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Effect of tank silt, organic and inorganic fertilizers on growth, nutrients uptake yield and yield attributes of chilli (*Capsicum annum* L.) under Inceptisol

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Abstract
The experiment was laid out in a randomized block design with three replications and ten treatments. T_1- Absolute control, T_2- 100% RDF, T_3- 125% RDF, T_4 -150% RDF, T_5- 100% RDF +20 kg ha^{-1} $FeSO_4$, T_6- 100% RDF + 20 kg ha^{-1} $ZnSO_4$, T_7 – 100% RDF + FYM @ 5 t ha^{-1}, T_8- 75% RDF + Vermicompost @ 2.5 t ha^{-1}, T_9- 100% RDF + Neemcake @ 2.5 t ha^{-1} and T_{10} – 100% RDF + Tank silt @ 5 t ha^{-1} +FYM @ 2.5 t ha^{-1}. The Jwala variety of chilli was used for study. The effect of organic manures in combination with inorganic fertilizer was noticed on important growth parameters *viz.*, plant height, number of branches, at different growth stages 40, 60 and 80 DAT of chilli crop. The application of 100% RDF+ Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} (T_{10}) recorded highest plant height at 40 DAT (26.77cm), 60 DAT (41.52cm) and 80 DAT (72.37cm). Similarly, maximum result regarding to the number of branches at 40 DAT (6.63), 60 DAT (18.50) and 80 DAT (21.25cm) increased positively up to 80 days and which was significantly superior over rest of the treatment. The increase in yield and nutrients uptake with application of organic manure in combination with inorganic fertilizers. The maximum yield of chilli at treatment receiving 100% RDF +Tank silt @ 5t ha^{-1} + FYM @ 2.5 t ha^{-1} and recorded higher values of all the nutrient uptake N (95.26 kg ha^{-1}), P (36.28 kg ha^{-1}) and K (181.34 kg ha^{-1}) and micronutrients recorded highest Fe (704.64 g ha^{-1}) at 100% RDF +20 kg $FeSO_4$ ha^{-1} (T_5) and Zn (1387.18 g ha^{-1}) at 100% RDF + 20 kg ha^{-1} + $ZnSO_4$ (T_6) as compared with organic or inorganic fertilizer alone.

Keywords: Tank silt, organic, inorganic, fertilizers, chilli, *Capsicum annum* L.

Introduction
Chilli (*Capsicum annum* L.) is one of the most important commercial crop of India which belongs to family Solanaceae. It is also called as hot pepper, red pepper, cayenne pepper, capsicum, etc. Most of the cultivated varities in India belong to the species *Capsicum annum* L. It is grown almost throughout the country. India is the largest producer of chillies in the world and earns valuable foreign exchange for the country (Venkateshalu, 2009) [25] Tank sediments have 20% higher nutritive value over their respective cultivated catchment soil. (Anonymous, 2003; Vaidya and Dhawan 2014) [1, 23]. Tank sediments can be used preferably in the fields of respective catchment to build up their productivity. Addition of tank sediments to cultivated fields improves the physic-chemical properties of the soil which results in good crop growth and higher yields (Kabir, 1991) [9]. Neem cake has adequate quantity of NPK in organic form for plant growth. Being totally botanical product it contains 100% natural NPK content and other essential micro nutrients. It gives 15 to 25% better yield than any other fertilizer. Conventional fertilizer lack of the uniformity of nutrient release that inhibit the constant growth of fruit crop. Neem cake also control nematodes and other soil borne disease pest that help roots absorb nutrients in regular and optimum manner. This is reason why now more farmers are switching over to neem cake also for their crops. Requirements and higher yield of crops. The combination of organic and inorganic fertilizer is important to maintain the soil health and increased the nutrient use efficiency and crop sustainability conjoint use of fertilizers and organic source of nutrients consume great important to sustained productivity. The use of organic source minimized the usage of chemical fertilizer that are very expensive and also environmentally unfriendly, with a view the present investigation was undertake.

