5 t ha-1 + FYM @ 2.5 t ha^{-1} + RDF) showed highest Zn (1.07 mg kg^{-1}) and Cu (1.94 mg kg^{-1}) it was at par with treatment T_6 (Tank silt @ 10 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) and T_9 (FYM @ 5 t ha^{-1} + RDF). and minimum concentration of all these micronutrient was observed in T_1 (control).This result are in line with Kadam (2016) [11] shared an encouraging effect of combination of tank silt organic manure and inorganic fertilizer under okra in Inceptisols. Ramprasad *et al. (*2009) reported that the application of tank silt in the soil helps in retention of nutrients in soil and increases the fertility of soil. Vaidya and Dhawan (2014) [9] reported that the tank silt having 15 to 20 per cent maximum nutritional status that the soils of adjoining area of the tank.

Effect on Yield and Yield attribute of Soybean

Number of Pods

The data regarding the number of pods recorded at different growth stages are presented in table 4. Application of different doses of tank silt and organic manure increase number of pods. The maximum number of pods at pod formation stage (25.17) observed with treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) and it was at par with T_6 (Tank silt @10 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF), T_9 (FYM @ 5 t ha^{-1} + RDF), T_5 (Tank silt @ 5 t ha^{-1} + RDF) and T_4 (Tank silt @ 10 t ha^{-1} + RDF). And at harvesting stage maximum number of pods (28.97) observed with treatment T_7 (Tank silt 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) showed significantly superior over all other treatment and T_1 (control) recorded minimum number of pods at pod formation (19.07)and harvesting stage (20.33). The result are in conformity with are these earlier reports by Annadurai *et al.* (2005) [1] found that significantly higher number of pods were observed with application of 20 t ha^{-1} tank silt because of the supply of all the essential plant nutrients required for its growth through tank silt and similar finding was also reported by Kadam *et al.* (2016) [11].

Table 4: Effect of tank silt and FYM application on yield and yield attributes

Treatments	Pod Formation	Harvesting Stage	Yield (kg/plot)	Yield (q ha^{-1})
T_1- Control	19.07	20.33	2.43	12.15
T_2- 100% RDF	20.22	21.06	3.83	19.15
T_3- Tank silt @15 t/ha + RDF	20.87	21.07	4.12	21.00
T_4- Tank silt @ 10 t/ha + RDF	23.00	23.00	4.20	22.50
T_5- Tank silt @5 t/ha + RDF	23.54	24.55	4.55	22.75
T_6- Tank silt @ 10 t/ha + FYM @ 2.5t/ha + RDF	25.17	26.17	5.02	25.08
T_7- Tank silt @ 5 t/ha + FYM @ 2.5t/ha +RDF	25.25	28.97	5.35	26.75
T_8- Tank silt @ 15 t/ha + FYM @ 2.5t/ha+ RDF	22.0	22.15	4.50	22.58
T_9- FYM @ 5 t/ha + RDF	24.18	25.35	4.97	24.83
Genral mean	22.58	23.62	4.35	16.60
SE (m) ±	1.035	0.869	0.230	1.159
CD at 5%	3.102	2.606	0.691	3.474

Yield per plot (kg)

The yield data kg per plot as influenced by different treatment were recorded and presented in table 5.The result indicated that soybean yield increased significantly due to application of different doses of tank silt and FYM. The treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) produced maximum grain yield per plot (5.35 kg $plot^{-1}$) which was at par with treatment T_6 (Tank silt @10 t ha^{-1} + FYM @ 2.5 t ha^{-1}+ RDF) and T_9 (FYM @ 5 t ha^{-1} + RDF) and significantly superior over rest of the treatments. Minimum yield per plot (2.43kg $plot^{-1}$) was recorded in treatment T_1

Yield per hectare (q)

The yield data of soybean grain as influence by different treatment were recorded and presented in table 6.The result indicated that soybean grain yield increased significantly due to application of different doses of tank silt and FYM. Treatment T_7 (Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) produced maximum grain yield per hectare (26.75 q ha^{-1}) which was at par with treatment T_6 (Tank silt @ 10 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF) and T_9 (FYM @ 5 t ha^{-1} + RDF) and significantly superior over rest of the treatments. Minimum yield per hectare (12.15 q ha^{-1}) was recorded with treatment T_1 (control). Similar observation was noticed by Krishnappa *et al*. (1998) [7] Recorded that significant increase in crop yields q ha^{-1} an application of tank silt. The percent increase in crop yield was 60.6 (groundnut), 77.0 (Maize), 80.0 (rainfed ragi), 80.0 (tomato), 80.0 (mulberry) and 80.0 (irrigated ragi) as compared to without application of tank silt plots. Osman (2007) [13] studied on tank silt application and observed that plant population and plant height was higher in tank silt applied soil over control he also reported that yield of cotton 40 per cent increase over control. Kadam (2016) [11] reported that tank silt, organic mannue and inorganic fertilizer improve the yield of okra under Inceptisol.

Conclusion

Organic carbon, available nutrient status of soil was significantly influenced due to different doses of tank silt and FYM application and found maximum with application of

tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF. Soil moisture content was recorded maximum with application of tank silt @ 15t/ha + RDF followed by tank silt @ 15t/ha + FYM @ 2.5 t ha^{-1} + RDF than the control. Maximum yield (26.75 q ha^{-1}) was recorded with application of tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF followed by tank silt @ 10 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF. From the above however, concluded that the application of tank silt @ 5 t ha^{-1} + @ 2.5 t ha^{-1} FYM in combination with inorganic fertilizer (RDF) improve the soil quality and yield of soybean as compare to its alone application. However these results are of one year experiment needs confirmation by conducting multiplication trial.

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