Materials and Methods

The field experiment was conducted during 2018-2019 at College of Agriculture, Latur. The experiment was laid out in a randomized block design with three replications and ten treatments. T_1- Absolute control, T_2- 100% RDF, T_3- 125% RDF, T_4 -150% RDF, T_5- 100% RDF +20 kg ha^{-1} $FeSO_4$, T_6- 100% RDF + 20 kg ha^{-1} $ZnSO_4$, T_7 – 100% RDF + FYM @ 5 t ha^{-1}, T_8- 75% RDF + Vermicompost @ 2.5 t ha^{-1}, T_9- 100% RDF + Neemcake @ 2.5 t ha^{-1} and T_{10} – 100% RDF + Tank silt @ 5 t ha^{-1} +FYM @ 2.5 t ha^{-1}. The Jwala variety of chilli was used for study. The soil was with pH (7.9), organic carbon content 0.52 percent, $CaCO_3$ content 6.4 percent and available NPK 132.9, 9.03 and 538 kg ha^{-1}, respectively and the tank silt was clay, alkaline (7.4) and calcareous (12.3%) in nature available NPK was 273, 23.5 and 445 kg ha^{-1} respectively. The total NPK percent in tank silt 0.65, 0.72 & 1.82, respectively whereas FYM (0.62, 0.2 & 0.5%), neem cake (2.0, 1.0 & 1.0%) and vermicompost (1.12, 1.2 & 1.5%). Recommended dose of fertilizers (100:50:50 kg ha^{-1}) through urea, single super phosphate and murate of potash and organic manures through FYM, tank silt, vermicompost and neemcake. The growth observation was recorded at 30, 60 and 90 DAT. Soil quality and quality of chilly were determined as per standard procedure.

Results and Discussion

Effect of organic and inorganic fertilizers on growth of chilli

Plant height: The results pertaining to plant height of chilli as influenced by the organic and inorganic fertilizers recorded during three growth stages 40, 60 and 80 DAT are presented in table 1. The highest plant height was observed in treatment T_{10} (100% RDF +Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1}) at three growth stages 40 DAT (26.77 cm), 60 DAT (41.52 cm) and 80 DAT (72.27 cm) and at par with treatment T_7 (100% RDF+ FYM @ 5 t ha^{-1}) and which was significantly superior over rest of the treatment. The lowest plant height was at 40 DAT (21.60 cm), 60 DAT (31.90 cm) and 80 DAT (51.58 cm) in treatment T_1 (absolute control). The maximum plant height was observed in combination of both organic and inorganic fertilizers might be due to the quick availability of nutrients especially nitrogen the chief nutrient of protein for the formation of protoplasm which leads to cell division and cell enlargement similar result were found by Chatoo *et al.* (2011) [6] that the interaction effect of organic and inorganic fertilizers could be attributed the growth of the plant. Appireddy *et al.* (2008) [3] reported that application of FYM @ 10 t ha^{-1} + 100: 22: 41.5 NPK kg ha^{-1} showed the better significance of plant height (54.40 cm).

Table 1: Plant height as influenced by organic and inorganic fertilizers application in chilli

Treatments	Plant height (cm)		
	40 DAT	60 DAT	80 DAT
T_1- Control	21.60	31.90	51.58
T_2- 100% RDF (100: 50: 50 NPK kg ha^{-1})	22.53	33.67	52.31
T_3- 125% RDF	22.85	34.10	56.02
T_4- 150% RDF	22.23	34.87	58.73
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	23.23	35.03	63.63
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	23.16	34.33	65.53
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	24.33	37.67	70.67
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	23.24	35.96	68.41
T_9- 100% RDF + Neemcake @ 2.5 t ha^{-1}	23.13	33.20	66.53
T_{10}- 100% RDF + Tank silt @ 5t ha^{-1} +FYM @ 2.5 t ha^{-1}	26.77	41.52	72.27
Mean	24.09	35.22	55.72
S.E.(m)±	1.204	1.513	2.942
C.D at 5%	3.578	4.496	6.821

Number of Branches per plant

The results with regards to number of branches per plant of chilli recorded at different growth stages are presented in table 2. The maximum number of branches at different growth stages *viz.* 40 DAT (6.63), 60 DAT (18.50) and 80 DAT (21.25) was recorded in the treatment T_{10} (100% RDF+ Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1}) and it was at par with treatment T_7 (100% RDF +.5 t ha^{-1} FYM) and significantly superior over rest of the treatments. The minimum number of branches at 40 DAT (4.47), 60 DAT (6.39) and 80 DAT (7.98) were recorded in T_1 (control).

The combination of organic and inorganic fertilizer was increases the growth and development of the plant this may be due to increase the vegetative growth of the plant cell division and symbiotic activity among the all organism which influence play important role in growth of plant similar finding was observed by the Math *et al.* (2013) [14]. Kumari *et al.* (2009) [13] reported that application of organic and inorganic fertilizer improves the vegetative growth of plant.

Table 2: Number of branches per plant as influenced by organic and inorganic fertilizers in chilli

Treatment	Number of branches		
	40 DAT	60 DAT	80 DAT
T_1- Control	4.47	6.39	7.98
T_2- 100% RDF (100: 50: 50 NPK kg ha^{-1})	4.80	6.67	8.13
T_3- 125% RDF	4.53	9.56	9.88
T_4- 150% RDF	4.70	9.78	10.69
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	5.30	10.20	12.87
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	5.40	17.25	20.95
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	6.13	15.90	18.78
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	5.67	16.25	17.20
T_9- 100% RDF + Neemcake @ 2.5 t ha^{-1}	4.65	9.67	10.67
T_{10}- 100% RDF + Tank silt @ 5 t ha^{-1}+FYM @ 2.5 t ha^{-1}	6.63	18.50	21.25
Mean	4.99	12.01	13.74
S.E.(m)±	0.379	0.499	0.546
C.D at 5%	1.127	1.534	1.639

Effect of organic and inorganic fertilizers on yield and yield attributes in chilli

Number of fruits per plant

The data on number of fruits per plant are presented in table 3. The maximum number of fruits (50.86) was recorded in treatment T_{10} (100% RDF+Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1}) followed by the treatment T_7 (100% RDF+ FYM @ 5 t ha^{-1}) and T_8 (75% RDF + Vermicompost @ 2.5 t ha^{-1}). The minimum number of fruits (36.13) was recorded in treatment T_1 (control). Kadam *et al.* (2016) [10] reported that with the application of Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF highest maximum number of fruits (6.33).

Table 3: Yield attributes and yield as influenced by organic and inorganic fertilizers application in chilli

Treatments	Number of fruits per plant	Fruit length (cm)	Fruit weight (g)	Yield (q ha^{-1})
T_1- Control	36.13	5.17	56.90	58.00
T_2- 100% RDF (100: 50: 50) NPK kg ha^{-1})	39.86	7.75	66.83	68.15
T_3- 125% RDF	40.36	7.02	69.83	75.72
T_4- 150% RDF	41.90	6.44	75.49	78.17
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	41.34	7.20	78.20	78.19
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	43.79	9.15	83.87	79.74
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	46.64	11.13	116.57	87.88
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	46.12	9.22	112.13	85.72
T_9- 100% RDF + Neemcake @ 2.5 t ha^{-1}	42.43	8.06	85.79	77.29
T_{10}- 100% RDF + Tank silt @ 5t ha^{-1}+FYM @ 2.5 t ha^{-1}	50.86	12.22	120.59	88.40
Mean	42.94	8.33	90.05	74.16
S.E.(m)±	2.250	1.149	4.720	3.618
C.D at 5%	6.78	3.416	13.756	10.752

Fruit length (cm)

The data with regards to length of fruits influenced by the organic and inorganic fertilizers presented in table 3 indicated that highest length (12.22cm) was recorded in treatment T_{10} (100% RDF+Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1}) compared with other treatment and was at par with treatment T_6 (100% RDF + 20 kg ha^{-1} $ZnSO_4$), T_7 (100% RDF + FYM @ 5 t ha^{-1}) and T_8 (75% RDF + Vermicompost @ 2.5 t ha^{-1}) while it was significant with rest of the treatments. The lowest fruit length (5.17 cm) was recorded in the treatment T_1 (absolute control). The reason of maximum fruit length might be due to increased the production of leaves, ultimately in photosynthesis, higher amount of carbohydrates production and translocation from source (leaves) to sink (reproductive parts) resulted increase in fruit length observed by the Rehman *et al*. (2015) [21].

Fruit weight (g)

There was significant influence of organic manure and inorganic fertilizes on fruit weight presented in table 3 indicated that maximum fruit weight (120.59) was recorded in treatment T_{10} (100% RDF + Tank silt @ 5t ha^{-1} + FYM @ 2.5 t ha^{-1}) and was at par with treatment T_7 (100% RDF+ FYM @ 5t ha^{-1}) and T_8 (75% RDF + Vermicompost @ 2.5 t ha^{-1}) while it was significantly superior over rest of treatments. The minimum weight of fruit (56.90 g) was recorded in the treatment T_1 (control). Increase the fruit weight with increases the organic and inorganic nutrients in an integrated manner these possible might be due to the higher translocation was possible perhaps due to better sink capacity as indicated by the higher number of fruits and weight of fruits per plant the results are in accordance with the findings of Reddy *et al.* (2017) [20].

Yield (q/ha)

The data on yield quintal per hector of chilli was influenced by different treatment and presented in table 3.The maximum yield (88.40 q ha^{-1}) was observed in treatment T_{10} (100% RDF+Tank silt @ 5t ha^{-1} + FYM @ 2.5 t ha^{-1}) and was at par with T_7 (100% RDF+ FYM @ 5t ha^{-1}) which was significantly superior over the other treatment. Kadam *et al.* (2017) [11] reported that application of Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF maximum fruit yield (102.29 q ha^{-1}) similar observations were noticed by Osman (2007) [17] studied on tank silt application and observed that yield of cotton 40 per cent increase over control.

Barekar *et al.* (2000) [5] reported that observed that application of organic and inorganic fertilizer combination gave maximum yield (96.60 q ha^{-1}) in chilli. Similar observation was also reported by Kadam *et al*. 2016; Patil *et al*. 2017; Vaidya and Dhawan (2015) [10, 18, 24].

Effect of organic and inorganic fertilizers application on concentration and uptake of N, P, K,Fe and Zn in chilli.

Concentration and uptake of nitrogen

The data on concentration and uptake of nitrogen as influenced by the organic and inorganic fertilizers after harvest of chilli are presented in table 4. The total nitrogen concentration in fruit of chilli ranged from 1.22 to 1.98 per cent and in plant ranged from 1.12 to 1.40 per cent. The maximum nitrogen concentration of plant and fruit (1.40 and 1.98% respectively) was found in treatment T_{10} (100% RDF +Tank silt @ 5t ha^{-1} + FYM @ 2.5 t ha^{-1}) and which was at par with treatment T_7 (100% RDF+2.5 t ha^{-1} FYM). The minimum nitrogen concentration of plant and fruit 1.12 and 1.22 per cent respectively in treatment T_1 (control). The increasing concentration of nitrogen in plant and fruit were observed with the application of organic and inorganic fertilizers might be due to chelating effect on organic matter resulting enhanced nutrient supply. The results are in conformity with finding of Singh *et al.* (1997). The highest uptake of nitrogen (95.26 kg ha^{-1}) was found in treatment T_{10} (100% RDF+Tank silt @ 5t ha^{-1} + FYM @ 2.5 t ha^{-1}) which was at par with treatment T_7 (100% RDF + FYM @ 5 t ha^{-1}) lowest total N uptake (27.15 kg ha^{-1}) was noticed in treatment T_1 (control).

Table 4: Total nitrogen content and uptake as influenced by organic and inorganic fertilizers application in chilli.

Treatment	Plant		Fruit		Total N uptake (kg ha^{-1})
	Content (%)	Uptake (kg ha^{-1})	Content (%)	Uptake (kg ha^{-1})	
T_1- Control	1.12	14.87	1.22	12.28	27.15
T_2- 100% RDF (100:50: 50 NPK kg ha^{-1})	1.17	18.44	1.25	11.70	30.14
T_3- 125% RDF	1.26	31.12	1.26	23.30	54.42
T_4- 150% RDF	1.26	33.40	1.25	27.93	61.33
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	1.27	35.05	1.31	29.93	64.98
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	1.28	40.33	1.28	30.94	71.27
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	1.31	50.00	1.44	32.20	82.20
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	1.30	49.17	1.34	40.91	90.08
T_9- 100% RDF + Neemcake @ 2.5t ha^{-1}	1.25	38.40	1.25	30.00	68.00
T_{10}- 100% RDF + Tank silt @ 5t ha^{-1}+FYM @ 2.5 t ha^{-1}	1.40	52.34	1.98	42.92	95.26
Mean	1.264	33.84	1.364	25.18	59.02
S.E.(m)±	0.030	0.978	0.099	0.732	1.71
C.D at 5%	0.090	2.933	0.228	2.193	5.126

Kadam *et al.* (2017) [11] reported that application of Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1} + RDF significantly superior over the rest of the treatment in okra. The application of tank silt in combination with FYM along with RDF improves the soil moisture, yield and uptake of okra as compared to its alone application. Similar observation was noticed by Patil *et al.* (2017) [18] in Soybean crop. Prabhu *et al.* (2004) [19] studied on uptake in combination of organic and inorganic fertilizers in brinjal and reported that maximum N uptake at flowering stage (30.67 and 42.06 kg ha^{-1}). Mohan Kumar *et al*. (2011) [15] observed that maximum improvement of uptake of nutrient of soil after addition of farm yard manure along with mineral fertilizers due to organic manure supply the nutrient and proliferous root system developed under balanced nutrient application resulting better uptake along with improved physical environment.

Concentration and uptake of phosphorus

The data on concentration and uptake of phosphrous recorded at harvest are presented in table 5. The phosphrous concentration in fruit of chilli varies from 1.37 to 3.37 per cent and in plant it was ranged from 0.17 to 0.40 per cent. The maximum phosphrous concentration in plant and fruit (0.40% and 3.37%) was found in treatment T_{10} (100% RDF+Tank silt @ 5t ha^{-1}+ FYM @ 2.5 t ha^{-1}) which was superior over rest of the treatments. The minimum in phosphrous concentration in plant and fruit (0.17% and 1.37%) was recorded in treatment T_1 (control). The total phosphrous uptake (36.28 kg ha^{-1}) was found maximum in treatment T_{10} (100% RDF+ Tank silt @ 5 t ha^{-1} +FYM @ 2.5 t ha^{-1}) and at par with treatment T_7 (100% RDF+2.5 t ha^{-1} FYM). The minimum P uptake (20.00 kg ha^{-1}) was found in treatment T_1 (control). The increases in phosphrous uptake with increase fertilizer and FYM levels observed the highest uptake of P might be due to FYM showed superiority of organic carbon and release the nutrient slowly in to the system result influenced on enhancement of P uptake with increases in permeability of root cell and proliferation of root hairs this was agreed with Math *et al*. (2013) [14] in brinjal. Subbaiah *et al*. (1992) reported that the solubilization effect of plant nutrients by the addition of FYM leading to increased uptake of NPK. Similar results were reported by Chetri *et al*. (2012) [7] in chilli.

Table 5: Total phosphorus content and uptake as influenced by organic and inorganic fertilizers application in chilli

Treatment	Plant		Fruit		Total P uptake (kg ha^{-1})
	Content (%)	Uptake (kg ha^{-1})	Content (%)	Uptake (kg ha^{-1})	
T_1- Control	0.17	13.00	1.37	7.00	20.00
T_2- 100% RDF (100: 50: 50 NPK kg ha^{-1})	0.19	15.68	1.70	8.33	24.01
T_3- 125% RDF	0.27	18.67	2.10	9.02	27.87
T_4- 150% RDF	0.25	19.00	2.07	10.79	29.79
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	0.28	19.70	2.27	11.45	31.15
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	0.40	19.87	2.89	11.67	31.54
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	0.35	20.33	3.13	13.33	33.66
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	0.29	19.93	3.07	12.00	31.93
T_9- 100% RDF + Neemcake @ 2.5 t ha^{-1}	0.24	16.67	2.12	9.33	26.00
T_{10}- 100% RDF + Tank silt @ 5t ha^{-1} +FYM @ 2.5 t ha^{-1}	0.40	21.95	3.37	14.33	36.28
Mean	0.29	18.32	2.35	10.64	28.96
S.E.(m)±	0.007	0.605	0.005	0.345	0.99
C.D at 5%	0.024	1.915	0.017	1.040	3.849

Concentration and uptake of potassium

The data on concentration and uptake of K as influenced by organic and inorganic fertilizer recorded at harvest of chilli are presented in table 6 indicated that the K concentration was ranged from 2.37 to 7.91 per cent in fruit and 2.46 to 3.83 per cent in plant of chilli. The maximum K concentration was observed in treatment T_{10} (100% RDF+Tank silt @ 5 t ha^{-1} +FYM @ 2.5 t ha^{-1}) and minimum K concentration in fruit and plant was noted in treatment T_1 (control).The maximum total uptake of K (181.34. kg ha^{-1}) was found in treatment T_{10} (100% RDF + Tank silt @ 5 t ha^{-1} + FYM @ 2.5 t ha^{-1}) and at par with treatment T_7 (100% RDF + FYM @ 5t ha^{-1}) and significantly superior over rest of the treatment. The lowest K uptake (92.33 kg/ha) was in treatment T_1 (control). These

finding are closely related with Hari *et al.* (2007) [8] reported that beneficial effect of FYM on available potassium fixation and release of potassium due to the interaction of organic matter with K, besides direct K addition in the available pool in the soil. Acharya *et al.* (1998) [2] studied on the uptake of K in tomato and reported that the application of K along with FYM increased K uptake.

Table 6: Total potassium content and uptake as influenced the organic and inorganic fertilizers application in chilli

Treatment	Plant		Fruit		Total K uptake (kg ha^{-1})
	Content (%)	Uptake (kg ha^{-1})	Content (%)	Uptake (kg ha^{-1})	
T_1- Control	2.46	50.00	2.37	44.35	92.33
T_2- 100% RDF (100: 50: 50) NPK kg ha^{-1})	2.97	63.00	2.65	60.67	121.67
T_3- 125% RDF	2.59	76.67	2.96	62.00	135.67
T_4- 150% RDF	3.61	80.67	3.74	63.20	146.00
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	3.66	86.68	4.14	65.33	152.00
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	2.93	89.33	4.82	72.33	161.66
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	3.66	93.00	5.38	82.67	175.67
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	3.61	89.33	5.15	76.67	164.00
T_9- 100% RDF + Neemcake @2.5t ha^{-1}	3.30	66.34	3.70	62.67	129.01
T_{10}- 100% RDF + Tank silt @ 5t ha^{-1}+FYM @ 2.5 t ha^{-1}	3.83	96.34	7.91	85.00	181.34
Mean	3.329	76.901	4.220	73.756	143.48
S.E.(m)±	0.306	2.191	0.458	3.351	6.442
C.D at 5%	0.911	5.567	1.560	6.799	15.615

Concentration and uptake of Zinc

The data on concentration and uptake of Zn as influenced by organic and inorganic fertilizer recorded at harvest of chilli are presented in table 7 indicated that the Zn concentration was ranged from 35.33 to 42.41 mg kg^{-1} in fruit and 15.14 to 30.00 mg kg^{-1} in plant of chilli. The maximum uptake and content of Zn was found in treatment T_6 (100% RDF + 20 Kg ha^{-1} $ZnSO_4$) followed by T_7 (100% RDF + FYM @ 5 t ha^{-1}). The maximum content and uptake of Zn in treatment receiving $ZnSO_4$. Mohan Kumar *et al.* (2011) [15] observed that maximum improvement of uptake of nutrient of soil after addition of farm yard manure along with mineral fertilizers due to organic manure supply the nutrient and proliferous root system developed under balanced nutrient application resulting better uptake along with improved physical environment.

Table 7: Total Zinc content and uptake as influenced by the organic and inorganic fertilizers application in chilli.

Treatment	Plant		Fruit		Total ZN uptake (g ha^{-1})
	Content mg kg^{-1}	Uptake (g ha^{-1})	Content mg kg^{-1}	Uptake (g ha^{-1})	
T_1- Control	15.14	339.04	35.33	566.15	905.48
T_2- 100% RDF (100: 50: 50) NPK kg ha^{-1}	19.00	402.05	36.33	600.14	1002.19
T_3- 125% RDF	21.48	471.21	37.66	606.15	1077.36
T_4- 150% RDF	22.28	524.14	38.48	606.16	1130.33
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	26.33	600.07	38.88	668.04	1268.11
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	30.00	680.00	42.41	707.18	1387.18
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	28.66	648.10	42.00	673.16	1321.32
T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	24.66	530.07	41.88	625.11	1155.18
T_9- 100% RDF + Neemcake @2.5 t ha^{-1}	20.66	512.14	36.58	600.16	1118.30
T_{10}- 100% RDF + Tank silt @ 5 t ha^{-1}+FYM @ 2.5 t ha^{-1}	22.33	534.89	39.33	622.11	1152.18
Mean	19.78	536.75	39.18	627.43	1160.12
S.E.(m)±	1.26	3.13	1.48	2.13	4.25
C.D at 5%	3.77	9.37	4.41	6.17	13.70

Concentration and uptake of Iron

The data on concentration and uptake of Fe as influenced by organic and inorganic fertilizer recorded at harvest of chilli are presented in table 4.13. Indicated that the Fe uptake was ranged from 117.30 to 229.77 mg kg^{-1} in fruit and 29.39 to 35.17 mg kg^{-1} in plant of chilli. The high content and uptake of Fe was recorded in treatment T_5 (100% RDF + $ZnSO_4$ @ 20 kg ha^{-1}) receiving $ZnSO_4$ followed by treatment T_7 (100% RDF + FYM 5 t ha^{-1}).

Table 8: Total Fe content and uptake as influenced by the organic and inorganic fertilizers application in chilli

Treatment	Plant		Fruit		Total Fe uptake (g ha^{-1})
	Content mg kg^{-1}	Uptake (g ha^{-1})	Content kg^{-1}	Uptake (g ha^{-1})	
T_1- Control	29.39	224.83	4.45	117.30	402.13
T_2- 100% RDF (100: 50: 50) NPK kg ha^{-1}	29.74	316.76	5.00	133.74	430.5
T_3- 125% RDF	30.63	332.18	6.00	148.21	480.39
T_4- 150% RDF	31.42	372.02	6.80	163.93	535.95
T_5- 100% RDF+20 kg ha^{-1} $FeSO_4$	35.17	474.87	7.90	229.77	704.64
T_6- 100% RDF+20 kg ha^{-1} $ZnSO_4$	31.71	381.24	7.00	169.31	550.55
T_7- 100% RDF+ FYM @ 5 t ha^{-1}	34.21	431.71	7.67	194.08	626.39

T_8- 75% RDF+ Vermicompost @ 2.5 t ha^{-1}	35.99	394.49	7.50	189.84	584.33
T_9- 100% RDF + Neemcake @ 2.5t ha^{-1}	30.71	356.92	6.30	152.13	509.08
T_{10}- 100% RDF + Tank silt @ 5t ha^{-1}+FYM @ 2.5 t ha^{-1}	30.78	369.91	6.40	160.13	530.4
Mean	31.67	371.49	6.50	140.8	537.43
S.E.(m)±	1.151	5.50	0.009	2.13	3.69
C D at 5%	3.45	16.23	0.228	6.39	9.72

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